DRAFT

Los Angeles Department of Water and Power 2015 Annual Owens Valley Report

- Annual Owens Valley Operations Plan for the 2015-16 Runoff Year
- Conditions in the Owens Valley
- Enhancement and Mitigation Project Status
- 1991 Environmental Impact Report
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- Status of Other Studies, Projects, and Activities

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

This report includes Los Angeles Department of Water and Power's (LADWP) proposed Owens Valley operations plan for the first six months of the 2015-16 runoff year, an update on Owens Valley conditions, the current status of LADWP's environmental mitigation projects, and the status of other studies, projects, and activities.

Preface

LADWP will not export any water from the Owens Valley into Los Angeles during the first half of the 2015-16 runoff year, and mostly likely not until November 2015. For the entire runoff year only 42,400 acre-feet (AF) will be exported. However, a net of amount of 32,200 AF from the aqueduct system will be sent to Los Angeles, including a reduction of 10,200 AF of aqueduct storage. This will be the lowest amount by far of water delivered to Los Angeles from the Owens Valley.

This extremely low amount of water deliveries is due to the fact that the Eastern Sierra is experiencing the fourth consecutive year of extreme drought. The April 1, 2015, snowpack was measured to be 4% of normal, certainly the lowest by far on record. The resulting estimated runoff forecast for the first six months of this year is 25% of normal. Runoff is estimated to be approximately 36% for the entire runoff year assuming normal precipitation in the summer, fall, and winter months. This will shatter the lowest years on record by far. Last year, 2014-15, the 52% of normal runoff matched the previous lowest year on record.

Contributing to the extremely low runoff this year is that the three previous years had runoffs of 57%, 54%, and 52% of normal, respectively. These were the lowest three consecutive years on record, and now with this year will be the four lowest consecutive years on record. This puts Owens Valley water uses and supply for Los Angeles into uncharted territory for water availability. The total Eastern Sierra Owens Valley supply of water this year will be only 276,000 AF as compared to 541,000 AF for an average year as shown in Table ES.1

Table ES.1 Owens Valley Water Supply

Owens Valley Water Supply	Post Agreement Average (acre-feet)	2014-15 Runoff Year	2015-16 Runoff Year
Mono Basin & Long Valley Supply to Owens Valley	148,000	10,000	70,000
Owens Valley Runoff & Groundwater	393,000	255,000	206,000
Total Water Supply	541,000	265,000	276,000

Because runoff this year is so far below any year experienced to date, and due to the previous three years of drought, there will be a significant challenge to meet water obligations. In such a dire situation, LADWP encourages continued efficient use of water for all purposes in the Owens Valley and in Los Angeles.

LADWP will monitor water uses on City lands to balance land management needs and to maintain water flows in creeks. LADWP has informed Lessees who use surface water from creeks to maintain sufficient flows downstream of their diversions to sustain existing aquatic resources and informed Lessees who depend upon wells for irrigation that pumping volumes may be decreased to avoid impacting private wells or if it is anticipated that groundwater pumping may cause adverse environmental impacts.

The first six month 2015-16 runoff year Owens Valley Operations Plan has been prepared to supply key water uses for the Owens Valley including Enhancement/Mitigation, LORP, Additional Mitigation Projects developed by the MOU Ad Hoc Group (1,600 Acre-Feet Projects), Native American Indian Lands, Owens Lake Dust Mitigation, Recreation, and Stockwater. Unfortunately though, with the extreme lack of water, there is significantly less water available for irrigation as shown in Table ES.2.

Table ES.2 Owens Valley Water Use

Owens Valley Uses	Typical Year	2014-15 Runoff Year	2015-16 Runoff Year
Irrigation	49,000	43,500	16,500
Stockwater	11,500	11,500	10,200
E&M	10,000	9,500	9,500
Recreation	9,000	7,400	7,400
Owens Lake	75,000	53,700	60,700
LORP	18,600	14,300	15,300
1,600 acre-feet	1,600	1,600	1,600
Indian Lands	3,200	3,200	3,200

Despite the large reductions to irrigation, no water will be available for transport within the Los Angeles Aqueduct south of the Owens Lake until November of 2015. Only when the Owens Valley uses have subsided from the summer season is any water left over for transport to Haiwee Reservoir. In November, outflow from Pleasant Valley Reservoir and downstream creeks flowing into the Owens River and the Los Angeles Aqueduct will finally exceed Owens Valley water use demands. Water will then be available for delivery to Haiwee Reservoir. Exports to Los Angeles before November of 2015 will be drawn from existing storage in Haiwee Reservoir. For the entire runoff year only 42,400 acre-feet (AF) will be exported. However, a net amount of 32,200 AF from the aqueduct system will be sent to Los Angeles, accounting for a reduction of 10,200

AF of aqueduct storage as shown in Table ES.3. This will be the lowest amount by far of water delivered to Los Angeles from the Owens Valley.

Table ES.3 Anticipated Los Angeles Aqueduct Storage and Delivery in 2015-16 Runoff Year

Period	Owens Valley-Bouquet Reservoir Storage Change (acre-feet)	Aqueduct Deliver to Los Anges (acre-feet)
April to October	-35,700	13,000
November to March	25,500	29,400
Sub-total	-10,200	42,400
Net Export to Los Angeles		32,200

Owens Valley Annual Operations Plan Summary

For the period of April 1, 2015, to March 31, 2016, the forecast Eastern Sierra runoff for the Owens River Basin is 148,600 acre-feet or 36% of normal. This is the lowest forecasted Owens Valley runoff for the period of record. Forecast of Eastern Sierra runoff between April 1, 2015, and September 30, 2015, is 76,000 acre-feet or 25% of normal. Average year April through September runoff is 303,903 acre-feet.

Pursuant to Water Agreement Section V.D:

> *By April 20th of each year, the Department shall prepare and submit to the Inyo County Technical Group a proposed operations plan and pumping program for the twelve (12) month period beginning on April 1st. (In the event of two consecutive dry years when actual and forecasted Owens Valley runoff for the April to September period is below normal and averages less than 75 percent of normal, the Department shall prepare a proposed plan for the six (6) month period beginning on April 1st and October 1st, and submit such plans by April 20th and October 20th.)*

Accordingly, LADWP has prepared a proposed six month operations plan and pumping program for the period beginning April 1, 2015.

LADWP groundwater pumping in the Owens Valley is governed by the ON/OFF provisions of the *1991 Agreement between the County of Inyo and the City of Los Angeles and its Department of Water and Power on a Long Term Groundwater Management Plan for Owens Valley and Inyo County* (Water Agreement). According to the well ON/OFF provisions of the Water Agreement, approximately 128,765 acre-feet of water is available for groundwater pumping from Owens Valley well fields. In addition to the ON/OFF provisions of the Water Agreement, LADWP considers Owens Valley conditions, projected runoff, and operational practicalities when determining its planned pumping. LADWP's groundwater pumping for the first six months of the 2015-16 runoff year is planned to range between 36,250 and 49,020 acre-feet, contingent on environmental conditions and water needs. The lower end of this range is commensurate with non-discretionary pumping requirements including fish hatchery supply, town supply, irrigation, and other required uses. The upper range is in keeping with dry year conservative pumping plans supported by the Inyo County/Los Angeles Standing Committee during the drought recovery period of the early 1990s. For the entire 2015-16 runoff year, LADWP anticipates total pumping to be in the range of approximately 70,000 AF.

Owens Valley Conditions

Forecast runoff to the Owens River Basin during the 2015-16 runoff year is 148,600 acre-feet or 36% of normal. The overall Eastern Sierra snowpack in watersheds contributing to the Los Angeles Aqueduct (LAA) was estimated to be 4% of normal as of April 1, 2015. Precipitation on the Owens Valley floor during the 2014-15 runoff year averaged 2.91 inches and was below the long-term average of 5.9 inches. Owens Valley groundwater levels are relatively stable in most areas.

During the 2014-15 runoff year, the Lower Owens River was in full operational status with a minimum average flows of 40 cubic feet per second (cfs) or greater as measured at all gauging stations. The total water use by the Lower Owens River, the Delta, Blackrock Waterfowl Management Area, and other Lower Owens River Project (LORP) uses were approximately 14,300 acre-feet for the year. The releases at the Los Angeles Aqueduct (LAA) intake were augmented by additional releases at selected LAA spill gates to maintain an average continuous flow of at least 40 cfs in the river channel.

Construction for the Owens Lake Dust Mitigation Program (OLDMP) continued during the 2014-15 runoff year. Phase 7a of OLDMP is expected to complete in July 2015. Dust mitigation activities on Owens Lake consumed 53,700 acre-feet of water in 2014-15. OLDMP water uses during the 2015-16 runoff year are anticipated to be 60,700 acre-feet.

Enhancement/Mitigation Project Status

The enhancement/mitigation projects discussed in Section 4 were identified in the *1991 Environmental Impact Report on Water From the Owens Valley to Supply the Second Los Angeles Aqueduct* (1991 EIR) as mitigation for impacts due to LADWP's water gathering activities. There are 26 projects identified as enhancement/mitigation measures; all 26 of these projects have been fully implemented. Four of these projects are complete with no additional action needed, and 22 are implemented and ongoing, meaning that they are fully operational with ongoing water commitments or monitoring and reporting requirements. Refer to Section 4 for more information.

1991 EIR Mitigation Project Status

There are 53 mitigation projects identified for environmental impacts in the 1991 EIR. One of these projects is complete with no additional action needed and 44 are implemented and ongoing, meaning that they are fully operational and are attaining goals but have ongoing water commitments or additional monitoring and reporting requirements. One additional project is fully implemented but is not currently attaining goals, and 7 are in progress. Refer to Section 5 for more information.

Status of Other Mitigation Projects

Implementation status of provisions in the Inyo/Los Angeles Water Agreement (Water Agreement) and the *1997 Memorandum of Understanding between the City of Los Angeles Department of Water and Power, the County of Inyo, California Department of Fish and Game, the California State Lands Commission, the Sierra Club, and the Owens Valley Committee* (1997 MOU) have also been updated. Refer to Section 7 for more information.

Inyo County and LADWP continue to jointly work toward the completion of the Green Book revisions. Status updates of the Green Book revision effort are given at Technical Group and Standing Committee meetings.

1. INTRODUCTION

This document is intended to satisfy the Los Angeles Department of Water and Power's (LADWP) annual reporting obligations pursuant to the *Agreement between the County of Inyo and the City of Los Angeles and its Department of Water and Power on a Long Term Groundwater Management Plan for Owens Valley and Inyo County* (Water Agreement); *the 1991 Environmental Impact Report Water from the Owens Valley to Supply the Second Los Angeles Aqueduct, 1970 to 1990, 1990 Onward, Pursuant to a Long Term Groundwater Management Plan* (1991 EIR); the Laws Type E transfer; the *1997 Memorandum of Understanding between the City of Los Angeles Department of Water and Power, County of Inyo, the California Department of Fish and Game, the California State Lands Commission, the Sierra Club, and the Owens Valley Committee* (1997 MOU); and the *August 2004 Amended Stipulation and Order in Case No. S1CVCV01-29768* (Stip/Order).

1.1 Water Agreement

The Water Agreement requires periodic evaluations of enhancement/mitigation projects to be made by the Inyo County/Los Angeles Technical Group. As required by the Water Agreement, all existing enhancement/mitigation projects will continue unless the Inyo County Board of Supervisors and LADWP agree to modify or discontinue a project. Section 4 of this report provides an update on LADWP enhancement/mitigation project status.

1.2 Annual Operations Plan

The Water Agreement provides that "By April 20th of each year, the Department shall prepare and submit to the Inyo County Technical Group a proposed operations plan and pumping program for the twelve (12) month period beginning on April 1st. (In the event of two consecutive dry years when actual and forecast Owens Valley runoff for the April to September period is below normal and averages less than 75 percent of normal, the Department shall prepare a proposed plan for the six (6) month period beginning on April 1st and October 1st, and submit such plans by April 20th and October 20th). The proposed plan and pumping program and any subsequent modifications to it shall be consistent with these goals and principles.

1. A proposed plan shall include, but is not limited to, the following:

   - Owens Valley Runoff estimate (annual)

   - Projected groundwater production by wellfield (monthly)

   - Projected total aqueduct reservoir storage levels (monthly)

   - Projected aqueduct deliveries to Los Angeles (monthly)

- Projected water uses in the Owens Valley (monthly)

- Water balance projections at each monitoring site

2. The County through its Technical Group representatives shall review the Department's proposed plan of operations and provide comments to the Department within ten (10) days of receipt of the plan.

3. The Department shall meet with the County's Technical Group representatives within ten (10) days of the receipt of the County's comments, and attempt to resolve concerns of the County relating to the proposed pumping program.

4. The Department shall determine appropriate revisions to the plan, provide the revised plan to the County within ten (10) days after the meeting, and implement the plan.

5. The April 1st pumping program may be modified by the Department during the period covered by the plan to meet changing conditions. The Department shall notify the County's Technical Group representatives in advance of any planned significant modifications. The County shall have the opportunity to comment on any such modifications.

6. Information and records pertaining to the Department's operations and runoff conditions shall be reported to the County's Technical Group representatives throughout the year."

Section 2 of this report is LADWP's Operations Plan for the first six months of Runoff Year 2015-16.

1.3 1997 MOU

In accordance with the 1997 MOU Section III.H, LADWP and Inyo County are required to prepare an annual report describing environmental conditions in the Owens Valley and the associated studies, projects, and activities conducted under the Water Agreement and the 1997 MOU. Sections 3 through 7 of this report are intended to fulfill that requirement.

1.4 1991 EIR Monitoring Program

The 1991 EIR requires that LADWP submit an annual report to the Los Angeles Board of Water and Power Commissioners containing a description of each mitigation effort, its goals, strategies, and actions; its status (completed activities, ongoing activities); the overall effectiveness of each mitigation effort; and status of each mitigation plan for the following year. Section 5 of this report provides the required information.

Mitigation plans for each of the mitigation measures are developed by the Technical Group as set forth in Section I.C.2 of the Green Book, the technical appendix to the Water Agreement. The Green Book states: “as part of each mitigation plan, the Technical Group shall develop a reporting and monitoring program. At least once per year, the Technical Group shall report, in writing to the Standing Committee, on the effectiveness of the mitigation plan in achieving its goal.” Section 5 of this report is intended to complete that annual obligation.

1.5 2004 Amended Stipulation and Order

The Stip/Order, Section 11, requires that on or about May 1 of each year LADWP shall complete and release an annual report that is in conformance with Section III.H of the 1997 MOU. This report is intended to fulfill that requirement.

2. **OWENS VALLEY OPERATIONS PLAN FOR RUNOFF YEAR 2015-16**

2. OWENS VALLEY OPERATIONS PLAN FOR RUNOFF YEAR 2015-16

This year's annual operations plan and pumping program is consistent with the management strategy of the Water Agreement between the County of Inyo (County) and the City of Los Angeles (City) dated October 18, 1991. As stated in the Water Agreement:

> *The overall goal of managing the water resources within Inyo County is to avoid certain described decreases and changes in vegetation and to cause no significant effect on the environment which cannot be acceptably mitigated while providing a reliable supply of water for export to Los Angeles and for use in Inyo County.*

The overall goal of the Water Agreement: environmental protections and a reliable water supply are the basis of the Los Angeles Department of Water and Power's (LADWP) operations plans. Groundwater pumping in the Owens Valley is managed in conformance with the provisions of the Water Agreement. The Water Agreement provides:

> *By April 20th of each year, the Department shall prepare and submit to the Inyo County Technical Group a proposed operations plan and pumping program for the twelve (12) month period beginning on April 1st. (In the event of two consecutive dry years when actual and forecasted Owens Valley runoff for the April to September period is below normal and averages less than 75 percent of normal, the Department shall prepare a proposed plan for the six (6) month period beginning on April 1st and October 1st, and submit such plans by April 20th and October 20th.)*

2.1. Eastern Sierra Runoff Forecast

The Eastern Sierra Runoff Forecast for the 2015-16 runoff year (Table 2.1) is based on snow surveys of key Eastern Sierra watersheds in Inyo and Mono counties that contribute the majority of runoff water into the Owens Valley. The Eastern Sierra Runoff Forecast is used for planning aqueduct operations. The April 1 forecast Eastern Sierra runoff for 2015-16 runoff year is 148,600 acre-feet, or about 36% of the 1961-2010 long-term average annual runoff value of 412,284 acre-feet. This will be the driest year for the period of record and together with the low runoff during the last three years, the driest four year runoff period for the period of record in Owens Valley.

For the period of April 1 through September 30, 2014, Eastern Sierra runoff was approximately 143,320 acre-feet, or 47% of long term average value of 303,903 acre-feet. The forecast runoff for the period between April 1 through September 30, 2015, is 76,000 acre-feet for the Owens River Basin or 25% of the long-term average. To emphasize the lack of supply for the 2015 runoff season, only half of the supply will be available this year compared with last year, and last year was tied for the driest year on record.

Figure 2.1 summarizes Owens Valley runoff and groundwater pumping by LADWP since the 1971 runoff year. This figure portrays the extent of the current drought compared to the past runoff in Owens Valley.

Table 2. 1. Owens Valley Runoff Forecast for 2015-16 Runoff Year

2015 EASTERN SIERRA
RUNOFF FORECAST
April 1, 2015

APRIL THROUGH SEPTEMBER RUNOFF

	MOST PROBABLE VALUE (Acre-feet)	MOST PROBABLE VALUE (% of Avg.)	REASONABLE MAXIMUM (% of Avg.)	REASONABLE MINIMUM (% of Avg.)	LONG-TERM MEAN (1961 - 2010) (Acre-feet)
MONO BASIN:	**20,200**	**20%**	32%	7%	103,522
OWENS RIVER BASIN:	**76,000**	**25%**	38%	12%	303,903

APRIL THROUGH MARCH RUNOFF

	MOST PROBABLE VALUE (Acre-feet)	MOST PROBABLE VALUE (% of Avg.)	REASONABLE MAXIMUM (% of Avg.)	REASONABLE MINIMUM (% of Avg.)	LONG-TERM MEAN (1961 - 2010) (Acre-feet)
MONO BASIN:	**30,400**	**25%**	38%	12%	122,333
OWENS RIVER BASIN:	**148,600**	**36%**	49%	24%	412,284

NOTE - Owens River Basin includes Long, Round and Owens Valleys (not incl Laws Area)

MOST PROBABLE - That runoff which is expected if median precipitation occurs after the forecast date.

REASONABLE MAXIMUM - That runoff which is expected to occur if precipitation subsequent to the forecast is equal to the amount which is exceeded on the average once in 10 years.

REASONABLE MINIMUM - That runoff which is expected to occur if precipitation subsequent to the forecast is equal to the amount which is exceeded on the average 9 out of 10 years.

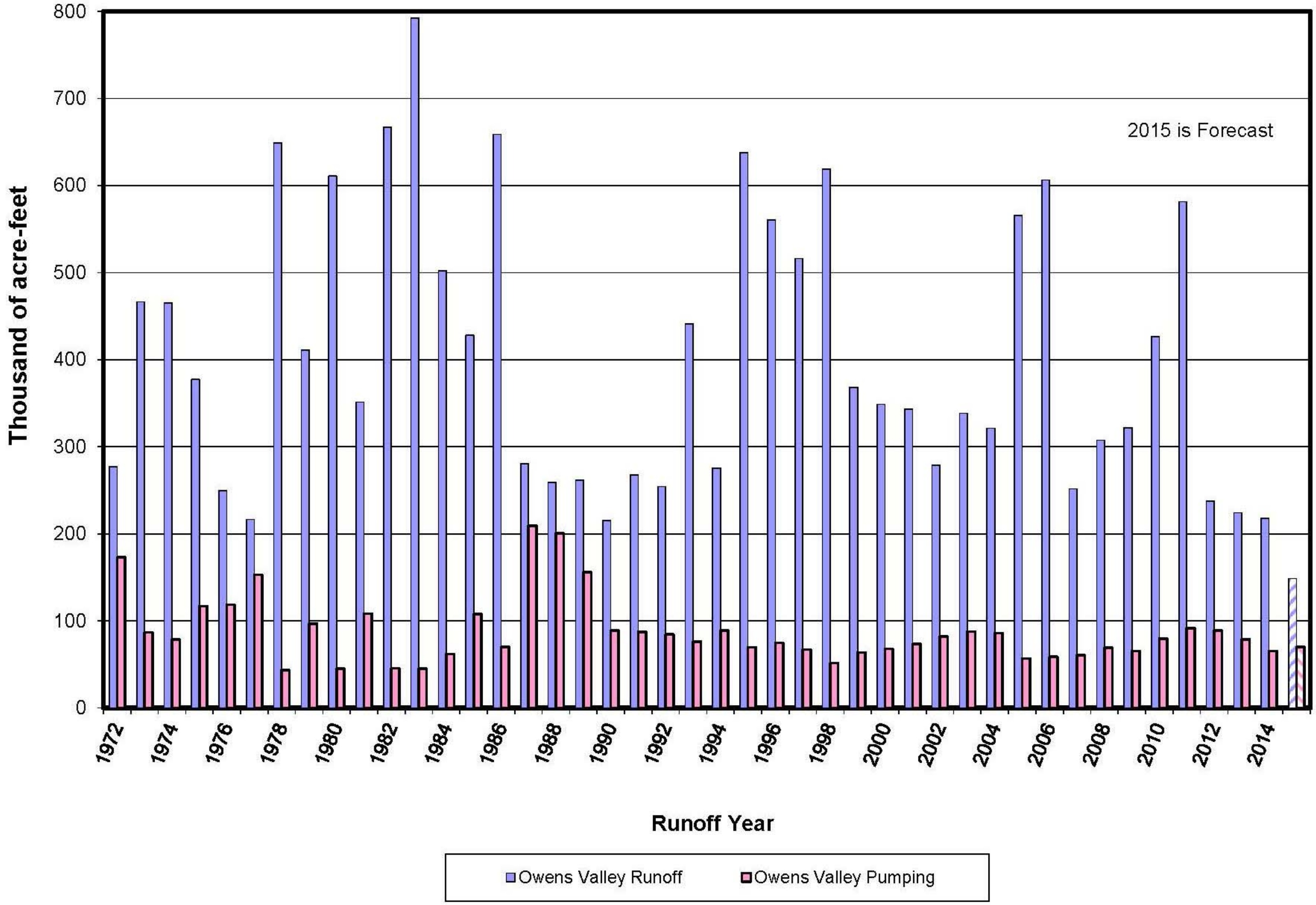

Figure 2. 1. Owens Valley Runoff and Groundwater Pumping

2.2. Owens Valley Groundwater Production

LADWP has prepared its 2015-16 Annual Owens Valley Operations Plan based on the goals and principles of the Water Agreement. The 2015-16 Annual Owens Valley Operations Plan is designed to avoid adverse impacts to the environment while providing a reliable supply of water for in-valley uses and export to Los Angeles for municipal use.

Under the terms of the Water Agreement, the acceptable amount of groundwater pumping from each Owens Valley wellfield is based on the ON/OFF status of monitoring sites located within each wellfield and the capacity of the wells linked to those sites (see Water Agreement Sections V.B and V.C). Table 2.2 lists the ON/OFF status of the monitoring sites within the Owens Valley as of April 2015. The Water Agreement or Technical Group has designated certain town supply wells, irrigation supply wells, fish hatchery supply wells, enhancement/mitigation (E/M) project supply wells, and other wells determined to not significantly impact areas with groundwater dependent vegetation as exempt from the ON/OFF provisions of the Water Agreement. These exempt wells may be pumped for their intended purpose.

Table 2.3 provides a breakdown of available annual pumping capacity and planned groundwater pumping for the first six months of the 2015-16 runoff year by wellfield. Pursuant to Water Agreement Section V.D, LADWP shall submit a plan for the second six months of the runoff year on or about October 20, 2015. Table 2.3 also shows the monitoring sites in ON status as of April 2015, the wells associated with the ON status monitoring sites, and the exempt wells in each wellfield. Approximately 128,300 acre-feet of water are available for groundwater pumping from Owens Valley wellfields under the terms of the Water Agreement during the 2015-16 runoff year. LADWP plans to pump between 36,250 and 49,020 acre-feet during the first six months of the 2015-16 runoff year. Groundwater pumping during the first six months of the 2015-16 runoff year will provide water for Owens Valley uses, while no water is planned to be delivered to Haiwee Reservoir for eventual delivery to the city during this period. For the entire 2015-16 runoff year, LADWP anticipates the total groundwater pumping to be in the range of approximately 70,000 acre-feet.

Working both independently and with the Inyo/Los Angeles Technical Group, LADWP will monitor Owens Valley environmental conditions to assess if further changes to the planned pumping are needed. LADWP's 2015-16 groundwater management approach is substantially more conservative than the environmentally conservative pumping plans advocated by the Standing Committee during the dry years of the early 1990s. While LADWP plans to pump considerably less groundwater than made available under Water Agreement Section V, the Inyo/Los Angeles Standing Committee may agree upon additional reductions in groundwater pumping pursuant to Water Agreement Section IV.A.

Figure 2.2 compares the amount of Owens Valley groundwater pumping provided by the provisions of Water Agreement and the actual groundwater pumping by LADWP for each runoff year since 1992 (available pumping was not calculated prior to 1992). LADWP's anticipated pumping for the 2015-16 runoff year is consistent with its past conservative pumping plans. LADWP is committed to conducting its operations in a conservative, responsible, and environmentally sustainable manner.

In addition to complying with the ON/OFF provisions and the environmental protection goals of the Water Agreement, LADWP's 2015-16 pumping program considers the groundwater mining provisions of the Green Book. Table 2.4 shows the latest update of the mining calculations based on the procedures described in Section IV.C of the Green Book. As shown in this table, none of the wellfields in the Owens Valley will be in deficit by the end of the first half of the 2015-16 runoff year.

Table 2.5 is a list of Owens Valley wells exempted under the Water Agreement or by approval of the Technical Group from linkage to vegetation monitoring sites and the ON/OFF provisions. The table includes a list of wells by well number, general location of the exempt well, and the reason the well is exempt.

Table 2.6 details planned groundwater pumping for the first six months of the 2015-16 runoff year on a month-to-month basis for each wellfield. Pumping for town water systems, fish hatcheries, and enhancement/mitigation (E/M) projects is included in the pumping distribution. Owens Valley groundwater production for the 2015-16 runoff year is consistent with the provisions of the Water Agreement. No additional testing of wells subject to the Water Agreement is included in this year's planned pumping total and if performed, will be in addition to the planned pumping for 2015-16. Planned pumping may be increased to provide freeze protection for the Los Angeles Aqueduct (LAA).

The following is a discussion of the planned pumping program by wellfield. Figures 2.3, 2.4, and 2.6 through 2.10 locate LADWP's Owens Valley pumping wells by wellfield. These figures show the location of production wells, monitoring wells, and vegetation monitoring sites in each area.

Table 2. 2. Soil/Vegetation Water Balance Calculations for April 2015 According to Section III of the Green Book

Site	Oct 2013 soil AWC	40% Annual Precip.	Proj. soil AWC	October 2013 Veg Water Req./ Water Req. for well turn-on	Oct 2013 Status	April 2014 soil AWC	April 2014 Status	Soil AWC req. for well turn-on
	(cm)	(cm)	(cm)	(cm)		(cm)		(cm)
L1	1.4	NA	1.4	2.9/15.6	OFF	3.3	OFF	15.6, OFF
L2	13.6	6.3	19.9	6.1/NA	ON	14.3	ON	NA
L3	7.8	NA	7.8	5.6/25.2	OFF	14.1	OFF	25.2, OFF
BP1	2.7	NA	2.7	4.6/22.9	OFF	3.6	OFF	22.9†, OFF
BP2	1.1	NA	1.1	8.6/28.4	OFF	3.0	OFF	28.4, OFF
BP3	2.9	NA	2.9	7.3/10.6	OFF	5.3	OFF	10.6, OFF
BP4	43.2	6.6	49.8	10.1/NA	ON	45.8	ON	NA
TA3	6.8	NA	6.8	12.9/26.0	OFF	8.5	OFF	26.0, OFF
TA4	14.0	NA	14.0	7.4/23.3	OFF	18.3	OFF	23.3, OFF
TA5	20.8	6.6	27.4	1.9/NA	ON	23.4	ON	NA
TA6	9.7	NA	9.7	7.7/17.6	OFF	11.1	OFF	17.6, OFF
TS1	1.8	NA	1.8	5.3/20.4	OFF	3.1	OFF	20.4†, OFF
TS2	8.0	5.8	13.8	4.9/NA	ON	10.3	ON	NA
TS3	21.7	NA	21.7	16.0/32.9	OFF	28.1	OFF	32.9, OFF
TS4	29.2	NA	29.2	37.0/55.9	OFF	39.8	OFF	55.9, OFF
IO1	21.0	NA	21.0	48.6/42.2	OFF	24.1	OFF	42.2, OFF
IO2	4.6	NA	4.6	4.0/18.9	OFF	4.1	OFF	18.9, OFF
SS1	19.3	5.2	24.5	12.4/NA	ON	18.6	ON	NA
SS2	4.1	NA	4.1	5.4/25.6	OFF	3.7	OFF	25.6, OFF
SS3	20.7	NA	20.7	10.6/33.8	OFF	20.7	OFF	33.8, OFF
SS4	4.2	NA	4.2	4.9/15.9	OFF	6.7	OFF	15.9, OFF
BG	25.3	5.3	30.6	3.7/NA	ON	23.8	ON	NA

†: These values of soil water required for well turn-on were derived using calculations based on %cover that were routinely performed in the past. The values have not been updated to conform to the Green Book equations in Section III.D.2, p. 57-59.

Table 2. 3. Annual Pumping Capacity According to Monitoring Sites with ON Status and Planned Pumping for the First Six Months of Runoff Year 2015-16

Wellfield	Monitoring	Associated Production Wells	Available Capacity (AF/year)	Planned Pumping (AF)
Laws	L2	236, 239, 243, 244	10,426	
	L5*	245, 387, 388	9,122	
	Exempt	236**, 354, 422, 413	3,337	
	Wellfield Pumpage		**22,885**	**5,760-7,200**
Bishop				
	All wells	140, 371, 406, 407, 408, 410, 411, 412	18,000	
	Wellfield Pumpage		**18,000**	**7,200-9,000**
Big Pine				
	BP4	331	7,530	
	Exempt	218, 219, 330, 332, 341, 352, 375, 415	28,750	
	Wellfield Pumpage		**36,280**	**10,200-11,680**
Taboose Aberdeen	TA5	349	12,236	
	Exempt	118, 355	2,560	
	Wellfield Pumpage		**14,796**	**1,440-5,480**
Thibaut Sawmill	TS2	155	796	
	Exempt	351, 356	8,000	
	Wellfield Pumpage		**8,796**	**4,000-4,300**
Indep. - Oak				
	Exempt	59, 60, 61, 65, 357, 383EM, 384EM, 401	13,973	
	Wellfield Pumpage		**13,973**	**5,280-7,200**
Symmes Shepherd	SS1	69, 392, 393	7,385	
	Exempt	402EM	980	
	Wellfield Pumpage		**8,365**	**960-2,660**
Bairs Georges	BG2	76, 343, 348, 403	4,770	
	Exempt	343	500	
	Wellfield Pumpage		**4,770**	**660-900**
Lone Pine	Exempt	344, 346, 425	900	
	Wellfield Pumpage		**900**	**600**
	Total Owens Valley		**128,765**	**36,250-49,020**

* Monitoring site has yet to be located.

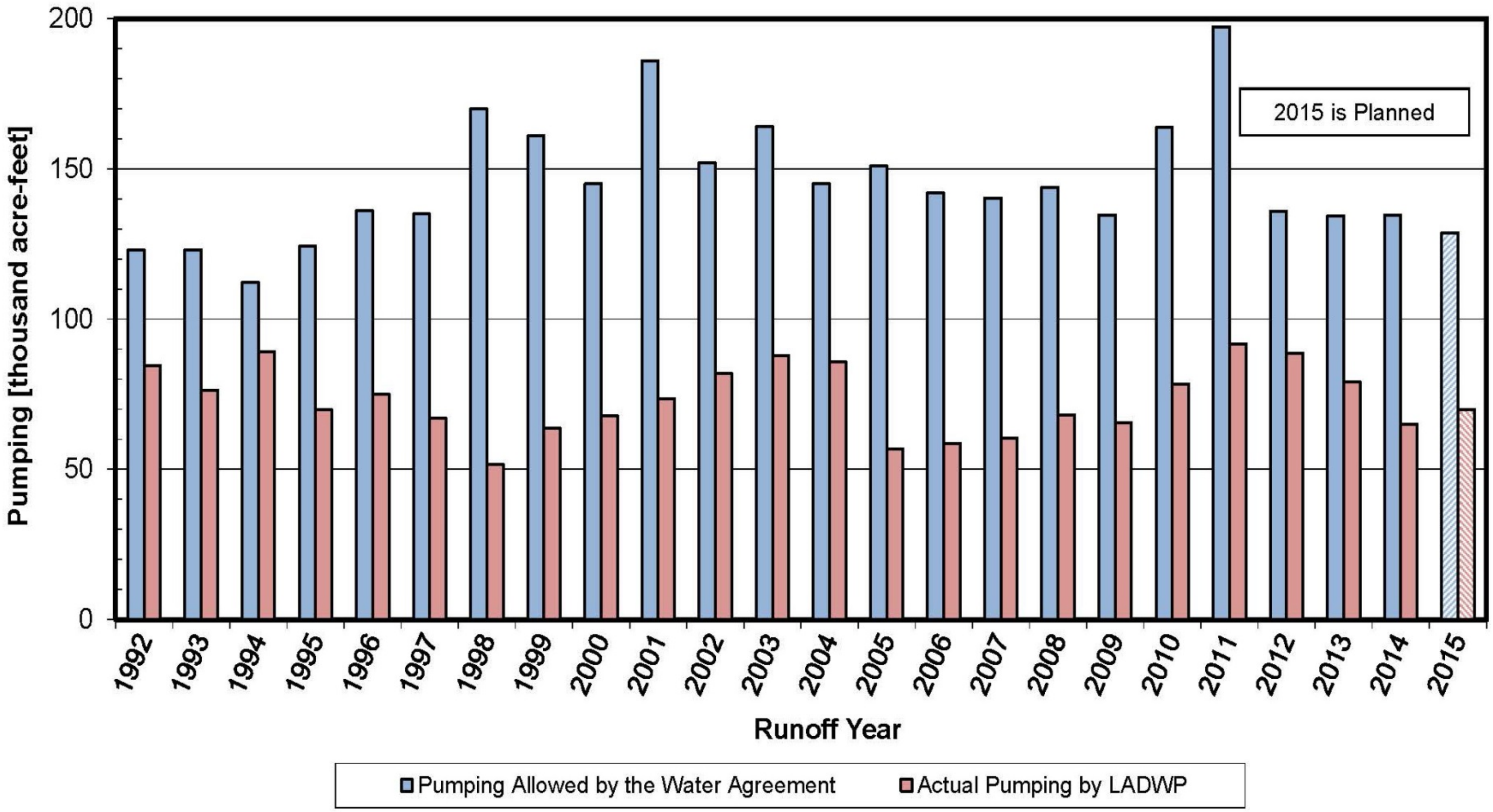

Figure 2. 2. Owens Valley Pumping – Provided by Water Agreement vs Actual

Table 2. 4 - Summary of Recharge and Pumping for Water Year 1994 - 2014 and Estimated Pumping Limit for Apr-Sep 2015 in Acre-Feet

Water	**OWENS VALLEY**	LAWS		BISHOP		BIG PINE		TABOOSE-THIBAUT		IND-SYM-BAIRS		LONE PINE		**OWENS VALLEY**	
Year	Runoff Percent	Recharge	Pumping	Recharge	Pumping	Recharge	Pumping	Recharge	Pumping	Recharge	Pumping	Recharge	Pumping	Recharge	Pumping
1996	123%	12,588	11,535	50,754	9,153	33,228	24,331	42,097	19,906	51,113	12,382	19,757	1,106	209,537	78,413
1997	125%	15,237	8,349	49,949	9,606	33,474	24,002	42,837	21,774	52,100	9,461	19,962	1,128	213,559	74,320
1998	139%	28,195	470	55,309	7,159	40,065	23,729	46,845	16,496	55,605	7,946	20,341	1,365	246,361	57,165
1999	95%	18,546	1,697	42,388	8,672	28,013	21,832	32,426	16,700	41,090	8,424	15,481	2,141	177,944	59,466
2000	80%	11,102	3,974	39,539	10,804	23,213	20,212	27,567	23,143	37,015	8,497	14,344	1,036	152,780	67,666
2001	77%	12,259	2,295	38,772	10,176	22,695	26,785	27,960	17,247	33,469	8,685	13,520	1,942	148,674	67,130
2002	63%	11,184	3,480	35,514	10,839	19,715	26,885	22,495	25,288	28,820	10,599	12,103	1,345	129,831	78,436
2003	75%	11,454	5,786	38,486	11,407	21,883	25,885	26,166	27,387	32,455	14,294	13,088	1,179	143,532	85,938
2004	71%	11,138	7,412	37,149	11,777	21,126	26,149	25,044	25,159	29,771	15,750	11,357	1,119	135,586	87,366
2005	120%	18,389	3,841	47,471	7,093	32,686	19,423	40,500	18,674	46,441	18,585	17,191	1,128	202,678	68,744
2006	138%	35,336	3,013	54,337	5,667	39,650	20,686	47,757	15,707	53,873	9,944	19,956	1,119	250,911	56,136
2007	64%	10,947	7,840	34,470	10,516	19,757	20,525	25,855	14,578	27,624	10,674	10,454	1,100	129,108	65,233
2008	68%	10,855	7,939	35,850	10,228	20,432	20,243	28,619	18,542	27,759	9,219	11,563	858	135,078	67,029
2009	73%	11,049	6,233	37,416	12,123	21,555	22,891	29,385	14,751	29,359	9,603	12,147	775	140,912	66,376
2010	93%	11,154	6,333	41,987	10,509	26,566	22,514	35,541	20,239	36,863	13,031	14,252	626	166,362	73,252
2011	134%	17,375	7,188	52,182	9,889	35,539	27,089	47,562	21,933	50,619	14,527	19,057	998	222,333	81,624
2012	72%	11,058	9,514	37,315	11,134	21,297	27,220	28,369	26,156	28,905	16,570	11,538	1,048	138,482	91,642
2013	62%	10,644	6,642	34,811	11,536	19,408	26,115	24,795	25,225	24,749	17,907	10,364	721	124,771	88,146
2014	50%	10,393	6,301	31,325	10,853	16,871	22,555	21,241	15,766	20,593	11,344	8,960	946	109,382	67,765
2015 (a)	32%	13,565	213	25,136	1,954	9,672	9,928	12,410	8,216	14,579	3,303	7,012	183	82,374	23,797
(b) TOTAL		292,469	110,055	820,158	191,095	506,847	458,999	635,472	392,887	722,803	230,745	282,448	21,863	3,260,195	1,405,644
Estimated Apr-Sep 2015 Pumping Limit			182,414		629,063		47,848		242,585		492,058		260,585		1,854,551

(a) Estimated Recharge for the 2015 Water Year; Approximate Pumping for First Half of Water year 2015 (Oct-Mar).

(b) Estimated 20 Year Total for Recharge; actual 19.5 Year Total for Pumping.

Table 2. 5 Exempt Wells in Owens Valley

LADWP Groundwater Pumping Wells Exempt from Water Agreement ON/OFF Provisions
Revised June 22, 2010

Well Number	WellField	Duration	Reason
354 p(1)	Laws	Annual	Sole Source-Town Supply
413 b(1)	Laws	Annual	Sole Source-Town Supply and E/M Supply
341 b(1)	Big Pine	Annual	Sole Source-Town Supply
352 b(1)	Big Pine	Annual	Same as above
415 p(1) (6)	Big Pine	Annual	Same as above
357 p(1)	Independence-Oak	Annual	Same as above
384 b(1) (2)	Independence-Oak	Annual	Same as above
344 p(1)	Lone Pine	Annual	Same as above
346 b(1)	Lone Pine	Annual	Same as above
330(3)	Big Pine	Annual	Sole Source-Fish Hatcheries
332(3)	Big Pine	Annual	Same as above
409(3)	Big Pine	Annual	Same as above
351	Thibaut-Sawmill	Annual	Same as above
356	Thibaut-Sawmill	Annual	Same as above
375	Big Pine	Annual	Mae-up for Big Pine Re-greening
218	Big Pine	Annual	No impact on areas with groundwater dependent vegetation
219	Big Pine	Annual	Same as above
118	Taboose-Aberdeen	Annual	Same as above
401	Independence-Oak	Annual	Same as above
59	Independence-Oak	Annual	Same as above
60	Independence-Oak	Annual	Same as above
65	Independence-Oak	Annual	Same as above
383 E/M	Independence-Oak	Annual	Same as above
384 E/M(2)	Independence-Oak	Annual	Same as above
61	Independence-Oak	Irrigation season	Sole Source-Irrigation; no impact on areas with groundwater dependent vegetation
402 E/M	Symmes-Shepherd	Irrigation season	Same as above
390 E/M	Lone Pine	Irrigation season	Same as above
343	Bairs-Georges	Irrigation season in below average runoff years	Sole Source-Irrigation in below average runoff years
365(4)	Laws	Annual	Sole Source-Irrigation; no impact on areas with groundwater dependent vegetation
236(4)	Laws	Irrigation Season	Sole Source-Irrigation
413 E/M(5)	Laws	Irrigation Season	Sole Source-Irrigation

1. Primary town supply well is designated by p; Backup town supply well is designated by b.
2. Well 384 is a dual purpose well, water to Enhancement/Mitigation (E/M) supply is indicated by 384 and Independence domestic supply is indicated as 384 b.
3. Wells 330, 332, and 409 may only be pumped two at a time, unless pumped for testing or emergencies.
4. Well 365 designated as primary and Well 236 designated as backup irrigation supply.
5. Well 413 is a dual purpose well. Water is supplied to the Laws Museum Irrigation Projects east and west of the museum and Laws domestic supply is indicated as 413b.
6. Currently not pump-equipped.

Table 2. 6 Planned Owens Valley Pumping for the First Six Months of 2015-16 Runoff Year (acre-feet)

Month	Laws	Bishop	Big Pine	Taboose-Aberdeen	Thibaut-Sawmill	Independ.-Oak	Symmes-Shepherd	Bairs-Georges	Lone Pine	TOTAL
April	960-1,200	1200-1,500	1,700	240	667-716	880-1,100	160	110	100	6,087-6,596
May	960-1,200	1,200-1,500	1,700	240	667-716	880-1,100	160	110	100	6,117-6,926
June	960-1,200	1,200-1,500	1700-2,170	240-1,250	667-717	880-1,400	160-770	110-170	100	6,117-6,927
July	960-1,200	1,200-1,500	1,700-2,170	240-1,250	667-717	880-1,400	160-770	110-170	100	6,120-8,967
August	960-1,200	1,200-1,500	1,700-1,970	240-1,250	666-717	880-1,100	160-400	110-170	100	6,116-8,967
September	960-1,200	1,200-1,500	1,700-1,970	240-1,250	666-717	880-1,100	160-400	110-170	100	6,116-8,967
TOTAL	5,760-7,200	7,200-9,000	10,200-11,680	1,440-5,480	4,000-4,300	5,280-7,200	960-2,660	660-900	600	36,250-49,020

Laws Wellfield (Figure 2.3)

Monitoring site L2 is in ON status. Production wells controlled by this monitoring site have an available production capacity of 10,426 acre-feet. Wells linked to monitoring site L5 have a capacity of 9,122 acre-feet. Exempt wells within the Laws Wellfield have a capacity of 3,337 acre-feet. The sum total of available pumping capacity in the Laws Wellfield is 22,885 acre-feet. Well 365 has had a reduction in production capacity and is in the process of being replaced. Well 236, associated with monitoring site L2, is used as a backup along with Well 422 as an exempt well irrigation water supply.

Planned groundwater pumping for the first half of the runoff year in the Laws Wellfield is between approximately 5,960 to 7,400 acre-feet, contingent on water needs and environmental conditions. Groundwater pumping is planned to supply Owens Valley demands including the town water system, E/M projects, and irrigated lands.

LADWP modified production wells W385 and W386 associated with monitoring site L4 recently by sealing the screen zone within the shallow aquifer. LADWP is currently equipping these wells and is planning to conduct the initial operation of these wells, starting W385. The pumping test of each well is expected to last approximately 6 months and the goal is to determine potential effects of pumping on shallow groundwater levels in the vicinity of these wells.

Bishop Wellfield (Figure 2.4)

Pumping in the Bishop Wellfield is governed by the provisions of the Hillside Decree and the Water Agreement, which limit LADWP's annual groundwater extractions (pumping and flowing wells) from the Bishop Cone to an amount commensurate with the total amount of water used on City lands on the Bishop Cone (including conveyance and other losses). Under the current audit protocols, recent total water used on City lands within the Bishop Cone area has been approximately 25,000 acre-feet per year. In the 2015-16 Runoff Year, the total water used it likely to be reduced to approximately 18,000 acre-feet. The current total available groundwater extraction capacity in the Bishop Wellfield is approximately 18,000 acre-feet. The planned groundwater pumping from the Bishop Wellfield is between approximately 7,200 to 9,000 acre-feet for the first half of the 2015-16 runoff year, contingent on water needs and environmental conditions.

Figure 2.5 shows water use on City lands on Bishop Cone in comparison with the groundwater extractions (flowing and pumping wells) for runoff years 1996 to present.

The current Bishop Cone Audit does not include a number of known uses and losses, including some uses that are currently being measured. These unaccounted for uses should be added to the total Bishop Cone Audit and the audit protocols should be revised to more accurately reflect actual uses and losses.

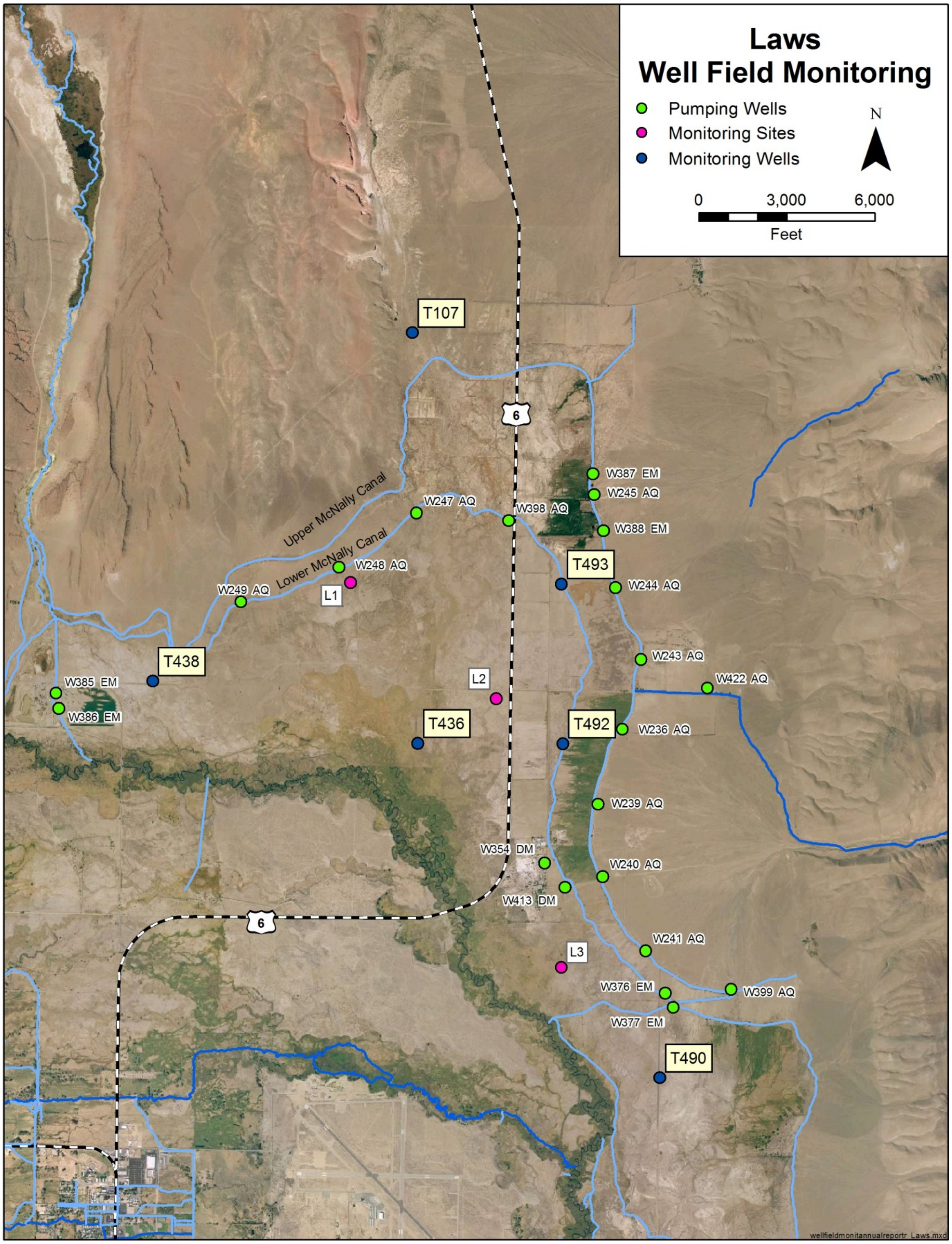

Figure 2. 3 Laws Wellfield

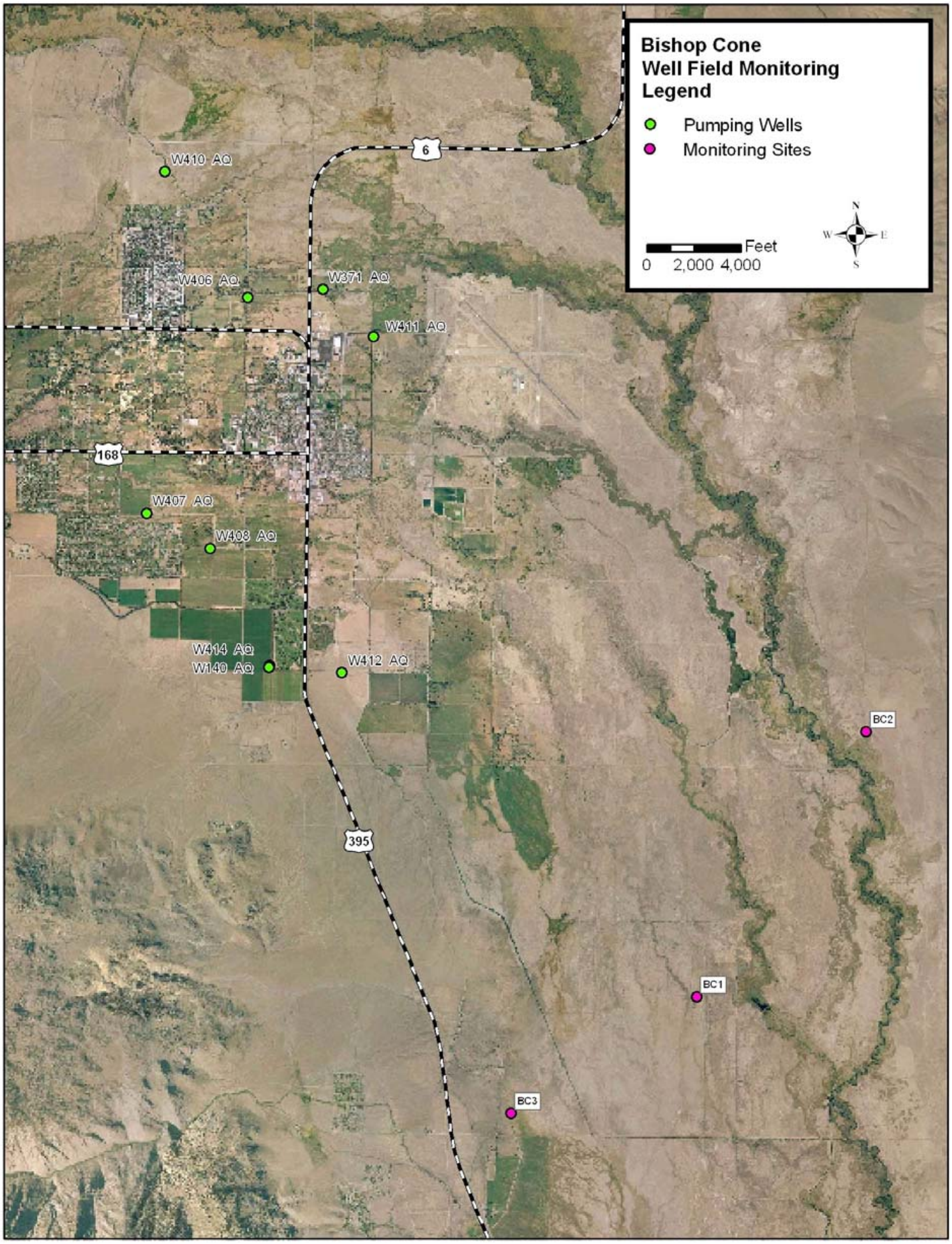

Figure 2. 4 Bishop Wellfield

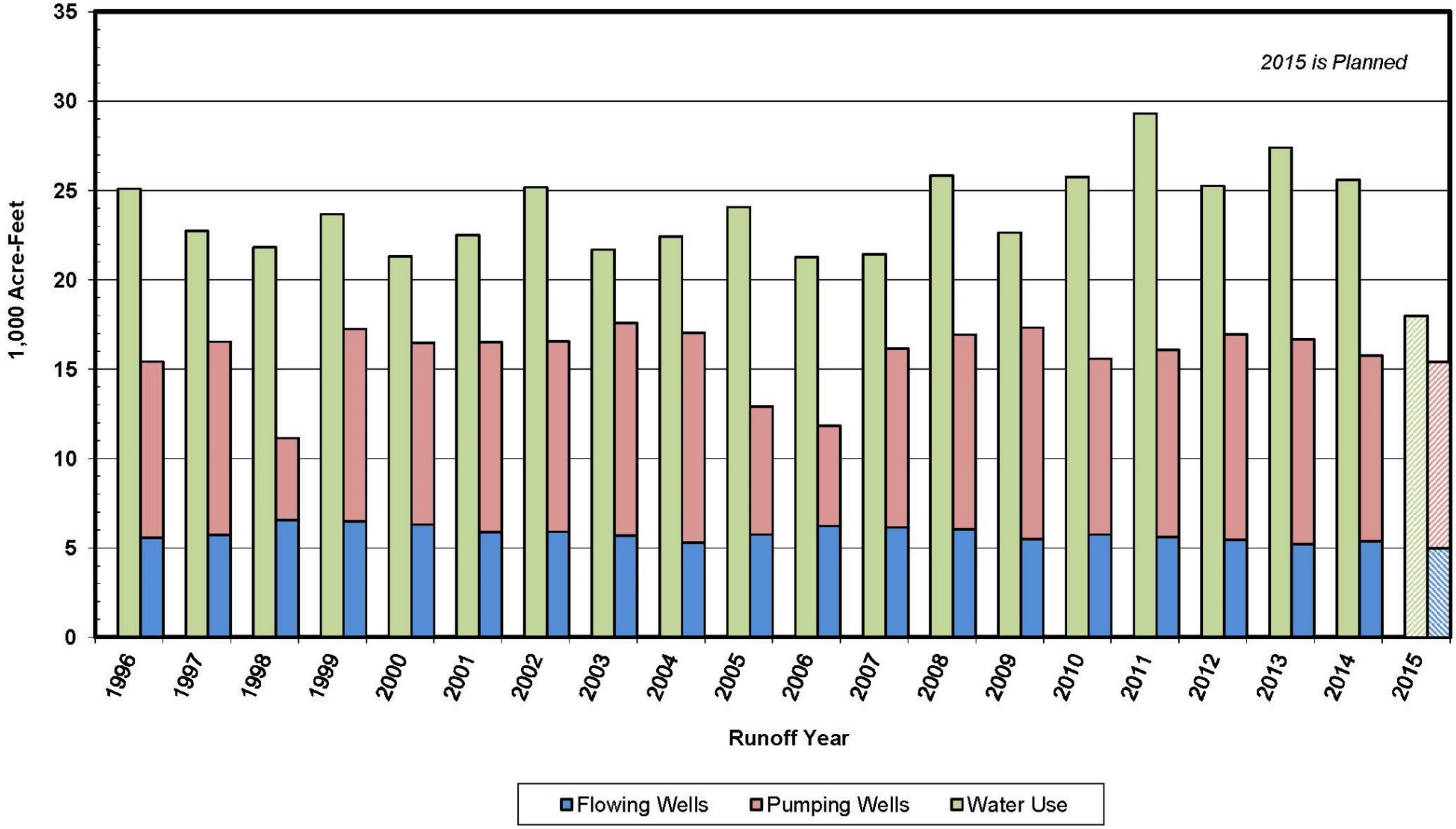

Figure 2. 5 Groundwater Extraction (flowing & pumping) and Water Use on Los Angeles Land on Bishop Cone

Big Pine Wellfield (Figure 2.6)

Monitoring sites BP4 is in ON status. Production Well 331, managed in conjunction with monitoring site BP4, has a production capacity of 7,530 acre-feet. Exempt wells including Well 218, Well 219, town supply wells, and Fish Springs Fish Hatchery wells in the Big Pine Wellfield have a combined capacity of 28,750 acre-feet. The total available capacity in the Big Pine Wellfield is 36,280 acre-feet. The total planned pumping in the Big Pine Wellfield is for the first six months of the 2015-16 runoff year is between approximately 10,200 acre-feet and 11,680 acre-feet, contingent on water needs and environmental conditions.

Taboose-Aberdeen Wellfield (Figure 2.7)

Monitoring site TA5 is in ON status. Production Well 349 is controlled by monitoring site TA5 and has an available pumping capacity of approximately 12,236 acre-feet. Exempt Well 118 in the Taboose-Aberdeen Wellfield has a capacity of 2,320 acre-feet . Exempt well W355 pumps approximately 240 acre-feet to supply the Hines Spring project. The total available groundwater pumping capacity in the Taboose-Aberdeen Wellfield is 14,796 acre-feet. The planned groundwater pumping in the Taboose-Aberdeen Wellfield for the first half of the 2015-16 runoff year is contingent on water needs and prevailing environmental conditions and will range between 1,440 acre-feet and approximately 5,480 acre-feet.

Thibaut-Sawmill Wellfield (Figure 2.8)

Monitoring sites TS2 is in ON status. Production well W155, controlled by monitoring site TS2 has a production capacity of 796 acre-feet and can supply water for irrigation to Eight-Mile Ranch to supplement surface water for the ranch. Exempt Blackrock Fish Hatchery supply wells W351 and W356 have capacities of 13,200 acre-feet and 8,000 acre-feet respectively. The total available pumping capacity in the Thibaut-Sawmill Wellfield for the 2015-16 runoff year is about 8,796 acre-feet.

Based on the resolution of a dispute between Inyo County of LADWP regarding the conditions of the vegetation parcel BLK94, located west of the wellfield, the groundwater pumping to supply Blackrock Hatchery will be limited to 8,000 acre-feet per year. Total planned pumping in the Thibaut-Sawmill Wellfield for the first half of the 2015-16 runoff year is planned to range between 4,000 acre-feet and 4,300 acre-feet, subject to hatchery demands, water supply needs, and environmental conditions.

Independence-Oak Wellfield (Figure 2.8)

None of the monitoring sites in the Independence-Oak Wellfield are in ON status. Independence-Oak exempt wells have a combined capacity of 13,973 acre-feet. The total available pumping capacity in the Independence-Oak Wellfield is 13,973 acre-feet. The anticipated range of groundwater pumping in the Independence-Oak Wellfield for the first six months of the 2015-16 runoff year is between 5,280 and 7,200 acre-feet, which includes water for municipal, irrigation, town, and E/M project supply.

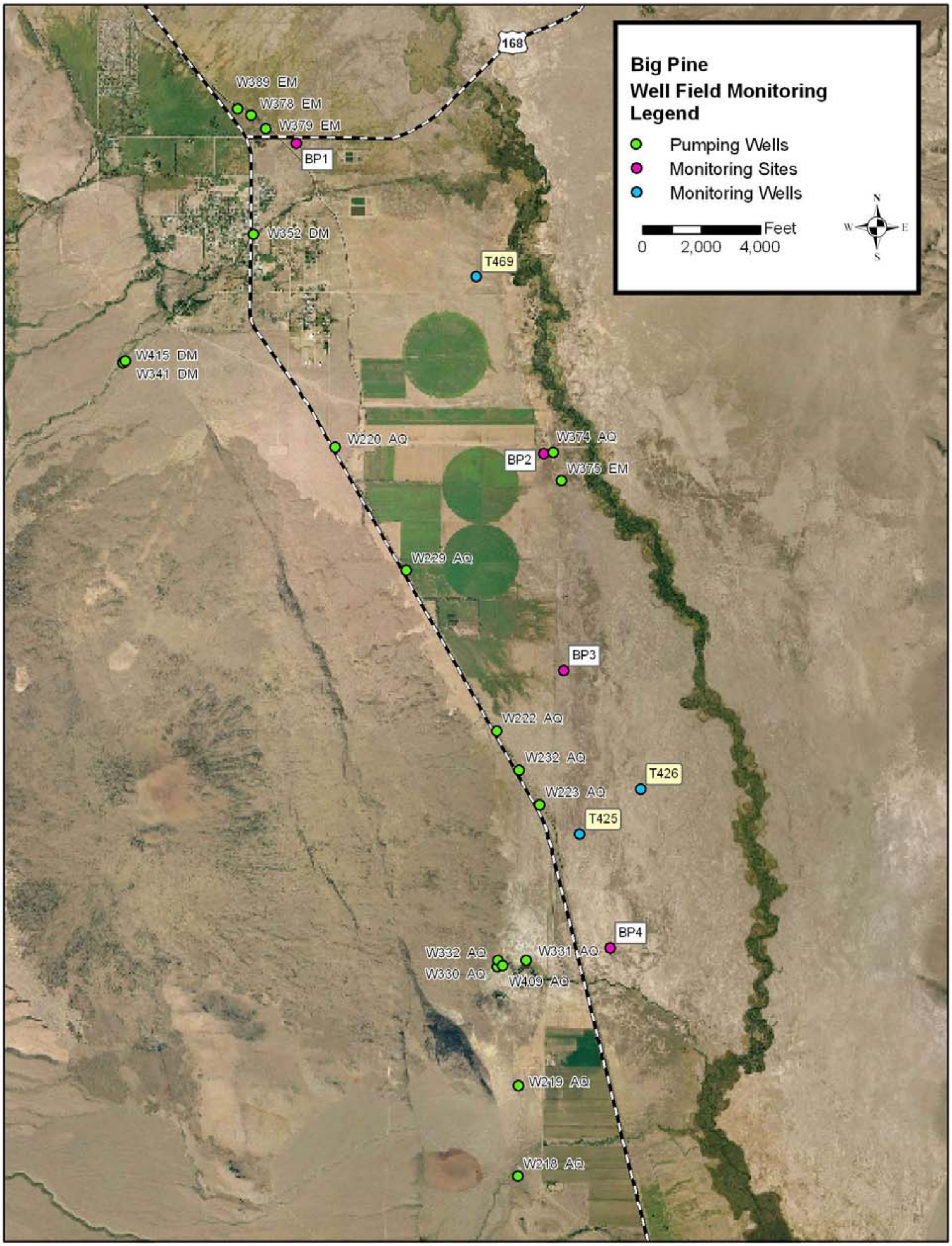

Figure 2. 6 Big Pine Wellfield

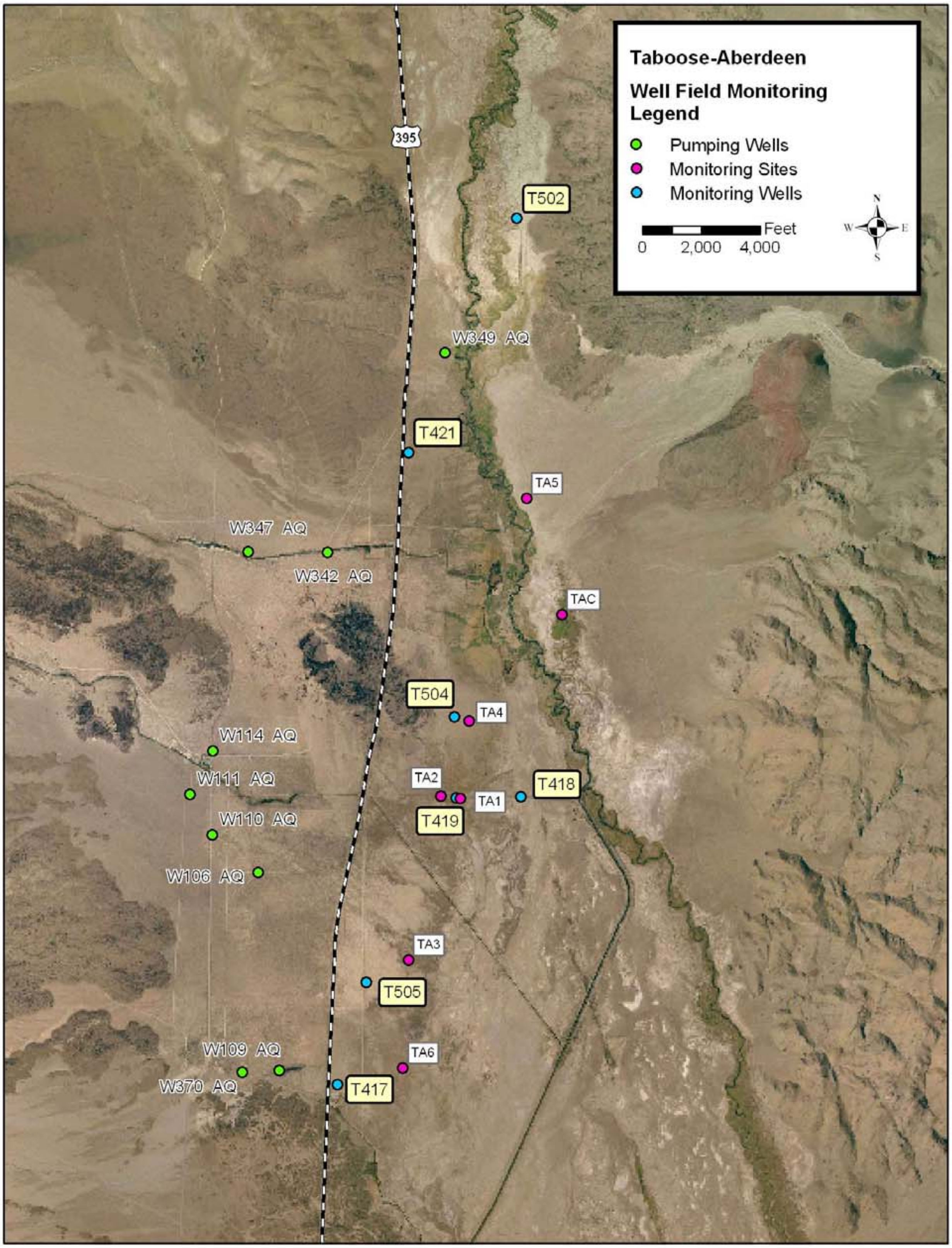

Figure 2. 7 Taboose-Aberdeen Wellfield

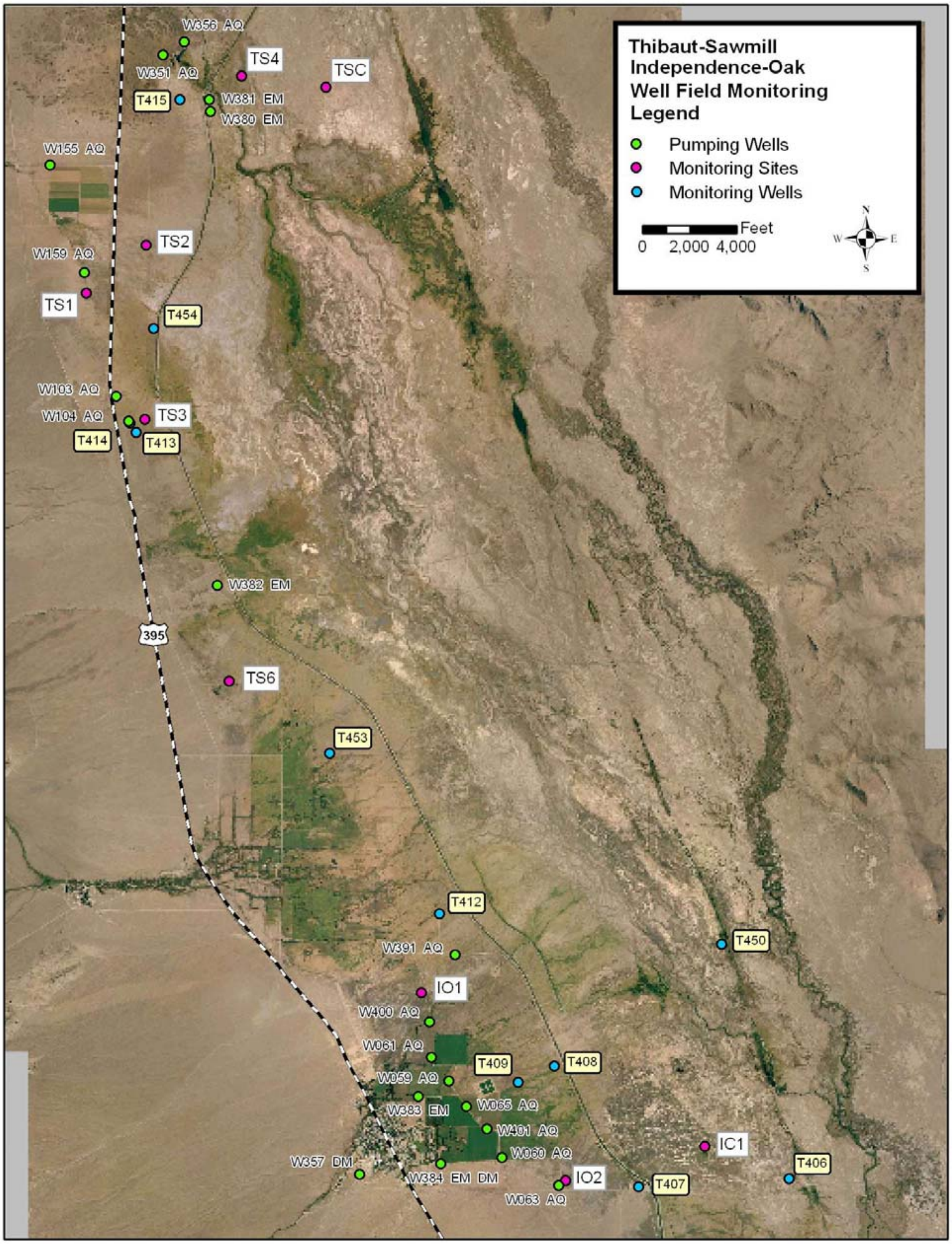

Figure 2. 8. Thibaut-Sawmill and Independence-Oak Wellfields

Symmes-Shepherd Wellfield (Figure 9)

Monitoring sites SS1 is in ON status. Monitoring site SS1 has an annual capacity of 7,385 acre-feet. Exempt Well 402 has a capacity of about 1,000 acre-feet. Total available capacity in the Symmes-Shepherd Wellfield for the 2015-16 runoff year is approximately 8,385 acre-feet. The total pumping in the Symmes-Shepherd Wellfield for the first six months of the 2015-16 runoff year is planned to be between approximately 960 and 2,660 acre-feet, contingent on water needs and environmental conditions.

Bairs-Georges Wellfield (Figure 9)

Vegetation monitoring site BG2 is in ON status. The wells managed under this site have a combined annual capacity of 2,896 acre-feet. Exempt Well 343 has an available capacity of 500 acre-feet (based upon a six month exemption period). The total available capacity in the Bairs-Georges Wellfield for the 2015-16 runoff year is 2,896 acre-feet. Groundwater pumping in the Bairs-Georges Wellfield for the first six months of the runoff year is planned to be between approximately 660 and 900 acre-feet, contingent on water needs and environmental conditions.

Lone Pine Wellfield (Figure 10)

Lone Pine exempt wells are Well 344 and Well 346, and E/M project supply Well 425. These three wells have an annual available capacity of approximately 900 acre-feet. Well 425 is a replacement for the degraded Well W390 acre-feet.

Well 416 is a production well in the Lone Pine Wellfield drilled in 2002. Hydrologic testing was conducted on Well 416 during the 2009-10 runoff year. This well was modified in 2014 to seal the screen portion of the aquifer within the shallow aquifer. LADWP is planning to equip and conduct the initial operation of this well. If initial operation is performed during 2015-16 runoff year, it will be in addition to the currently planned pumping from Lone Pine Wellfield. The Technical Group has been requested to designate a monitoring site for this well.

The planned groundwater pumping from the Lone Pine Wellfield during the first six months of the 2015-16 runoff year is 750 acre-feet, contingent on water supply needs and environmental conditions.

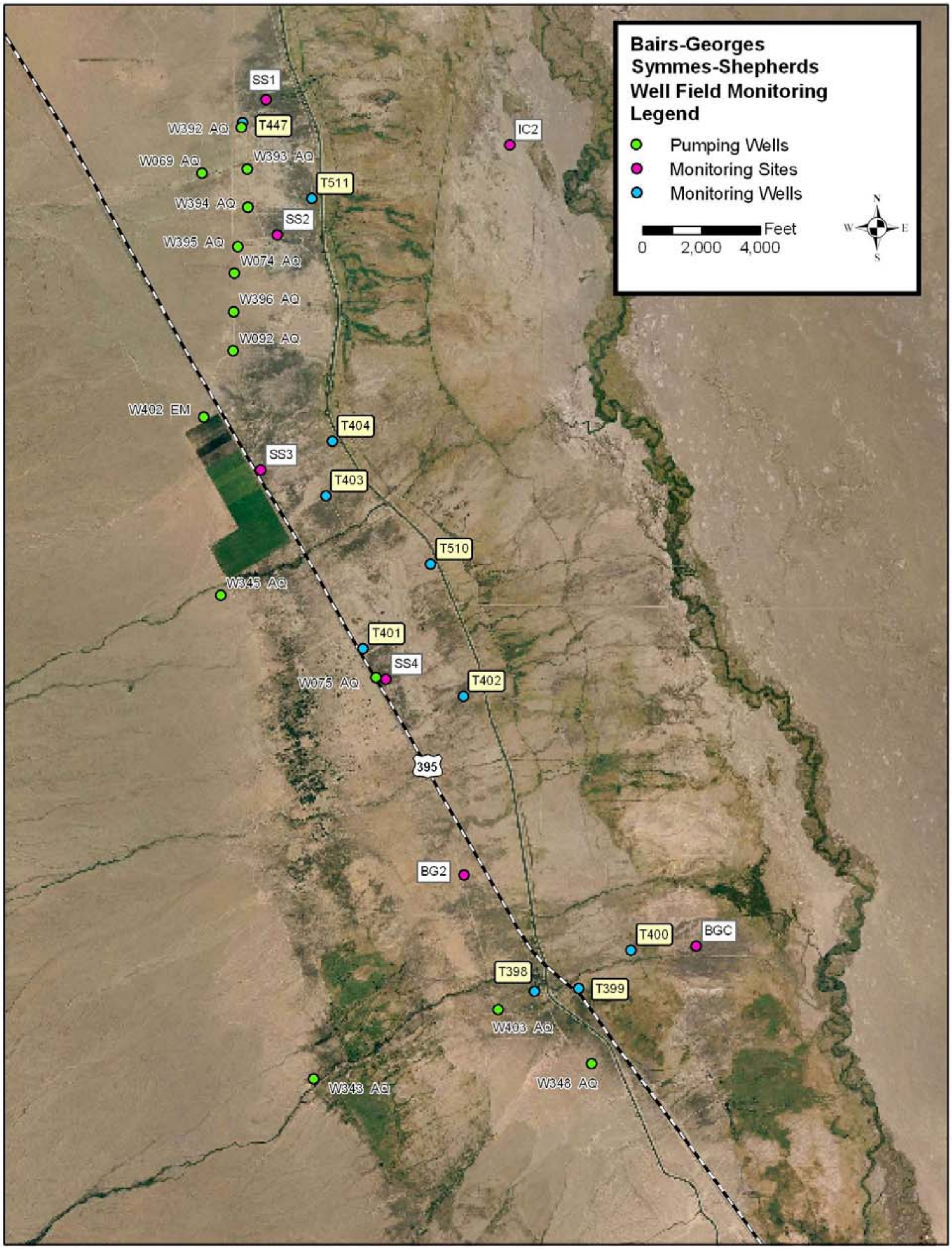

Figure 2. 9 Bairs-Georges and Symmes-Sheperds Wellfields

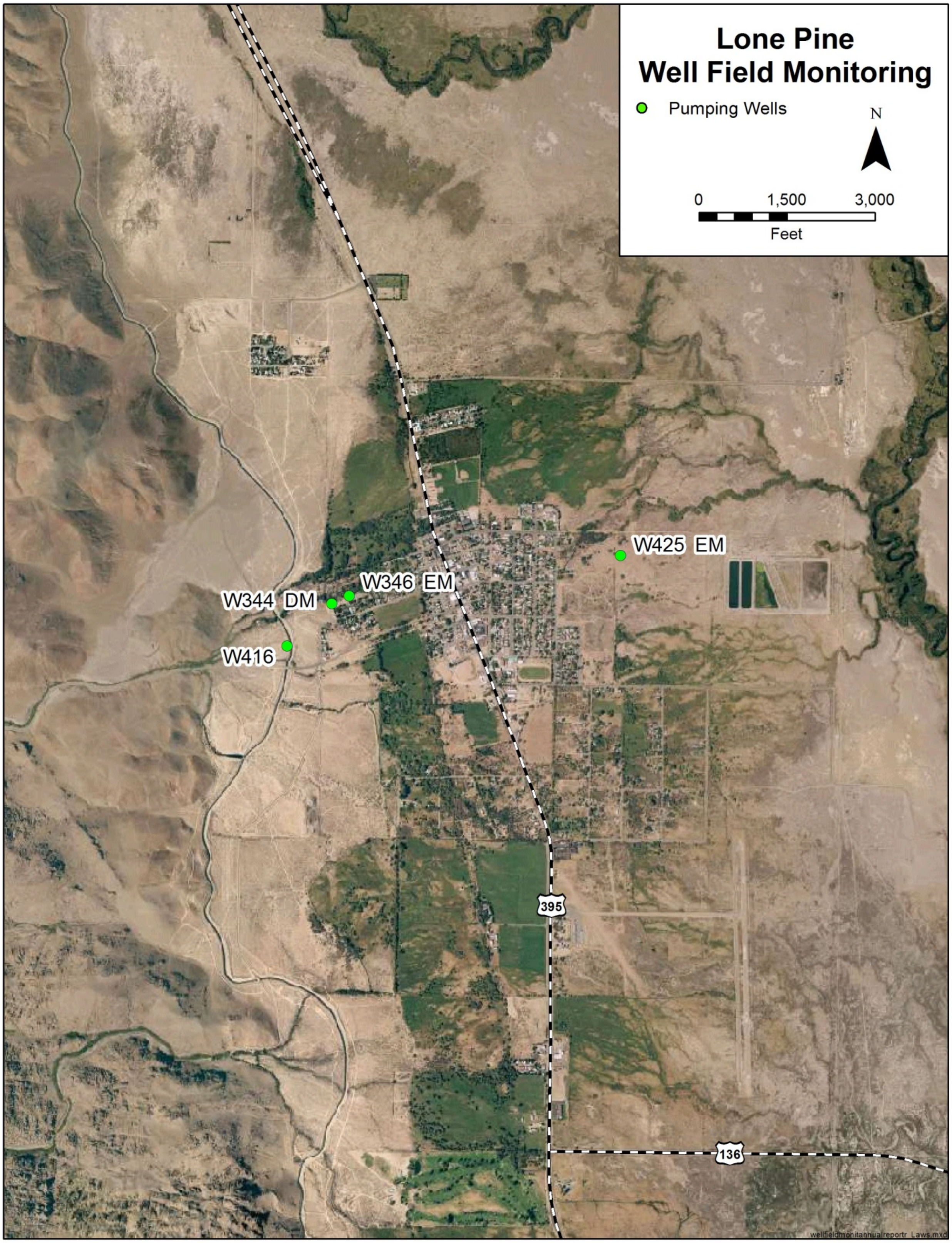

Figure 2. 10 Lone Pine Wellfield

2.3. Owens Valley Uses (Including Enhancement/Mitigation Projects)

Table 2.7 shows the historic (1981-82) uses and the planned monthly uses within the Owens Valley for 2015-16. The in-valley uses shown on Table 2.7 consist of irrigation, stockwater, recreation, and wildlife projects, E/M supply, Lower Owens River Project (LORP) usage, 1600 Acre-Feet Projects, and usage pursuant to California Health and Safety Code Section 42316 for dust abatement projects on Owens Lake. As shown in Table 2.7 and Figure 2.11, LADWP plans to provide approximately 121,200 acre-feet for in-valley uses this runoff year, not including water supplied to the Owens Valley Native American Indian lands.

The most notable change in the Owens Valley water uses for 2015-16 is the significantly low water availability for irrigation. As shown in Figure 2.11, only 16,500 acre-feet of water will be available for irrigation in 2015-16, while in 2014-15 there was approximately 43,500 acre-feet used for irrigation.

The abysmal forecasted runoff for the year is the primary reason that there is significantly less water available for irrigation. The expect supply during a 36% of normal expected runoff year will result in a natural drop in irrigation. 2014-15 was a 52% of normal runoff year, which tied for the lowest year on record. Also, export from the Mono Basin will be 4,500 acre-feet, down from 16,000 acre-feet for the recent past. Even with no water expected to be delivered to Haiwee Reservoir during the irrigation season, typical uses in the Owens Valley would far exceed runoff supply in 2015-16.

The primary consumptive use of water in the Owens Valley is the Owens Lake Dust Mitigation Program (OLDMP). Water use in the 2014-15 runoff year by the OLDMP was 53,700 acre-feet. Water used for dust mitigation in 2015-2016 is anticipated to be 60,700 acre-feet.

Releases to the LORP from the LAA Intake facility began on December 6, 2006. An average flow of over 40 cubic feet per second (cfs) is now maintained throughout the entire 62 mile stretch of the Lower Owens River, south of the Intake structure. When needed, the releases at the Intake are augmented through additional releases at the Independence, Blackrock, Georges, Locust, and Alabama Spill Gates to maintain a continuous flow of at least 40 cfs in the river channel. Table 2.7 shows estimated 2014-15 water use by the Lower Owens River on a monthly basis. Water use by the project during 2014-15 was approximately 14,300 acre-feet. Total LORP uses include the Lower Owens River, Owens Delta, Blackrock Waterfowl Management Area, and project associated losses.

The Water Agreement provides that "... *enhancement/mitigation projects shall continue to be supplied by enhancement/mitigation wells as necessary*." Due to the monitoring sites controlling some of the production wells supplying E/M projects being in OFF status, the amount of water supplied to E/M projects has often exceeded the amount of water provided by E/M project supply wells. LADWP has chosen to supply certain E/M projects from surface water sources in the past. Future E/M allotments may be influenced by the availability of E/M wells and operational demands. Table 2.8 shows the planned water supply to E/M projects and the forecast imbalance between the E/M project water use and the E/M project groundwater supply through the end of the

2015-16 runoff year. E/M project water demands during the 2015-16 runoff year are expected to be approximately 4,500 acre-feet greater than E/M groundwater pumping. The cumulative E/M water supply shortfall is estimated to be approximately 195,025 acre-feet by the end of the runoff year.

The Technical Group is currently evaluating the water supply issues associated with the E/M projects and will provide its findings to the Inyo/Los Angeles Standing Committee. It is expected that the Standing Committee will be requested to take appropriate action necessary to ensure water supplied to E/M projects is in conformance with the provisions of the Water Agreement.

Table 2. 7 Historic (1981-82) and Projected (2015-16) Water Uses on City of Los Angeles Land in Owens Valley (acre-feet)

Use	April 1981	April 2015	May 1981	May 2015	June 1981	June 2015	July 1981	July 2015	August 1981	August 2015	September 1981	September 2015	TOTAL Apr-Sep 1981	TOTAL Apr-Sep 2015
Irrigation	3,980	2,200	7,958	2,800	10,373	3,000	9,476	3,200	8,295	2,600	6,321	2,000	**46,403**	**15,800**
Stockwater	1,141	900	1,319	1,100	1,244	1,100	1,245	1,100	1,219	1,000	1,319	800	**7,487**	**6,000**
E / M	0	1,320	0	1,680	0	1,640	0	1,710	0	1,300	0	1,100	**0**	**8,750**
LORP	0	500	0	1,700	0	2,700	0	3,200	0	2,700	0	2,100	**0**	**12,900**
Owens Lake	0	6,800	0	9,500	0	6,000	0	2,500	0	4,000	0	10,000	**0**	**38,800**
Rec. & Wildlife	379	500	804	700	1,160	800	1,455	850	1,381	800	1,406	650	**6,585**	**4,300**
1600 ACFT Proj.	0	85	0	91	0	116	0	157	0	74	0	115	**0**	**638**
Total	***5,500***	***12,305***	***10,081***	***17,571***	***12,777***	***15,356***	***12,176***	***12,717***	***10,895***	***12,474***	***9,046***	***16,765***	***60,475***	***87,188***

Use	October 1981	October 2015	November 1981	November 2015	December 1981	December 2015	January 1982	January 2016	February 1982	February 2016	March 1982	March 2016	TOTAL Oct-Mar 81-82	TOTAL Oct-Mar 15-16	TOTAL Apr-Mar 81-82	TOTAL Apr-Mar 15-16
Irrigation	263	600	0	0	0	0	0	0	0	0	14	100	**277**	**700**	**46,680**	**16,500**
Stockwater	1,065	700	1,045	700	1,050	700	1,007	700	1,010	700	1,098	700	**6,275**	**4,200**	**13,762**	**10,200**
E / M	0	250	0	100	0	100	0	100	0	100	0	100	**0**	**750**	**0**	**9,500**
LORP	0	900	0	250	0	150	0	250	0	250	0	600	**0**	**2,400**	**0**	**15,300**
Owens Lake	0	8,500	0	3,100	0	2,500	0	1,100	0	2,200	0	4,500	**0**	**21,900**	**0**	**60,700**
Rec. & Wildlife	781	650	713	550	565	550	478	550	342	400	447	400	**3,326**	**3,100**	**9,911**	**7,400**
1600 ACFT Proj.	0	215	0	215	0	105	0	97	0	185	0	145	**0**	**962**	**0**	**1,600**
Total	***2,109***	***11,815***	***1,758***	***4,915***	***1,615***	***4,105***	***1,485***	***2,797***	***1,352***	***3,835***	***1,559***	***6,545***	***9,878***	***34,012***	***70,353***	***121,200***

NOTE: Rec & Wildlife includes LORP off-river lakes and ponds w ater use
An additional 3,200 acre-feet per year is provided to Indian lands

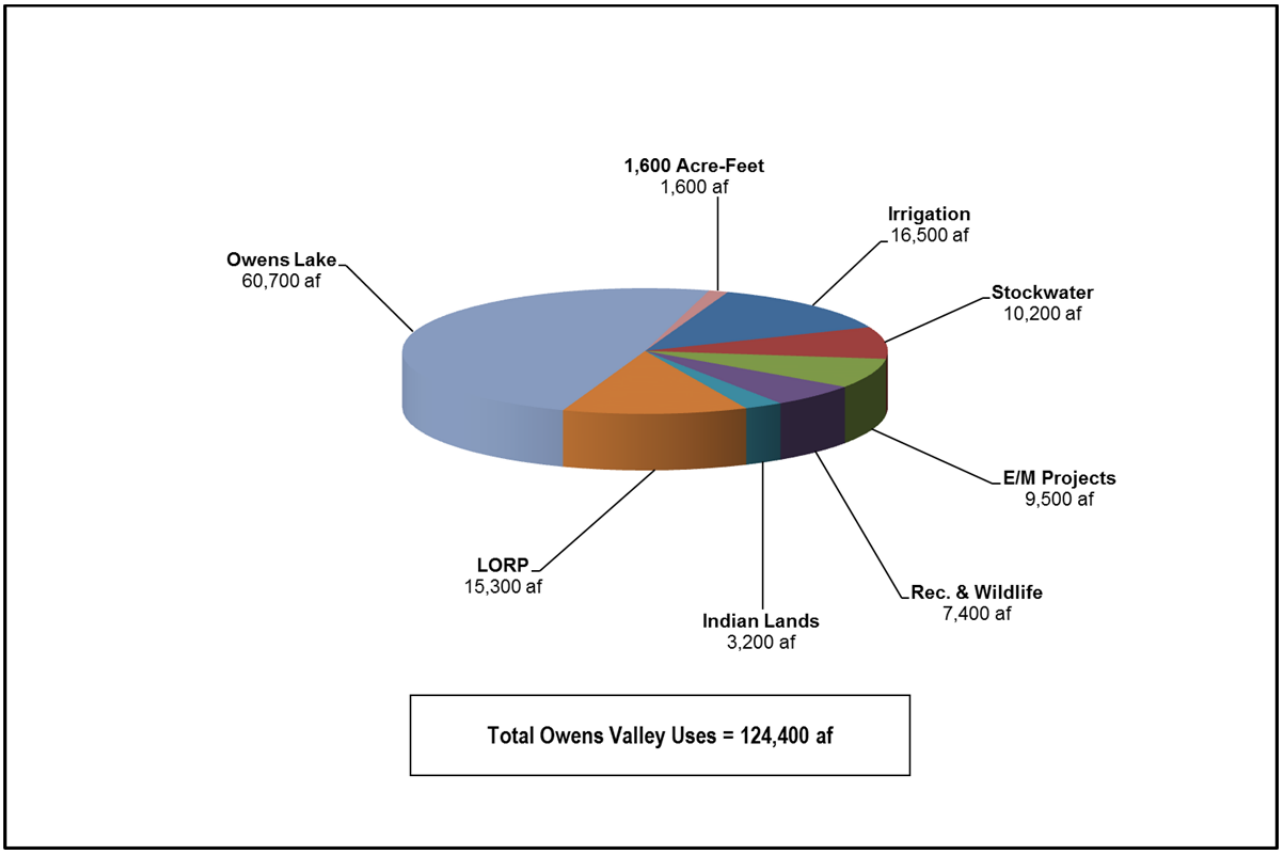

Figure 2. 11 Distribution of Planned Owens Valley Water Use for 2015-16 Runoff Year

Table 2. 8 Owens Valley Groundwater Pumping for Production and E/M Water Use

(1984-85 through 2015-16 Runoff Year (acre-feet))

Runoff Year	Owens Valley Runoff (1)	Total Pumping	Non-E/M Pumping	E/M Pumping	E/M Water Uses	E/M Pumping & Use Imbalance	Cumulative E/M Pumping & Use Imbalance
1984-85	0	61,981	61,981	0	0		0
1985-86	0	107,718	107,718	0	109		0
1986-87	0	69,887	69,887	0	12,696	(3)	0
1987-88	0	209,394	179,884	29,510	29,360		0
1988-89	0	200,443	171,012	29,431	30,872		0
1989-90	0	155,972	133,409	22,563	23,330		0
1990-91	0	88,904	70,817	18,087	17,949		0
1991-92	0	87,310	71,520	15,790	20,517	-4,727	-4,727
1992-93	0	84,453	70,688	13,765	18,357	-4,592	-9,319
1993-94	0	76,329	67,338	8,991	19,310	-10,319	-19,638
1994-95	0	89,219	78,209	11,010	20,812	-9,802	-29,440
1995-96	0	69,752	57,180	12,572	22,914	-10,342	-39,782
1996-97	0	74,904	57,981	16,923	23,949	-7,026	-46,808
1997-98	124	66,914	52,760	14,154	21,500	-7,346	-54,154
1998-99	149	51,574	47,353	4,221	19,672	(3)	-54,154
1999-00	89	63,675	59,342	4,333	24,450	-20,117	-74,271
2000-01	84	67,795	61,456	6,339	20,611	-14,272	-88,543
2001-02	83	73,349	70,055	3,294	21,815	-18,521	-107,064
2002-03	66	81,979	76,059	5,920	21,394	-15,474	-122,538
2003-04	81	87,732	80,734	6,998	21,116	-14,118	-136,656
2004-05	77	85,820	78,110	7,710	18,327	-10,617	-147,273
2005-06	136	56,766	51,695	5,071	19,356	-14,285	-161,558
2006-07	146	58,621	53,925	4,696	17,357	(3)	-161,558
2007-08	61	60,338	53,413	6,925	11,312	-4,387	-165,945
2008-09	74	68,971	61,053	7,918	10,646	-2,728	-168,673
2009-10	77	64,138	57,946	6,192	10,695	-4,503	-173,176
2010-11	104	78,248	71,233	7,015	10,807	-3,792	-176,968
2011-12	142	91,699	84,365	7,334	11,993	-4,659	-181,627
2012-13	57	*88,689*	*83,034*	*5,655*	*8,914*	*-3,259*	*-184,886*
2013-14	54	*78,880*	*73,888*	*4,992*	*8,170*	*-3,178*	*-188,064*
2014-15	51	68,159	62,450	5,709	8,170	-2,461	-190,525
2015-16 (2)	*36*	*70,000*	*65,000*	*5,000*	*9,500*	*-4,500*	*-195,025*

(1) Based on 1961-2010 average: 415,974 acre-feet. Includes some runoff contribution to the Laws Wellfield from the White Mountains.
(2) this is only Apr-Sep pumping/uses. Forecast for planned pumping of 47,930 acre-feet (planned pumping ranges 36,250-47,830 acre-feet)
(3) surface water was available

2.4. Aqueduct Operations

Table 9 shows planned LAA reservoir storage levels and monthly deliveries to Los Angeles. Based on this plan, approximately 42,377 acre-feet will be exported from Inyo and Mono Counties to the City during the 2015-16 runoff year.

2.5. Water Exports to Los Angeles

Figure 2.12 provides a record of water exports from the Eastern Sierra to Los Angeles, averaging approximately 337,000 acre-feet per year since 1970. Figure 2.13 shows the LAA contribution to the City water supply relative to other sources and the total annual water supplied to Los Angeles since 1970. LADWP estimates that Los Angeles will require about 506,000 acre-feet of water during the 2015-16 runoff year. It is anticipated that water from the Eastern Sierra will make up about 9% of the 2015-16 supply. Water purchases from the Metropolitan Water District of Southern California will provide about 70% of the City's supply, groundwater from Los Angeles area aquifers will provide about 19%, and recycled water will supply about 2% of the City's water needs.

Table 2. 9 Planned Los Angeles Aqueduct Operations for 2015-16 Runoff Year

Month	Owens Valley-Bouquet Reservoir Storage 1st of month Storage (acre-feet)	Flow to Haiwee (acre-feet)	Aqueduct Delivery to Los Angeles (acre-feet)
April	160,819	0	400
May	163,228	0	300
June	157,377	0	300
July	151,707	0	3,000
August	145,270	0	6,000
September	137,163	0	3,000
October	125,129	0	600
November	123,781	5,100	3,000
December	130,495	8,000	7,700
January	135,643	9,900	6,077
February	143,951	9,000	6,000
March	150,609	9,300	6,000
TOTAL	***-10,210***		***42,377***

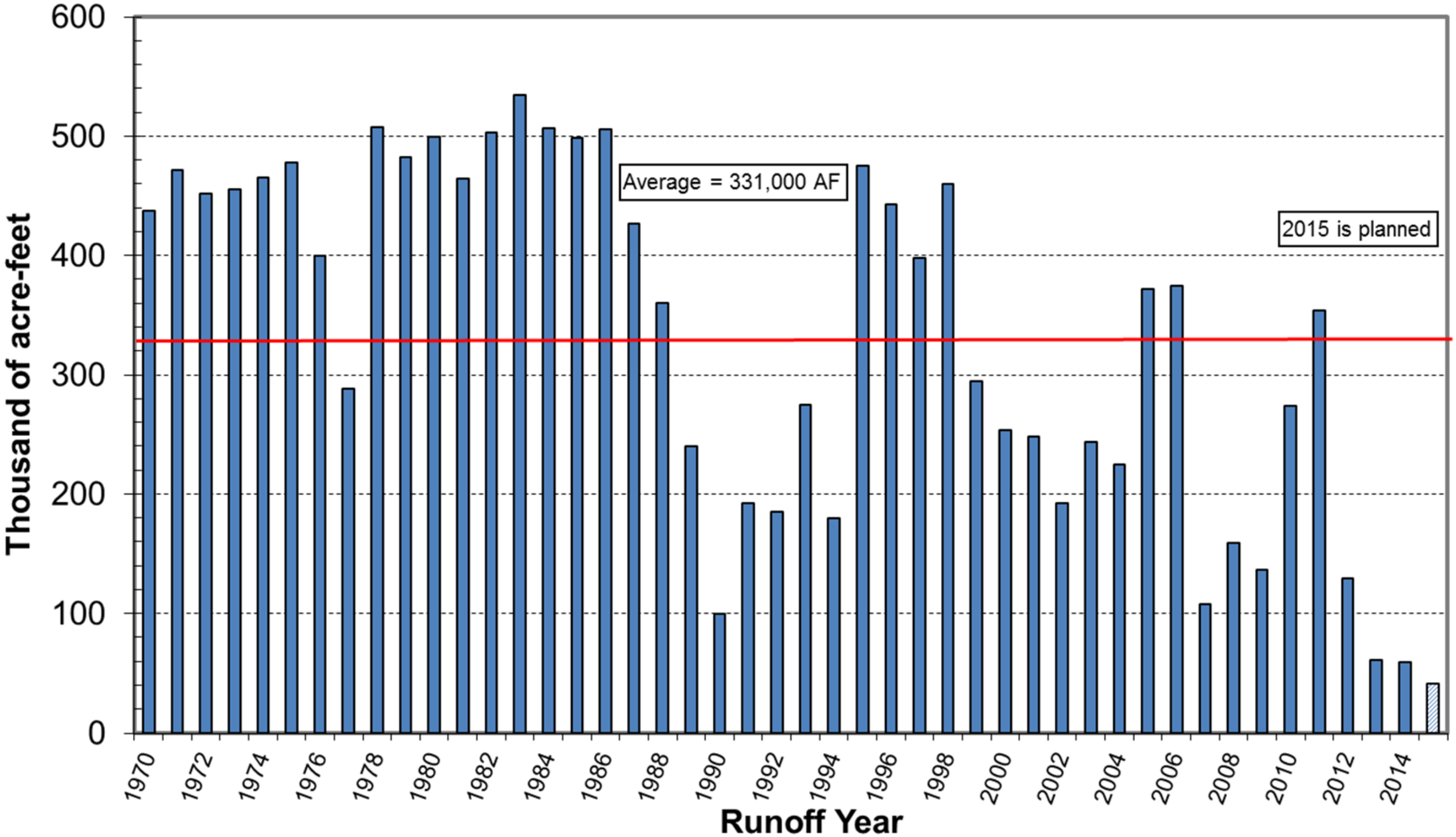

Figure 2.12 Water Export from Eastern Sierra to Los Angeles

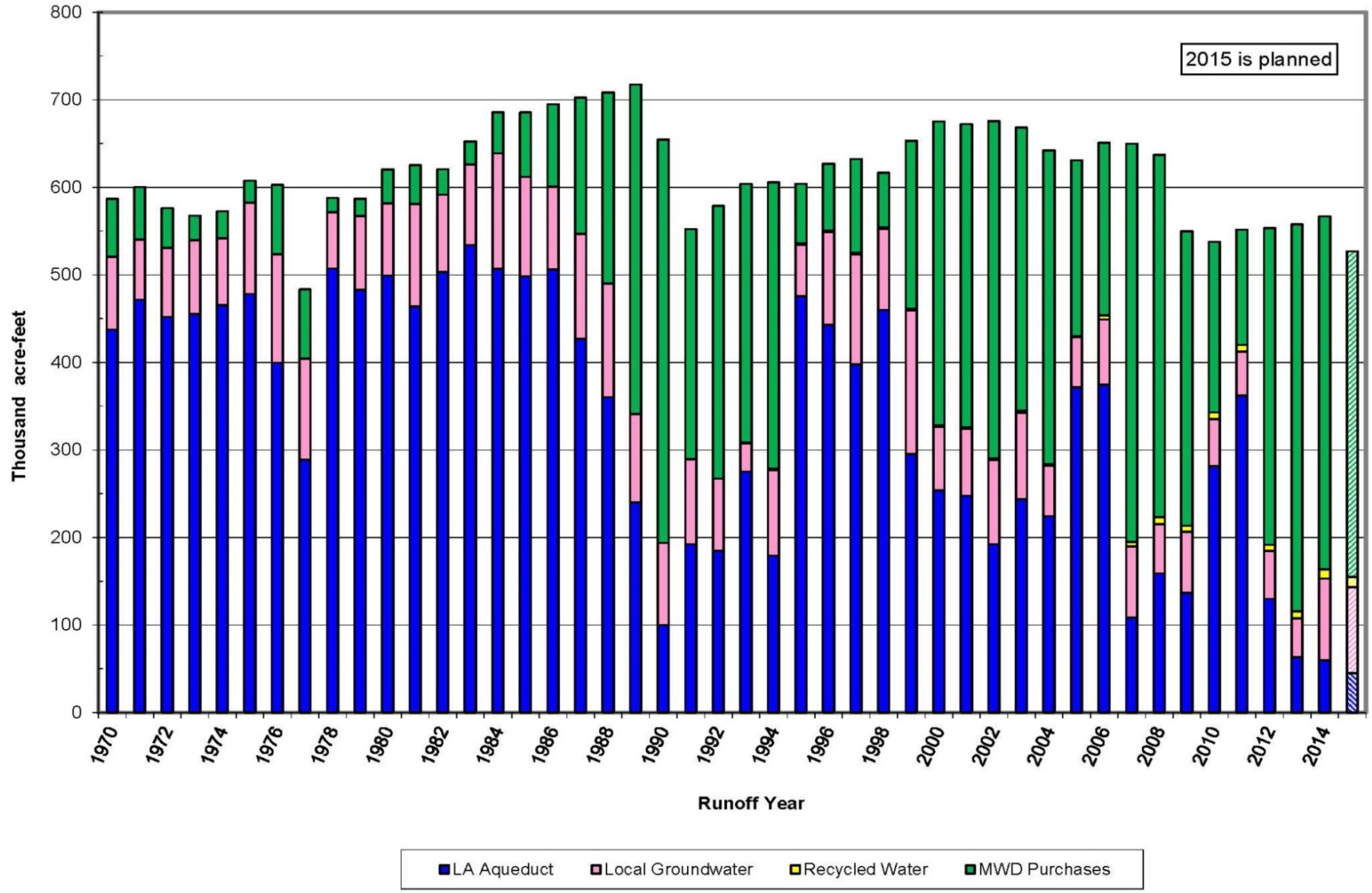

Figure 2. 13 Sources of Water for the City of Los Angeles

3. CONDITIONS IN THE OWENS VALLEY

3. CONDITIONS IN THE OWENS VALLEY

As of April 1, 2015, the Eastern Sierra overall snowpack was measured to be 4% of normal and Owens Valley floor precipitation over the 2014-15 year was about 49% of average (Tables 3.2 and 3.3). Owens Valley runoff during the 2015-16 runoff year is forecast to be 148,600 acre-feet or approximately 36% of normal (Table 2.1). Overall vegetation cover in the Owens Valley is comparable to 1980s baseline conditions. A graphical summary of Owens Valley conditions is provided in Figure 3.1. Groundwater levels are generally high in most areas of the valley.

3.1. Well ON/OFF Status

The Water Agreement includes the vegetation protection provisions of linking pumping wells to specific monitoring sites. If the available soil moisture measured at a vegetation monitoring site is not sufficient to meet the estimated demands of the vegetation associated with that monitoring site, the wells linked to that site are designated as being in the OFF status and may not be operated. The wells linked to a monitoring site may be operated if the available soil water is determined to be sufficient to have met the estimated water requirements of the vegetation at the time that the associated wells were designated as being in the OFF status. The Green Book includes the complete well ON/OFF procedures. Table 3.1 provides a listing of Owens Valley monitoring site ON/OFF status as of April 2015, the monitoring wells associated with each monitoring site, and the linked pumping wells.

Some pumping wells are designated as being exempt from linkage to vegetation sites and the ON/OFF provisions of the Water Agreement because these wells are in areas that cannot cause significant adverse impacts to the vegetation or because these wells have been determined by Inyo County and the Los Angeles Department of Water and Power (LADWP) to be a necessary source of water. A list of exempt wells and the reasons for exemption are included in Table 2.5.

3.2. Groundwater Level Hydrographs

LADWP hydrographers monitor groundwater levels in over 700 monitoring wells throughout the Owens Valley. Groundwater levels are considered when evaluating the overall condition of the basin and are utilized for calibrating groundwater models. Hydrographs are used to observe the changes in groundwater levels over time. Figures 3.2a through 3.2g illustrate hydrographs of selected monitoring wells in Owens Valley wellfields. As shown in Figures 3.2-3.8, groundwater levels are generally high in most areas of the valley considering that hydrographs show groundwater levels following three driest years with lowest runoff since LADWP has beeping record of flows in Owens Valley.

LADWP uses regression models to forecast change in depth to water. Groundwater pumping for the first six months of the 2015-16 runoff year will be contingent on environmental conditions and water needs assessed during the year. The range of planned pumping by well field is included in Table 2.3 (Section 2). Based upon the first six months of planned groundwater pumping in each wellfields during the 2015-16 runoff year, the forecast depth to water changes between April 1, 2015, and April 1, 2016, in selected Owens Valley well fields are as follows:

- Groundwater levels in the Laws Well Field are forecast to decrease between approximately 0.2 and 0.6 feet.
- Groundwater levels in the Big Pine Well Field are forecast to decrease between 0.9 and 1.1 feet.
- Groundwater levels in the Taboose-Aberdeen Well Field are forecast to decrease between 0.3 and 1.2 feet.
- Groundwater levels in the Thibaut-Sawmill Well Field are forecast to decrease between 2.1 and 2.2 feet.
- The forecast change in depth to water in the Independence-Oak Well Field ranges between a 0.1 foot increase and a 0.7 foot decrease.
- Groundwater levels in the Symmes-Shepherd Well Field are forecast to change from an increase of 0.6 feet and a decrease of 0.2 feet.
- Groundwater levels in the Bairs-Georges Well Field are forecast to decrease between 0.5 and 0.7 feet.

It should be noted that the forecasted Owens Valley runoff for 2015-16 of 36% of normal is well below the ranged runoff values that were used in developing the regression models for predicting changes in groundwater levels. Therefore, the predicted groundwater levels will be less reliable than years within the range that the regression models were developed with.

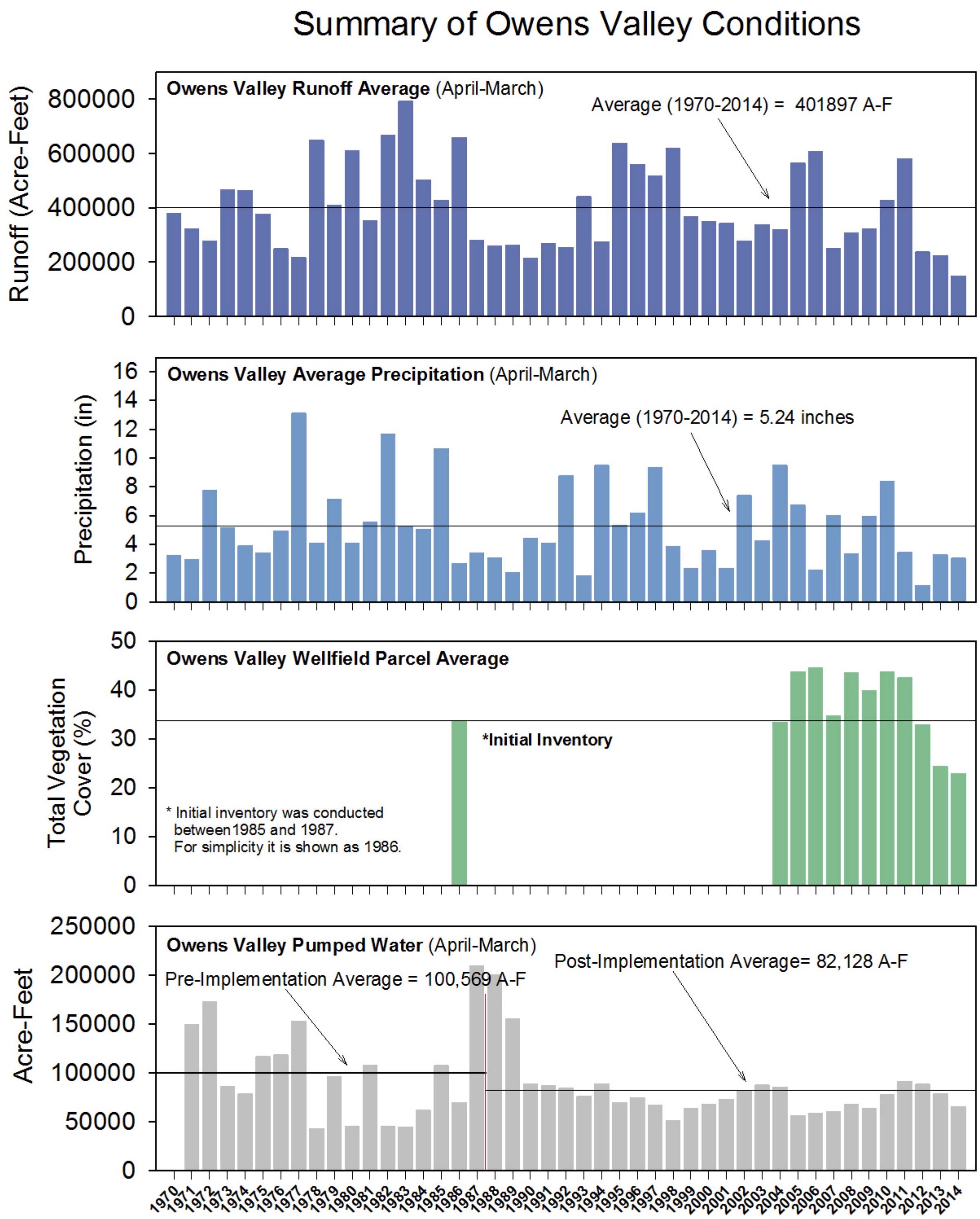

Figure 3. 1 Summary of Owens Valley Conditions

Table 3. 1 Owens Valley Monitoring Site Status (ON/OFF) as of April 2015

Wellfield	Monitoring Site	Monitoring Well	Pumping Wells	E/M Wells	ON/OFF Status
Laws	L1	795T	247, 248, 249, 398		OFF
	L2	USGS 1	236*, 239, 243, 244		ON
	L3		240, 241, 242	376, 377	OFF
	L4a, L4b			385, 386	na
	L5**		245	387, 388	na
	Exempt		236*, 354, 365, 413		Exempt
Bishop	All wells		140, 411, 410, 371		na
			406, 407, 408, 412		na
Big Pine	BP1	798T	210, 352	378, 379, 389	OFF
	BP2	799T	220, 229, 374	375	OFF
	BP3	567T	222, 223, 231, 232		OFF
	BP4	800T	331		ON
	Exempt		218, 219, 330, 332, 341, 352, 415		Exempt
Taboose-Aberdeen	TA3	505T	106, 110, 111, 114		OFF
	TA4	586T	342, 347		OFF
	TA5	801T	349		ON
	TA6	803T	109, 370		OFF
	Exempt		118		Exempt
Thibaut-Sawmill	TS1	807T	159		OFF
	TS2	T806	155		ON
	TS3	454T	103, 104	382	OFF
	TS4	804T		380, 381	OFF
	Exempt		351, 356		Exempt
Independence-Oak	IO1	809T	391, 400		OFF
	IO2	548T	63		OFF
	Exempt		59, 60, 61, 65, 401, 357, 384*	383, 384	Exempt
Symmes-Shepherd	SS1	USGS 9G	69, 392, 393		ON
	SS2	646T	74, 394, 395		OFF
	SS3	561T	92, 396		OFF
	SS4	811T	75, 345		OFF
	Exempt			402	Exempt
Bairs-Georges	BG2	812T	76, 343*, 348, 403		ON
	Exempt		343*		na
Lone Pine	Exempt		344, 346	390	Exempt
	Other		416		na

*dual use

** Monitoring site has not yet been located.

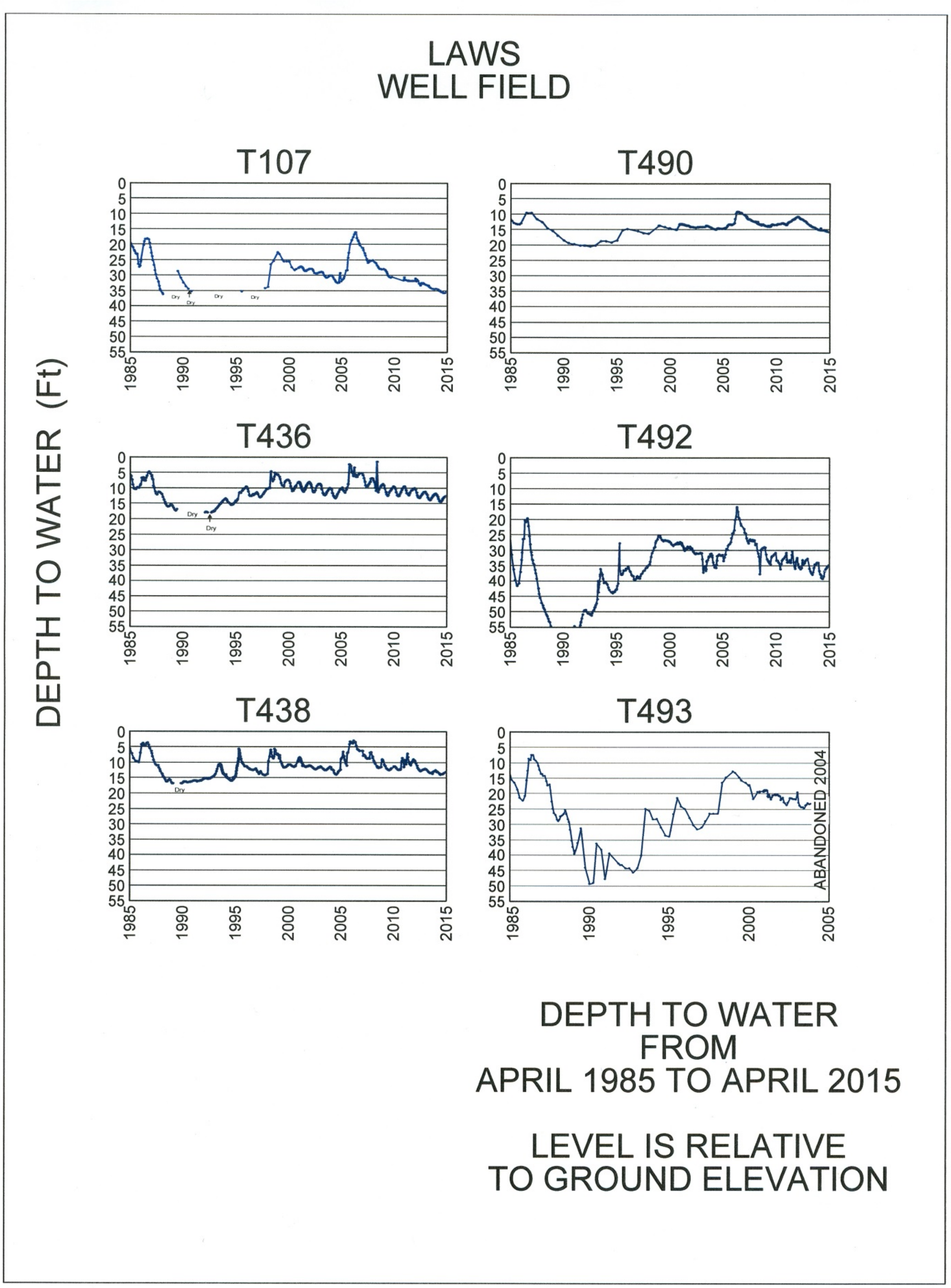

Figure 3. 2 Depth to Water Hydrographs for Laws Wellfield

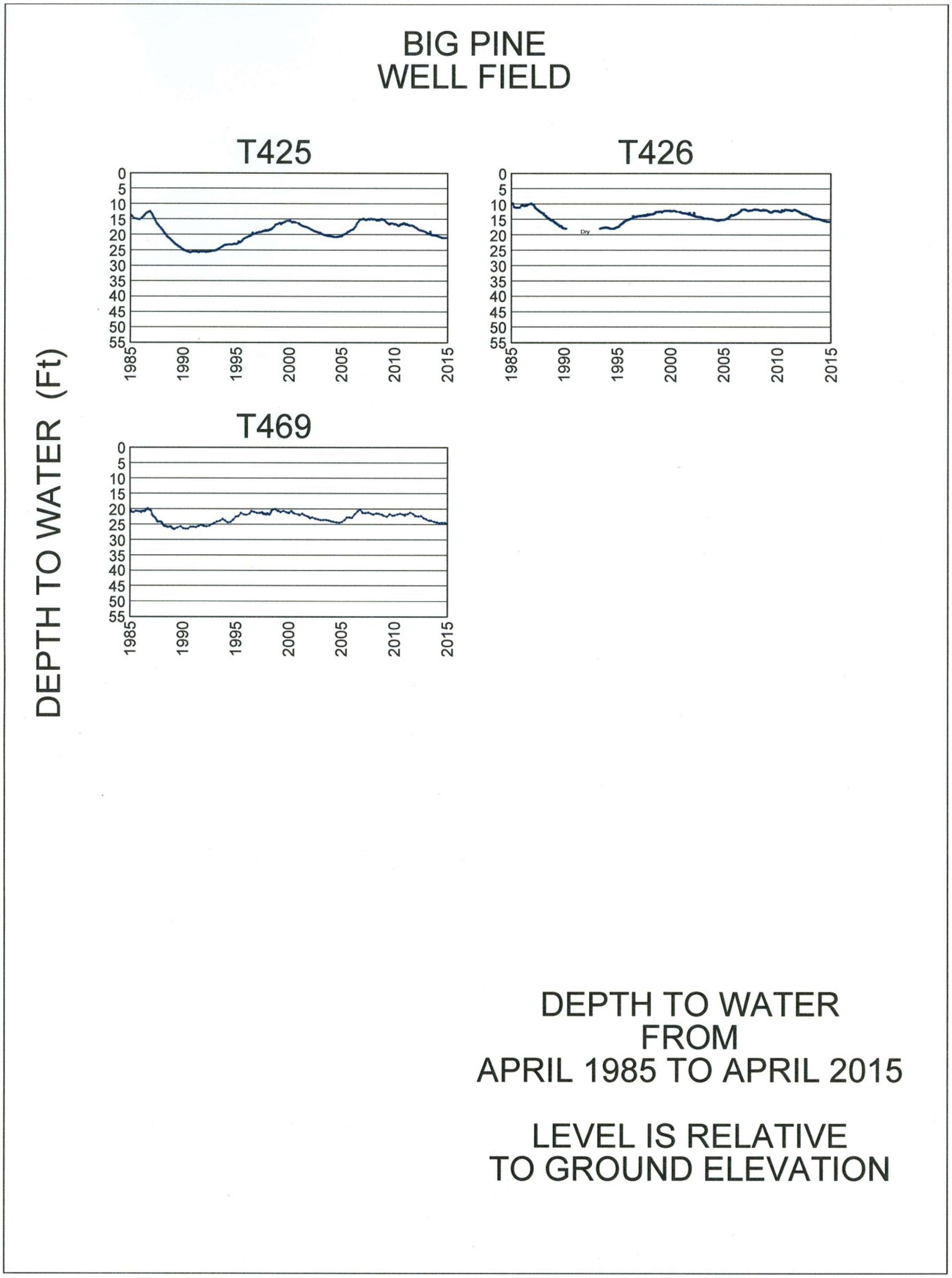

Figure 3. 3 Depth to Water Hydrographs for Big Pine Wellfield

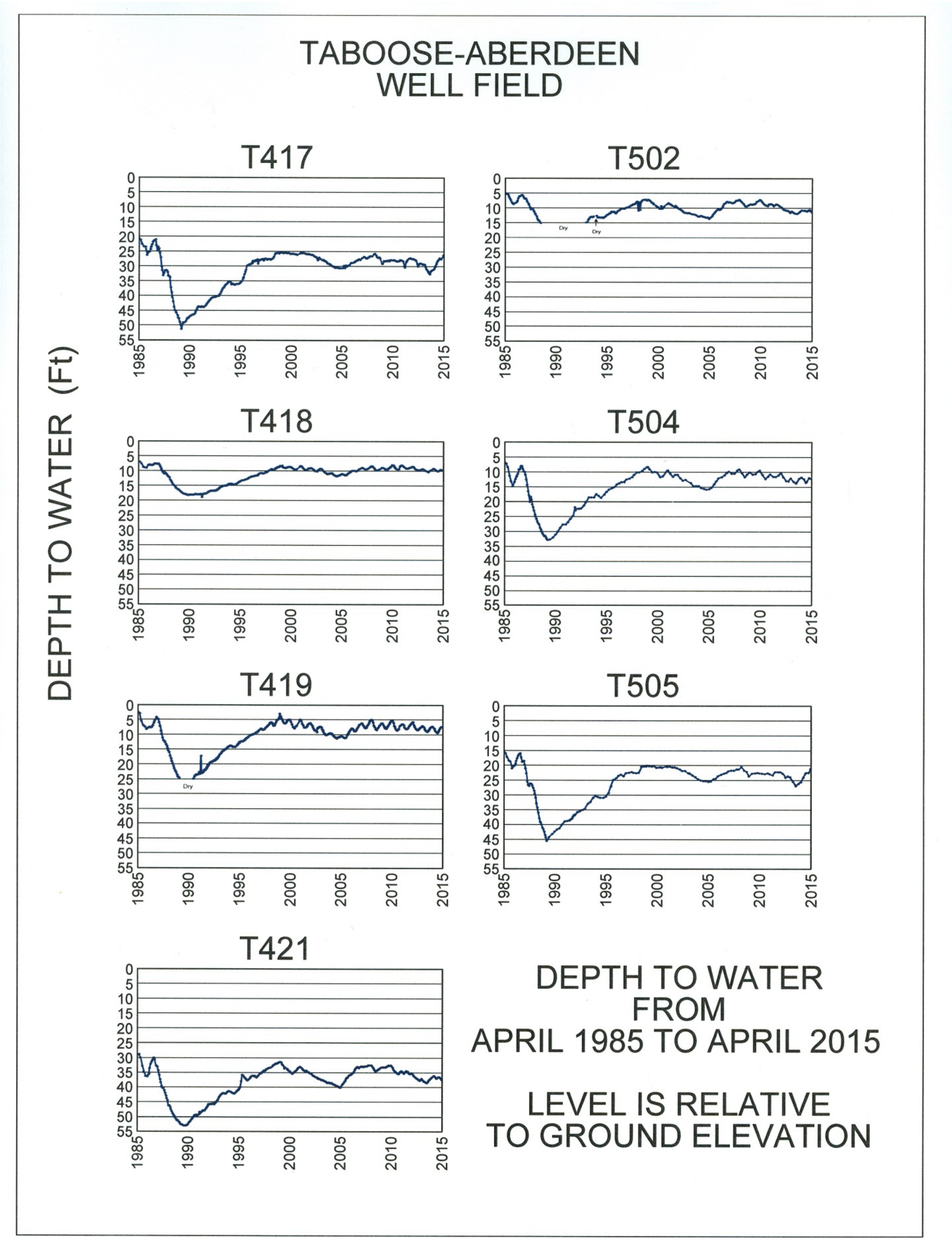

Figure 3. 4 Depth to Water Hydrographs for Taboose-Aberdeen Wellfield

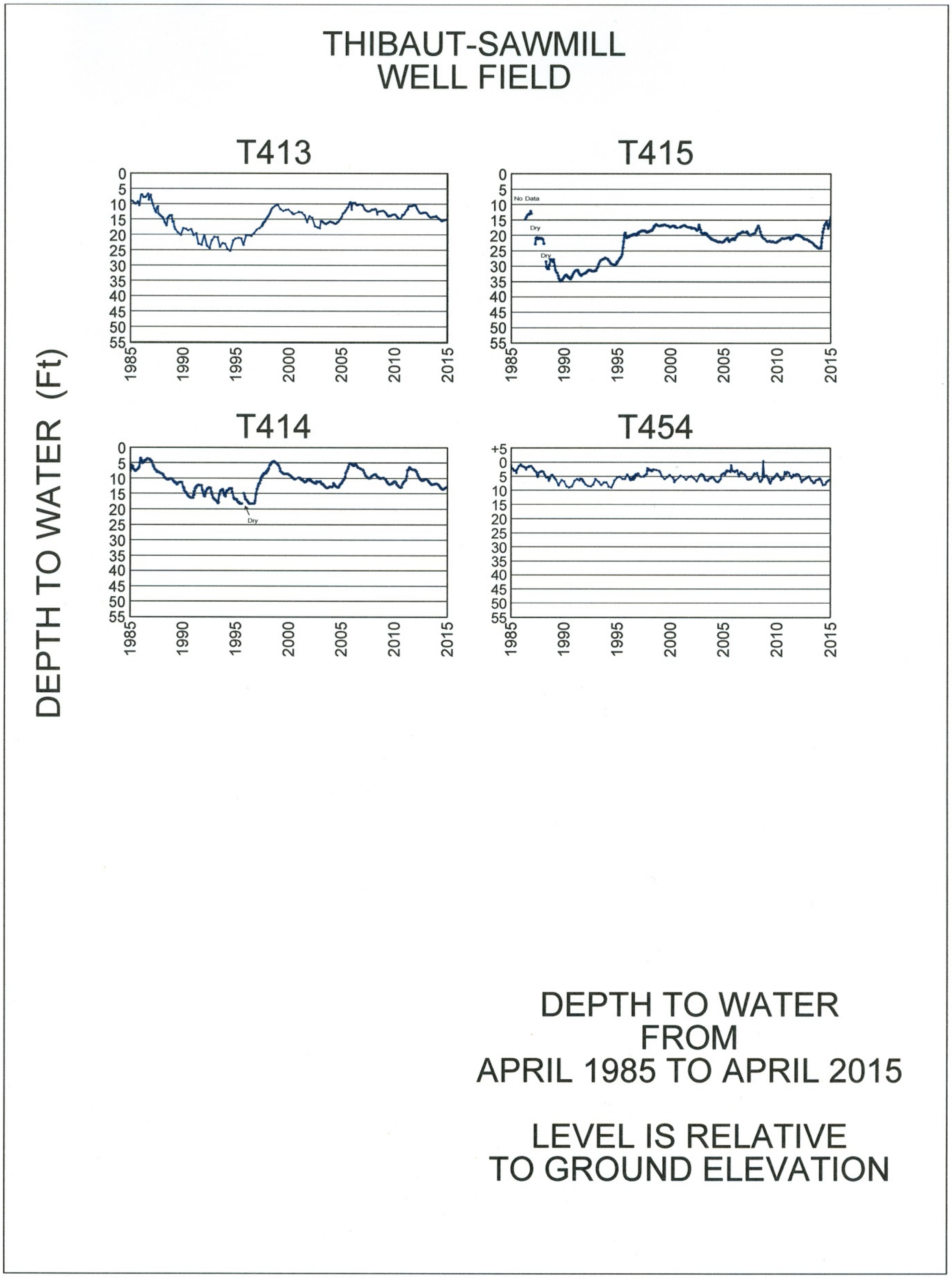

Figure 3. 5 Depth to Water Hydrographs for Thibaut-Sawmill Wellfield

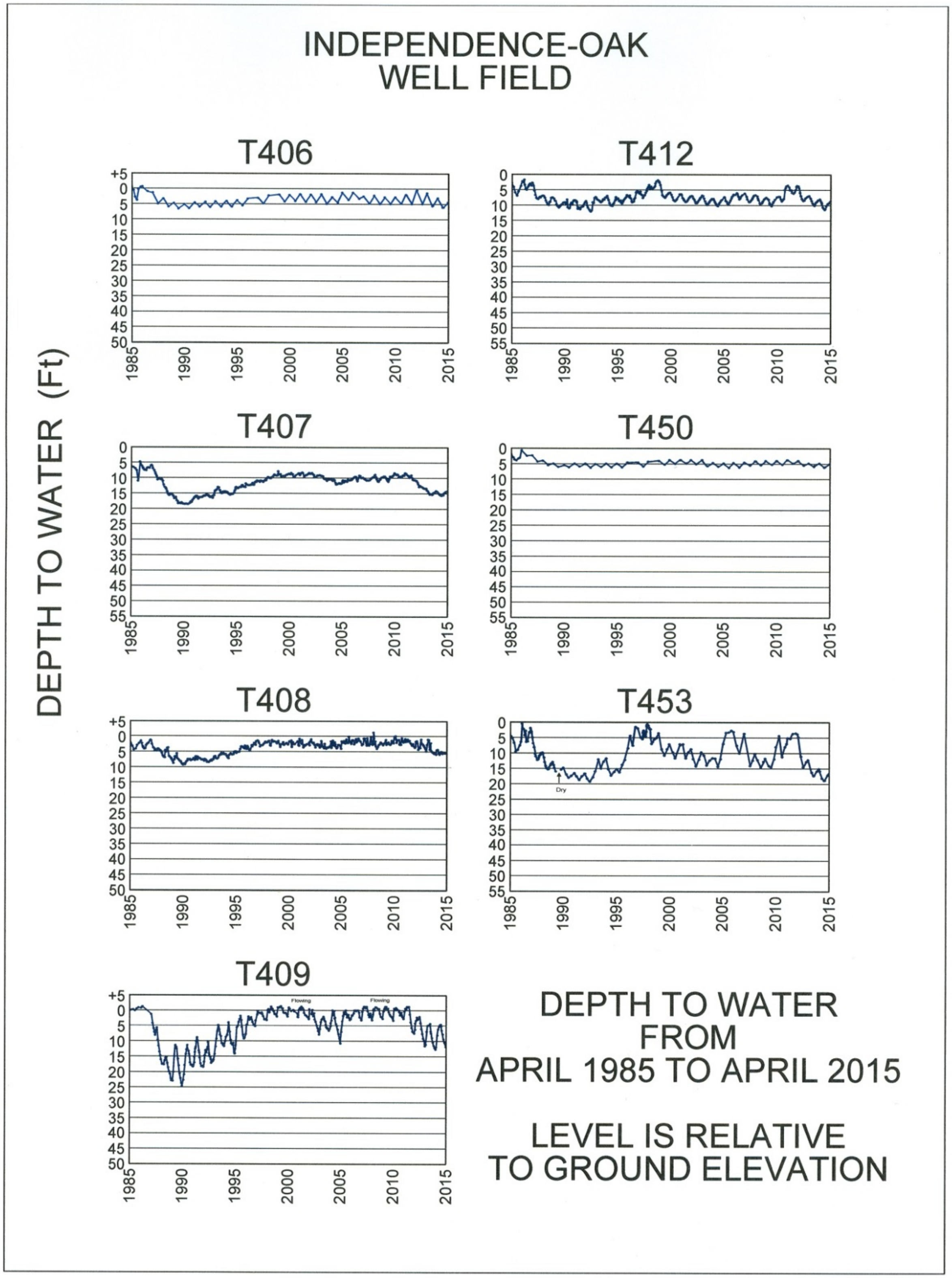

Figure 3. 6FIGURE 3.2e Depth to Water Hydrographs for Independence-Oak Wellfield

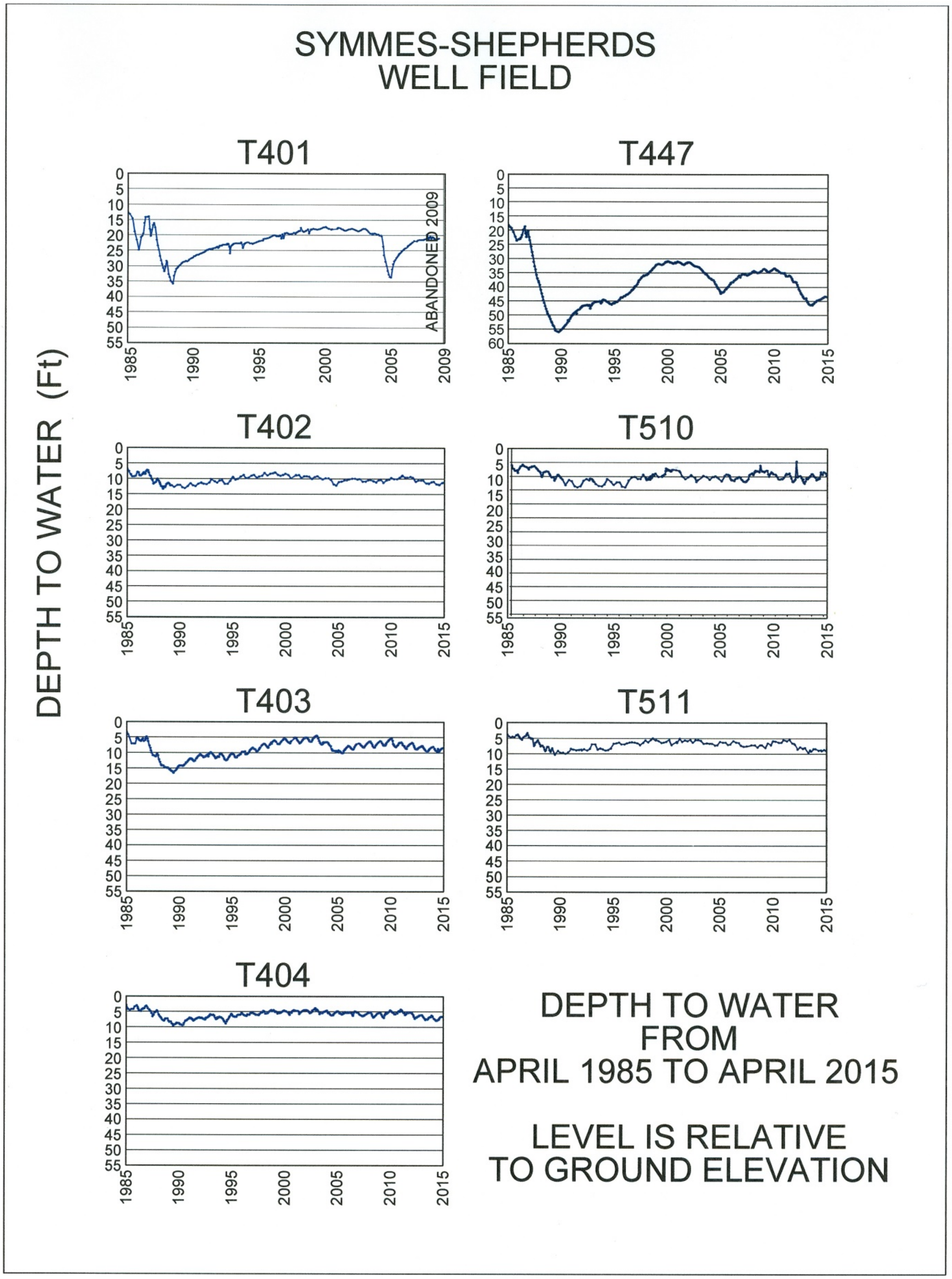

Figure 3. 7 Depth to Water Hydrographs for Symmes-Shepard Wellfield

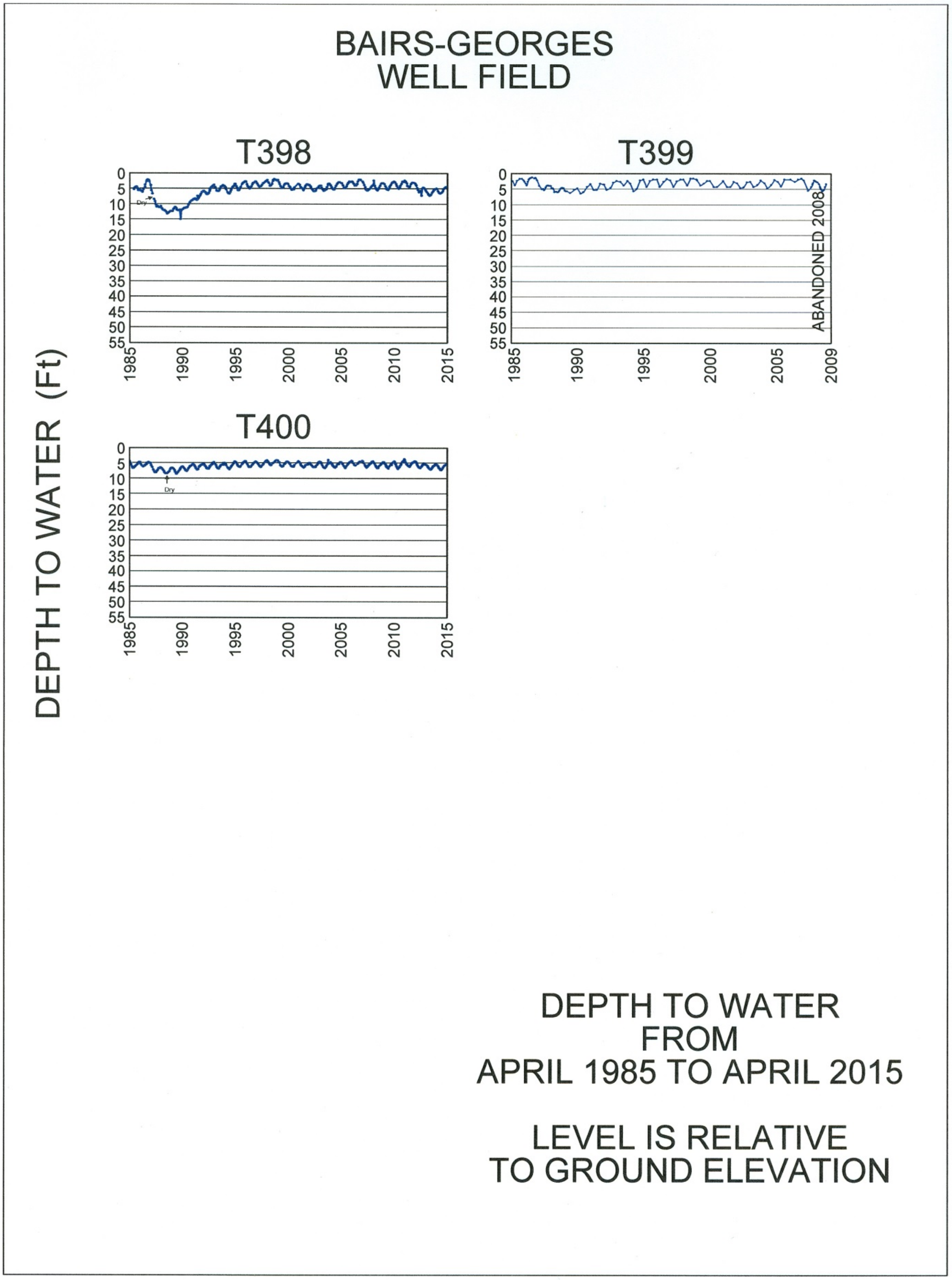

Figure 3. 8 Depth to Water Hydrographs for Bairs-Georges Wellfield

3.3. Precipitation Record and Runoff Forecast

The Eastern Sierra snowpack as of April 1, 2015 was 3% of normal in the Mammoth Lakes area, 1% of normal in the Rock Creek area, 5% of normal in the Bishop area, 8% of normal in the Big Pine area, and 4% of normal in the Cottonwood Lakes area. The Eastern Sierra overall snowpack, weighted by contribution to Owens River runoff was calculated to be 4% of the normal snowpack as of April 1, 2015, (Table 3.2).

The Eastern Sierra runoff forecast for the 2015-16 runoff year is 148,600 acre-feet or 36% of normal (Table 2.1). Figure 3.9 compares the forecast runoff for the 2015-16 year to previous runoff years.

Average precipitation on the valley floor for the 2014-15 year was 2.91 inches, which is less than half the fifty-year average of 5.9 inches. Table 3.2 details monthly annual precipitation totals for the 2014-15 runoff year as well as the long-term averages throughout the Owens Valley.

Table 3. 2 Eastern Sierra April 1, 2015 Snow Survey Results

EASTERN SIERRA SNOW SURVEY RESULTS
April 1, 2015

MAMMOTH LAKES AREA (Contributes 25% of Owens River Basin runoff)

Course	Water Content	April 1 Normal	Percent of Normal
Mammoth Pass	1.4	43.5	3%
Mammoth Lakes	0.0	21.1	0%
Minarets 2	1.0	30.1	3%
Mammoth Lakes Area Average:	**0.8**	**31.5**	**3%**

ROCK CREEK AREA (Contributes 16% of Owens River Basin runoff)

Course	Water Content	April 1 Normal	Percent of Normal
Rock Creek 1	0.0	7.4	0%
Rock Creek 2	0.0	10.5	0%
Rock Creek 3	0.2	14.4	1%
Rock Creek Area Average:	**0.1**	**10.8**	**1%**

BISHOP AREA (Contributes 20% of Owens River Basin runoff)

Course	Water Content	April 1 Normal	Percent of Normal
Sawmill*	1.0	19.7	5%
Bishop Area Average:	**1.0**	**19.7**	**5%**

BIG PINE AREA (Contributes 13% of Owens River Basin runoff)

Course	Water Content	April 1 Normal	Percent of Normal
Big Pine Creek 2	0.8	13.9	6%
Big Pine Creek 3	1.8	18.6	10%
Big Pine Creek Area Average:	**1.3**	**16.3**	**8%**

COTTONWOOD AREA (Contributes 25% of Owens Basin River runoff)

Course	Water Content	April 1 Normal	Percent of Normal
Cottonwood Lakes 1	0.5	13.0	4%
Trailhead**	0.7	13.7	5%
Cottonwood Area Average:	**0.6**	**13.3**	**4%**

EASTERN SIERRA OVERALL SNOW PACK (Weighted by contribution to Owens River Basin runoff)

Average	Water Content	April 1 Normal	Percent of Normal
Average of all Snow Courses	**0.7**	**19.2**	**4%**

Normals are based on the 1961-2010 period.
* Measured by Dept of Water Resources
** Trailhead has only been measured since 1982, so the normal is estimated.

PSS 4/1/2015

Table 3. 3 Owens Valley Precipitation During Runoff Year 2014-15 in Inches

Month	Bishop	Big Pine	Tinemaha Reservoir	LAA Intake	Indep. Yard	Alabama Gates	Lone Pine	Cotton-wood	South Haiwee	Average Owens Valley
April, 2014	0.15	0.12	0.06	0.03	0.04	0.00	0.01	0.00	0.00	0.05
May	0.34	0.84	0.50	0.30	0.06	0.03	0.27	0.04	0.09	0.27
June	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
July	0.12	0.02	0.21	0.49	0.46	0.31	0.10	0.05	0.11	0.21
August	0.23	0.51	0.19	0.79	1.00	1.55	0.91	0.98	0.50	0.74
September	0.18	0.12	0.03	0.00	0.07	0.22	0.22	0.17	0.03	0.12
October	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
November	0.01	0.05	0.00	0.04	0.01	0.05	0.04	0.09	0.02	0.03
December	0.49	0.74	0.63	0.85	0.68	0.90	0.86	1.18	1.74	0.90
January, 2015	0.01	0.06	0.09	0.06	0.14	0.22	0.84	0.35	0.54	0.26
February	0.14	0.42	0.47	0.24	0.31	0.31	0.13	0.02	0.15	0.24
March	0.00	*0.00*	0.28	0.07	0.12	0.13		0.05	0.17	0.10
2014-15 Total	*1.67*	*2.88*	*2.46*	*2.87*	*2.89*	*3.72*	*3.38*	*2.93*	*3.35*	*2.91*
Average*	6.37	6.46	6.76	5.76	5.48	4.03	4.01	6.89	7.31	5.90
% of Average	26%	45%	36%	50%	53%	92%	84%	43%	46%	49%

* Average for 1960 to 2010 runoff year

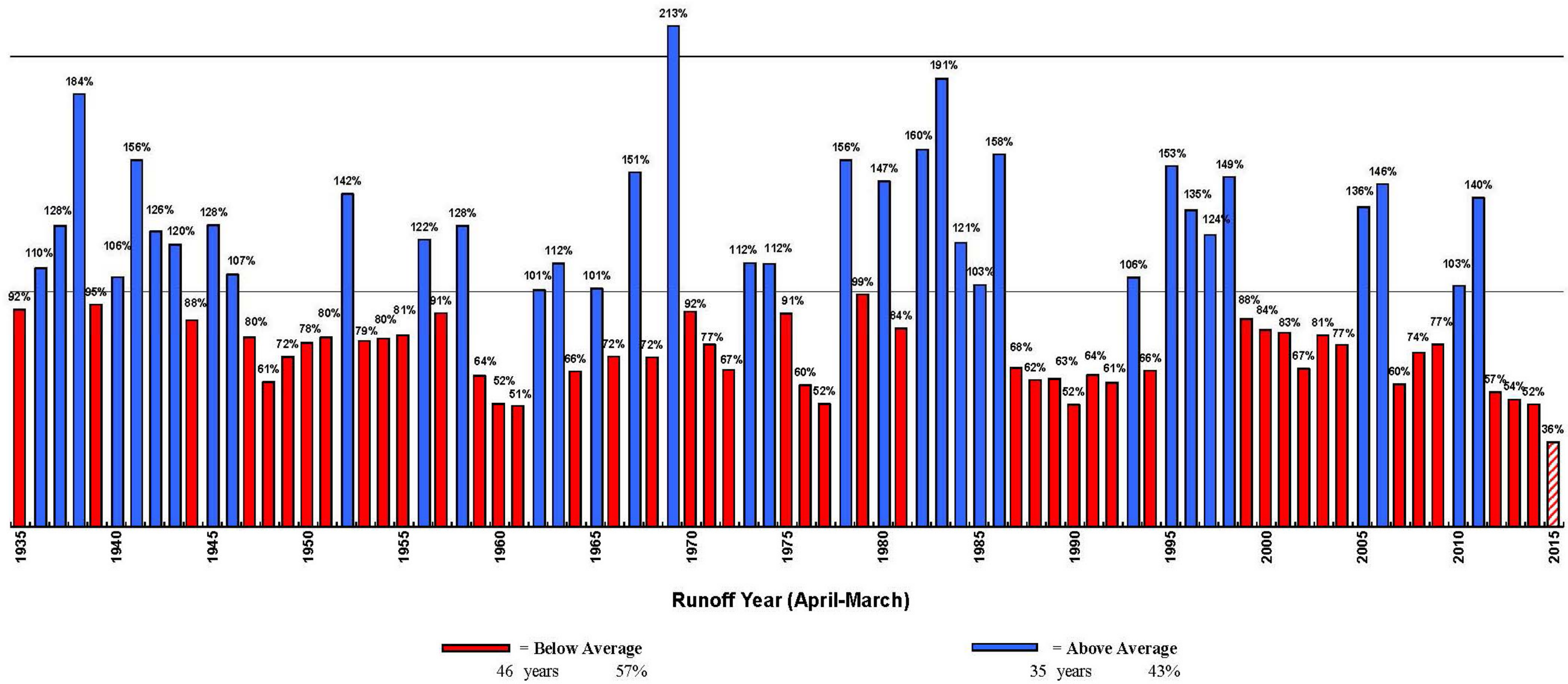

Figure 3. 9 Owens Valley Runoff – Percent of Normal

3.4. Owens Valley Water Supply and Use

Table 3.4 provides an overview of the Owens Valley water supply, in-valley uses and losses, and Los Angeles Aqueduct (LAA) exports for the post-Water Agreement period (1992-93 through 2014-15 runoff years) as compared to the pre-project average (pre-Second Los Angeles Aqueduct) and projected water supply and uses (based on the Water Agreement, 1991 EIR, and 1997 MOU). Actual water uses in the Owens Valley are generally consistent with the projected values under the 1991 EIR and 1997 MOU with the notable exception of significant diversions to the OLDMP. While the average Owens Valley water supply (surface water flow, flowing wells, and pumped groundwater) has remained about the same over time, exports are considerably less than anticipated under the 1991 EIR and 1997 MOU. The fundamental reasons for this reduction in the municipal water supply are increased uses within Owens Valley for dust abatement, mandated decreases in water exported from the Mono Basin, and less groundwater pumping than anticipated under the Water Agreement.

Current Owens Valley water uses are compared to pre-Water Agreement uses as well as those uses projected under the Water Agreement and 1997 MOU in Figure 3.10. The components of LADWP's water exports from the Eastern Sierra are compared to pre-Water Agreement exports as well as those projected under the Water Agreement and 1997 MOU in Figure 3.11.

Table 3.5 provides a breakdown of Owens Valley water uses from 1985 to the present and planned water uses for the 2015-16 runoff year. While much of Table 3.5 is self-explanatory, the following items bear additional explanation:

- Enhancement/mitigation (E/M) water supply is the water supplied to E/M projects referenced in the 1991 EIR,
- LORP is water supplied to the Lower Owens River Project,
- Owens Lake Release tracks water supplied to the Owens Lake Dust Mitigation Program,
- Operations is water used for operational reasons.

Table 3.6 lists a breakdown of water supplied to E/M projects during the 2014-15 runoff year.

Table 3. 4 Owens Valley Water Supply and Uses

(Amounts in Thousands of Acre-Feet/Year)

	Pre-Project (Pre Water Agreement)	Projected per MOU/ Agreement	Actual Data for Runoff Year 2014-2015	Actual Post Water Agreement Averages (1992-2015)
Owens Valley Water Supply				
Runoff (Owens Valley & Round Valley)	319 (1)	310	158	287
Flowing Wells	44	15	32	33
Pumped Groundwater	10	110 (2)	65	73
Total	373	435	255	393
In-Valley Uses & Losses				
City Water Used in O.V.				
Irrigated Lands (3)	62	46	43	48
Stockwater, Wildlife, and Rec. Uses (4)	20	23	19	22
Post 1985 E/M Projects (5)	0	12	10	10
Lower Owens River (6)	0	36 (7)	14	19 (8)
Additional Mitigation (1,600 af from MOU)	0	2	2	2 (8)
Owens Lake	0	0	54	68 (8)
Sub-Total	82	119	142	169
Other O.V. Uses and Losses (9)	134	122	147	109
Total	216	241	289	278
Components of Aqueduct Export				
Owens Valley Contribution to Export	103	210	-(34)	115
Long Valley Contribution to Export	149	149	84	139
Mono Basin Contribution to Export (10)	95	30	16	16 (8)
Total	347	389	66	276

1. Average runoff for period 1935 to 1988 (Runoff Year)
2. Assumed based on 1991 O.V. Groundwater Pumping EIR
3. Does not include areas receiving water supplies non-tributary to the Owens River/Aqueduct (approx. 7,000 AFY).
4. Includes projects such as the Tule Elk Field, Farmers Ponds implemented after 1970 and before 1985 when E/M projects commenced. Also includes the LORP Off-River Lakes and Ponds uses.
5. Except Lower Owens River Rewatering E/M Project
6. Includes river losses, and releases to the Blackrock Waterfowl Habitat Area and the Delta
7. Assumes: 6,500 AF year-round flow to delta, 3,000 AF to Blackrock, and 26,500 AF for other losses.
8. Represents recent history.
9. Includes uses on private lands, conveyance losses, recharge, evaporation, and operation releases.
10. 1993 Court decision allows approximately 30,000 AFY when lake reaches elevation 6392. Prior to Court decision Mono Basin export averaged 95,000/yr.

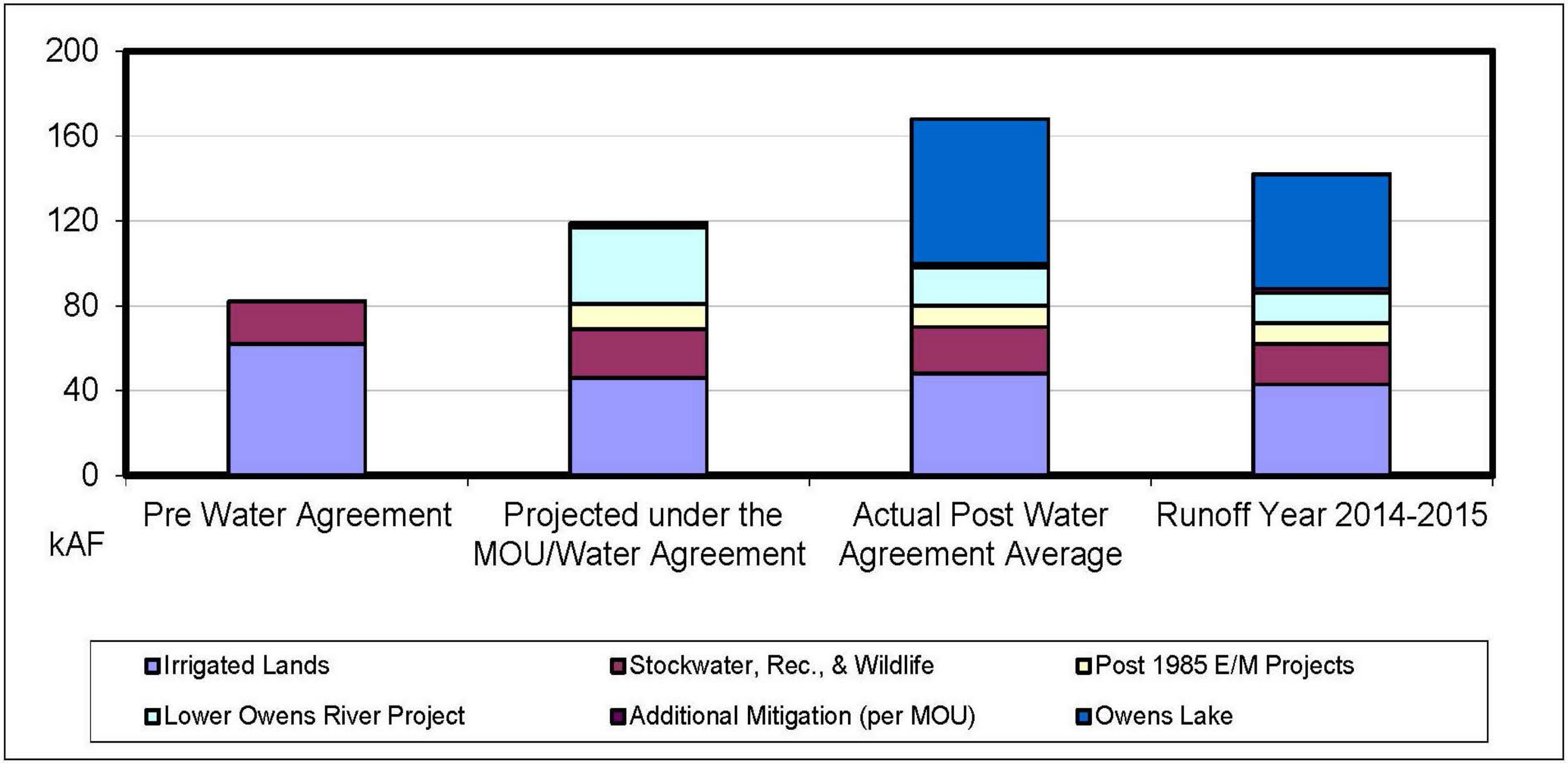

Figure 3. 10 Owens Valley Water Uses

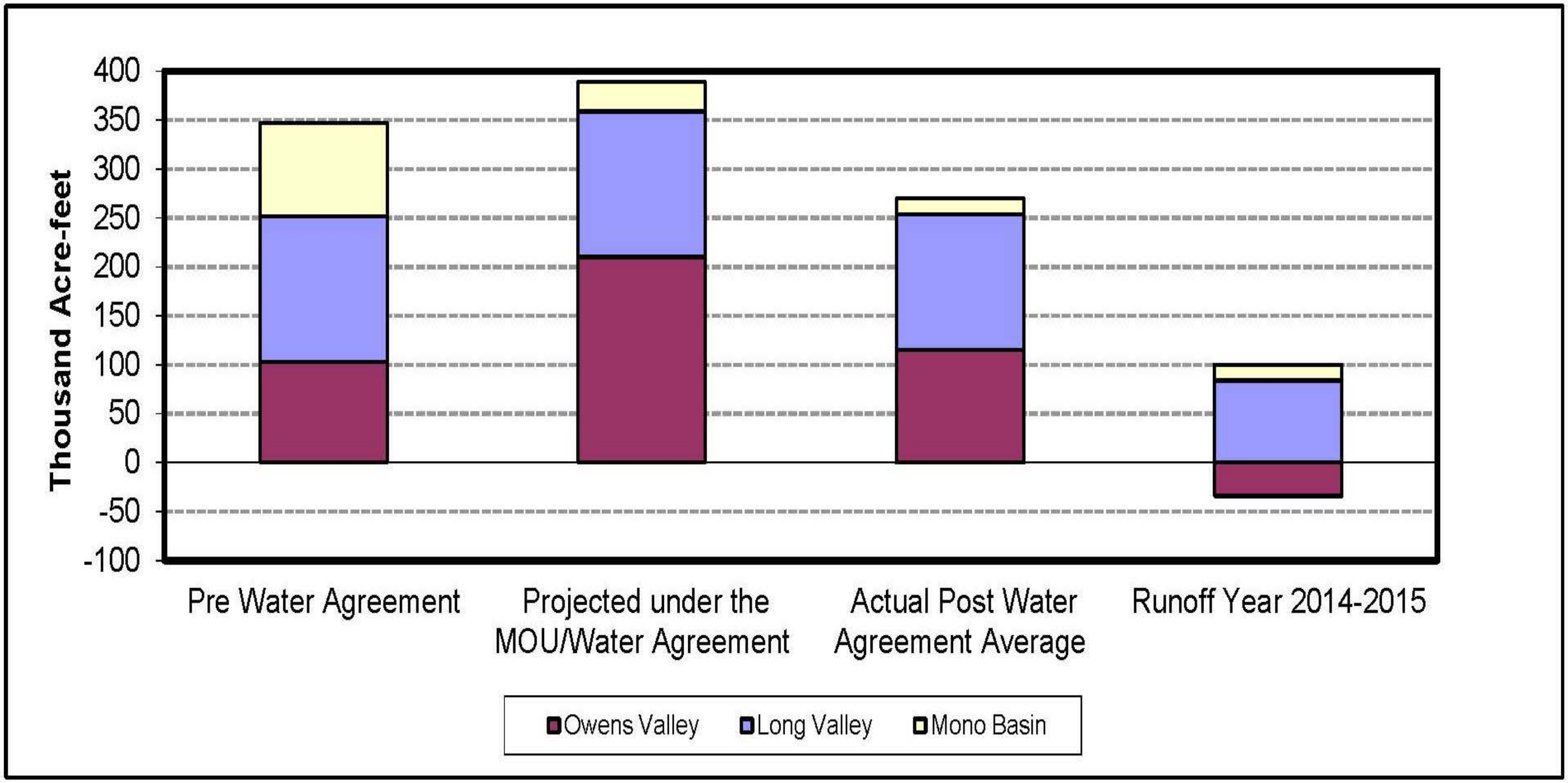

Figure 3. 11 Components of the Eastern Sierra Water Exports

Table 3. 5 Owens Valley Water Uses for 1985-86 through 2014-15 and Planned Uses for the 2015-16 Runoff Year (acre-feet)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	Groundwater Recharge		(14)	(15)
Runoff Year	Owens Valley Runoff %	Owens Valley Pumping (1000 af)	Irrigation	Stock Water	E/M	Rec. & Wildlife	Indian Land Uses	LORP	1600 AF Projects	Owens Lake Release	In-Valley Uses (sum of 4+5+6+7+8+9+10+11)	(13a) Big Pine & Independence Spreading	(13b) Laws Spreading	Operations	All Uses (sum of 12+13+14)
1985-86	103	108	47,390	15,394	109	9,205	4,248	4,191			80,537	4,822	4,068	13,712	103,139
1986-87	158	70	47,884	15,125	1,610	9,735	3,873	12,551			90,778	67,251	20,429	72,387	250,845
1987-88	68	209	48,679	15,443	13,818	6,420	3,902	15,542			103,804	0	0	7,499	111,303
1988-89	62	200	46,463	14,381	17,102	8,429	5,299	13,856			105,530	0	0	6,705	112,235
1989-90	63	156	48,232	13,922	15,261	8,669	5,460	8,069			99,613	0	0	8,935	108,548
1990-91	52	89	46,424	14,360	9,242	9,983	5,445	8,657			94,111	0	0	5,312	99,423
1991-92	64	87	42,112	14,662	8,301	9,143	5,938	10,251			90,407	0	0	9,923	100,330
1992-93	61	84	37,131	17,828	9,088	7,725	5,211	9,269			86,252	0	0	12,179	98,431
1993-94	105	76	47,798	17,230	13,443	8,676	5,270	5,867			98,284	14,512	10,640	12,433	135,869
1994-95	66	89	37,790	17,178	9,132	8,116	5,641	11,680			89,537	0	56	12,102	101,695
1995-96	153	70	57,748	20,919	11,162	12,479	5,170	11,752			119,230	30,126	21,148	13,561	184,065
1996-97	135	75	46,171	19,757	10,989	9,438	5,540	12,960			104,855	4,606	0	21,125	130,586
1997-98	124	67	47,114	16,422	8,114	8,022	5,548	13,494			98,714	4,113	4,106	13,874	120,807
1998-99	149	52	45,445	13,654	9,075	8,691	4,589	10,597			92,051	24,970	31,077	23,016	171,114
1999-00	89	64	49,529	14,461	8,836	7,470	4,232	15,616			100,144	0	0	11,263	111,407
2000-01	84	68	49,327	13,442	7,989	7,263	5,792	12,793			96,606	0	790	12,517	109,913
2001-02	83	73	43,296	12,759	9,401	7,487	4,931	12,414			90,288	0	230	12,973	103,491
2002-03	66	82	43,929	12,291	11,442	7,377	4,922	9,952		22,983	112,896	0	0	8,431	121,327
2003-04	81	88	45,974	11,620	10,926	6,853	5,293	10,190		27,049	117,905	0	0	8,787	126,692
2004-05	77	86	50,311	11,546	9,915	6,866	4,739	9,003		28,981	121,361	243	695	9,536	131,835
2005-06	136	57	53,832	11,355	11,587	7,807	3,281	7,769		31,643	127,274	16,212	24,187	14,814	182,487
2006-07	146	59	50,968	12,041	11,551	7,849	3,315	11,700		42,542	139,966	29,457	16,855	38,937	225,215
2007-08	61	60	47,699	12,161	11,565	10,122	2,931	22,501		66,580	173,559	0	0	5,631	179,190
2008-09	74	69	56,130	11,435	10,646	8,479	3,527	20,957		61,326	172,500	1,342	0	7,651	181,493
2009-10	77	65	52,933	11,450	10,695	10,398	4,142	15,708		66,940	172,266	0	0	8,453	180,719
2010-11	103	80	52,983	12,275	10,807	12,106	3,703	17,020		75,267	184,161	2,993	1,973	14,280	203,407
2011-12	140	92	62,391	11,566	11,847	9,702	3,156	19,556		74,031	192,249	13,231	4,119	8,785	218,384
2012-13	57	89	48,763	10,961	9,257	9,254	2,690	20,927	1,612	75,450	178,914	0	0	4,081	182,995
2013-14	*54*	79	44,160	11,161	8,222	8,022	3,333	17,845	1,625	67,948	162,316	0	0	1,926	164,242
2014-15	*52*	65	*43,500*	*11,500*	*9,520*	*7,400*	*3,200*	*14,300*	*1,600*	*53,700*	*144,720*	*14*	*0*	*1,750*	*146,484*
2015-16	*36*	*70*	*16,500*	*10,200*	*9,500*	*7,400*	*3,200*	*15,300*	*1,600*	*60,700*	*124,400*	*0*	*0*	0	*124,400*
AVG.	90	86	47,052	13,823	10,005	8,600	4,436	12,977	1,612	66,882	121,459	6,900	4,528	12,986	145,873

NOTES:
2015 PUMPING IS ESTIMATED FOR THE YEAR. PLANNED PUMPING FOR THE FIRST SIX MONTHS OF THE 2015-16 RUNOFF YEAR IS ON TABLE 3 IN SECTION 2.
PUMPING 1987 TO PRESENT INCLUDES E/M PUMPING
2015-16 REFLECTS CURRENT YEAR OPERATIONS FORECAST
E/M EXCLUDES RELEASES TO THE LORP
LORP IS RECORD OF THE REWATERING E/M (1985-2006) AND THE MITIGATION PROJECTS (STARTED IN DECEMBER 2006)
LORP RECORD INCLUDES RIVERINE LOSS, RELEASES TO BLACKROCK WATERFOWL, AND RELEASES TO DELTA
LORP OFF-RIVER LAKES & PONDS USE OF 2,230 AF IS INCLUDED IN REC & WILDLIFE.
TOTAL INDIAN LAND USES ARE THE SUM OF LADWP-SUPPLIED SURFACE WATER AND TRIBAL SURFACE WATER DIVERSIONS AND PUMPING FOR THE BISHOP, BIG PINE, AND LONE PINE RESERVATIONS. HOWEVER, COLUMN (8) REPRESENTS ONLY LADWP SUPPLIED SURFACE WATER.

Table 3. 6 Water Supplied to Enhancement/Mitigation Projects During 2014-15

Project	Water Supplied (acre-feet)
McNally Canals Conveyance Losses	315
McNally/Laws/Poleta Native Pasture Lands	1,376
McNally Ponds	0
Laws Historical Museum	119
Klondike Lake	1,600
Big Pine Regreening	103
Lower Owens River Rewatering	--
Independence Pasture Lands	1,932
Independence Springfield	1,427
Independence Ditch System	343
Independence Woodlot	186
Independence Regreening	63
Shepherd Creek Alfalfa Lands	980
Lone Pine Park/Richards Field	429
Lone Pine Woodlot	74
Lone Pine Van Norman Field	343
Lone Pine Regreening	233
Total E/M Uses	9,523

3.5. Owens Valley Vegetation Conditions

Vegetation conditions within the Owens Valley are monitored using vegetation transects as well as other methods. The Green Book describes the methodology and purposes of vegetation transects. As stated in the Green Book: "Vegetation transects are included within the Green Book to serve two purposes: 1) to estimate transpiration from a monitoring site, and 2) for use in determining whether vegetation has decreased or changed significantly from the previous cover." A reference for comparison of vegetation changes is the 1984-87 vegetation inventory data.

The Green Book requires the 1984-87 vegetation inventory to be used as a baseline when determining whether vegetation cover and/or species composition has changed. The 1984-1987 inventory transects were chosen using aerial photos to aid in determining transect locations. Transects were located visually by choosing lines that appeared to cover the representative units of vegetation within the parcel being measured. Transects were generally run toward the center of the parcels in order to avoid transitional areas at parcel edges. A minimum of five transects were run on each parcel. If the vegetation cover was particularly heterogeneous, a qualitative method was employed in selecting additional transects. The transect data were checked visually and additional transects were run to lessen the degree of variability as necessary.

The Green Book directs that future transects should be performed in a similar manner as the initial inventory to determine whether vegetation has changed, but allows the technique to be modified by the Technical Group to permit statistical comparison by randomly selected transects. The procedures for modifying the Green Book procedures are included under Water Agreement Section XXV. In any case, the Green Book requires the Technical Group to perform a statistical analysis in order to determine the statistical significance of any suspected vegetation changes from the 1984-87 inventory maps.

In 2004, LADWP began running transects annually within parcels located both inside and outside well fields. Some parcels are evaluated annually, while others are not. Percent total cover is calculated and compared to data collected within parcels during the period of baseline inventory.

Figure 3.12 includes vegetation transect data collected by LADWP and presented in a series of graphs documenting Owens Valley vegetation conditions. LADWP monitors vegetation using established vegetation transects that enable the Technical Group to reliably assess annual changes in vegetation cover and composition.

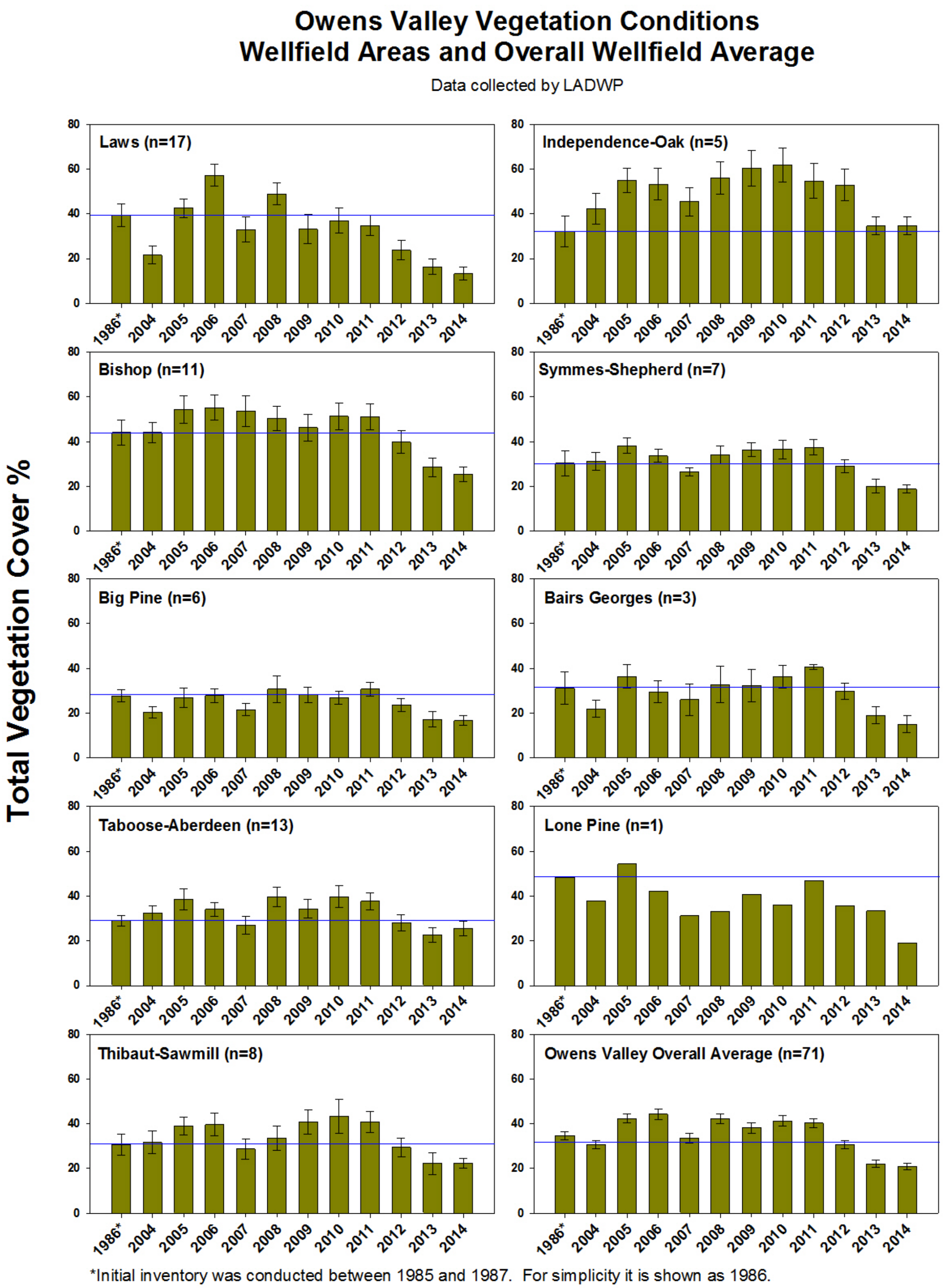

Figure 3. 12 – Owens Valley Vegetation Condition Wellfield

3.6. Bishop Cone Audit

LADWP's groundwater pumping on the Bishop Cone is governed by the provisions of the Stipulation and Order filed on August 26, 1940, in Inyo County Superior Court in the case of Hillside Water Company, a corporation et al. vs. the City of Los Angeles, a Municipal Corporation et al., (Hillside Decree) as well as the Water Agreement. Annual groundwater extractions from the Bishop Cone are limited to an amount not greater than the total amount of water used on City of Los Angeles (City) lands on the Bishop Cone during that year. Annual groundwater extractions by LADWP on the Bishop Cone are the sum of all groundwater pumped plus the amount of artesian water that has flowed from wells on the Bishop Cone during the year. Water used on City lands on the Bishop Cone are the quantity of water supplied to such lands, including conveyance losses, less any return flow to the aqueduct system.

The Inyo County Water Department (ICWD) performs an annual audit of LADWP water uses and groundwater extractions by LADWP on the Bishop Cone. The Appendices contain a draft copy of the most recent audit dated January 6, 2015. As shown in Figure 2.5, LADWP has historically pumped much less than allowed under the terms of the Hillside Decree. In the 2014-15 runoff year LADWP pumped about 10,400 acre-feet of water from the Bishop Cone area, less than half of that identified as being allowed using the current audit procedures.

The current Bishop Cone audits do not provide an accurate accounting of ditch losses and stockwater uses on the Bishop Cone and existing audit protocols should be revised to better reflect a true accounting of water supplied.

3.7. Reinhackle Spring Monitoring

As required by the 1991 EIR, Owens Valley groundwater pumping is managed to avoid reductions in spring flows that would cause significant decreases or changes in spring-associated vegetation. Groundwater pumping from wells that may affect flow from Reinhackle Spring are managed so that flows from the spring are not significantly reduced compared to flows under prevailing natural conditions. Table 3.7 shows daily flow values for Reinhackle Spring. Over the 2014-15 runoff year, Reinhackle Spring had an average daily flow of about 1.15 cfs.

Analysis of Reinhackle Spring was included in a 2004 cooperative study by LADWP and ICWD on the Owens Valley groundwater geochemistry. During the study, water samples from Reinhackle Spring were chemically analyzed and compared to water samples from the LAA, nearby pumping wells, samples from the deep aquifer, and samples from shallow monitoring wells. The 2004 study concluded that the water flowing from Reinhackle Spring is similar in composition to aqueduct water and not similar to the deep aquifer samples or up-gradient shallow aquifer wells. Testing to determine the effects of groundwater pumping and LAA seepage on Reinhackle Spring flow was conducted between May 2010 and April 2011. Data and analysis from the 2004 cooperative study and 2010-11 testing have been included in a draft monitoring and operations plan for the Bairs-Georges Wellfield known as the draft Reinhackle Spring Flow Characterization Report and Operations Plan. The draft Reinhackle Spring

Flow Characterization Report and Operations Plan was sent to the Inyo County Water Department for review in November 2012.

Table 3. 7 Reinhackle Spring Flow in cfs During 2014-15 Runoff Year

Day of Month	April	May	June	July	August	September	October	November	December	January	February	March	Annual
1	1.19	1.19	1.15	1.24	1.27	1.27	1.27	1.19	1.03	1.03	1.11	0.98	
2	1.19	1.19	1.15	1.25	1.27	1.26	1.27	1.19	1.03	1.03	1.11	0.99	
3	1.19	1.19	1.15	1.25	1.28	1.27	1.27	1.19	1.03	1.03	1.11	0.99	
4	1.19	1.19	1.13	1.23	1.27	1.27	1.27	1.19	1.03	1.03	1.11	0.99	
5	1.19	1.19	1.11	1.23	1.27	1.27	1.27	1.19	1.03	1.03	1.11	0.99	
6	1.19	1.19	1.11	1.24	1.25	1.27	1.27	1.17	1.03	1.03	1.09	0.99	
7	1.19	1.19	1.11	1.25	1.24	1.27	1.25	1.15	1.03	1.03	1.07	0.99	
8	1.19	1.19	1.14	1.23	1.25	1.27	1.24	1.15	1.03	1.03	1.07	0.99	
9	1.19	1.19	1.15	1.19	1.25	1.27	1.24	1.15	1.03	1.03	1.06	0.99	
10	1.19	1.19	1.15	1.19	1.27	1.31	1.23	1.15	1.03	1.03	1.03	1.02	
11	1.19	1.19	1.17	1.19	1.27	1.31	1.27	1.15	1.03	1.03	0.99	1.03	
12	1.19	1.19	1.19	1.19	1.27	1.31	1.27	1.15	1.04	1.03	0.95	1.03	
13	1.19	1.19	1.19	1.19	1.27	1.31	1.25	1.09	1.07	1.03	0.95	1.01	
14	1.19	1.19	1.19	1.19	1.27	1.31	1.25	0.99	1.07	1.03	0.95	0.99	
15	1.19	1.19	1.19	1.19	1.25	1.31	1.23	0.99	1.07	1.03	0.95	0.99	
16	1.19	1.19	1.19	1.19	1.19	1.32	1.23	0.99	1.07	1.03	0.95	0.99	
17	1.19	1.19	1.19	1.19	1.19	1.31	1.23	0.99	1.07	1.03	0.95	0.99	
18	1.19	1.18	1.19	1.19	1.19	1.31	1.23	0.99	1.07	1.03	0.95	0.99	
19	1.19	1.19	1.19	1.22	1.22	1.31	1.19	0.99	1.07	1.03	0.95	0.99	
20	1.19	1.19	1.19	1.23	1.23	1.31	1.19	0.99	1.07	1.07	0.95	0.99	
21	1.19	1.19	1.19	1.23	1.23	1.31	1.19	0.99	1.07	1.07	0.96	0.99	
22	1.19	1.19	1.20	1.23	1.23	1.31	1.19	0.99	1.07	1.07	0.96	0.99	
23	1.19	1.18	1.21	1.23	1.23	1.31	1.19	1.02	1.07	1.07	0.99	1.00	
24	1.19	1.16	1.22	1.23	1.23	1.31	1.19	1.03	1.07	1.07	0.99	1.01	
25	1.19	1.15	1.23	1.23	1.23	1.31	1.19	1.03	1.07	1.09	0.99	1.02	
26	1.19	1.15	1.23	1.23	1.25	1.31	1.19	1.03	1.07	1.11	0.98	1.03	
27	1.19	1.15	1.23	1.23	1.27	1.31	1.19	1.03	1.06	1.11	0.95	1.03	
28	1.19	1.15	1.23	1.26	1.26	1.31	1.19	1.03	1.06	1.11	1.05	1.03	
29	1.19	1.15	1.25	1.27	1.27	1.31	1.19	1.03	1.03	1.11		1.03	
30	1.29	1.15	1.08	1.27	1.27	1.17	1.19	1.08	1.03	1.11		1.03	
31		2.04		1.96			2.00		1.62	1.50		1.03	
Average	1.19	1.21	1.18	1.25	1.25	1.29	1.25	1.08	1.07	1.07	1.01	1.00	1.15

3.8. Water Spreading in the Owens Valley

The April 1, 2014, Eastern Sierra overall snowpack was estimated to be 30% of normal and Owens Valley runoff was about 52% of normal during the 2014-15 runoff year. In years with much greater than normal snowmelt, the volume of runoff may at times exceed the capacity of the LAA system. During periods of high snowpack runoff, LADWP may spread runoff water for operational reasons. No water was spread from water spreading diversions during the 2014-15 runoff year.

Overall estimated snowpack as of April 1, 2015, is about 4% of normal and forecast runoff in the Owens River Basin is about 148,600 acre-feet or 36% of average. Water spreading is not anticipated during the 2015-16 runoff year; however, based upon the prevailing temperature, precipitation, and available LAA capacity in the upcoming year, some limited water spreading may occur for operational reasons.

3.9. Owens Lake Dust Mitigation

In accordance with the Great Basin Unified Air Pollution Control District's (GBUAPCD) *2003 and 2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plans*, LADWP has mitigated dust emissions from just over 42 square miles of the Owens Lakebed to date. A total of 53,700 acre-feet of water was released for dust control on Owens Lake during the 2014-15 runoff year.

Shallow flooding, managed vegetation, and gravel cover dust control measures have been used to mitigate dust emissions from the lakebed and are recognized as the approved Best Available Control Measures by GBUAPCD.

Currently, Phase 7a of the Owens Lake Dust Control Project is under construction, which would bring an additional 3.1 square miles of new dust control into operation in areas formerly designated for Moat and Row under Phase 7. In addition, Phase 7a is converting 3.4 square miles currently operated as shallow flooding to managed vegetation, gravel cover, or a hybrid of the approved control measures to use water more efficiently and to maintain/enhance wildlife habitat value on Owens Lakebed.

Furthermore, LADWP is anticipating receiving an order from the GBUAPCD within the next few months to mitigate dust emissions from up to 300 acres on Owens Lake playa as part of the Owens Lake Dust Mitigation Program - Phase 7b Project.

LADWP has prepared a Draft Environmental Impact Report (DEIR) for implementation of the GBUAPCD's 2011 and 2012 Supplemental Control Requirements Determinations (also known as Owens Lake Dust Mitigation Program – Phase 9/10 Project) which requires mitigating dust emissions from an additional 3.61 square miles of Owens Lakebed. The public comment period for the DEIR began on February 12, 2015 and ended on March 30, 2015. LADWP anticipates that the final Environmental Impact Report for these dust mitigation activities will be adopted and certified on or about July 1, 2015. LADWP is required to complete the implementation of the Owens Lake Dust Mitigation Program – Phase 9/10 Project by December 31, 2017.

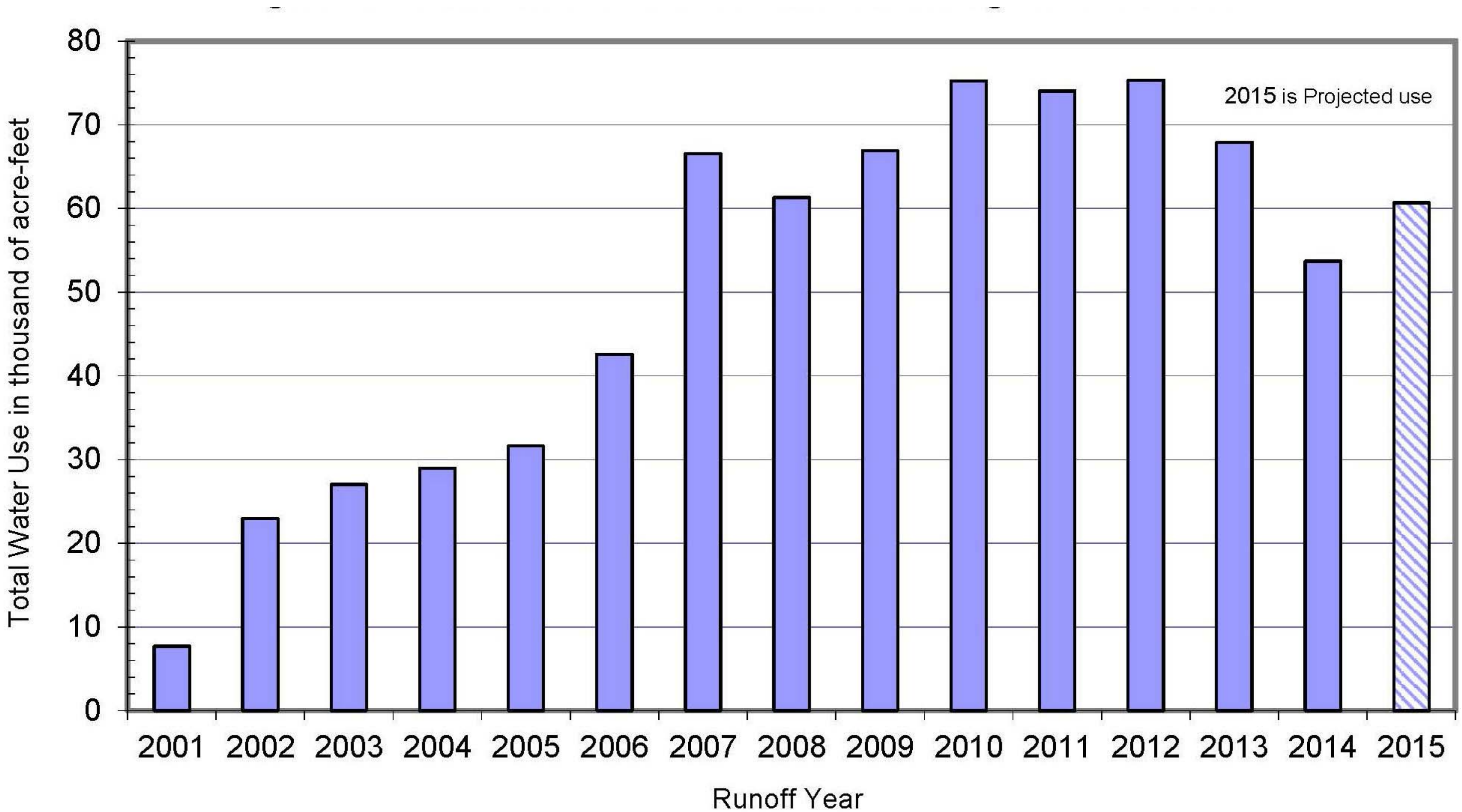

Figure 3. 13 Water Use by Owens Lake Dust Mitigation Activities

4. ENHANCEMENT/MITIGATION PROJECT STATUS

4. ENHANCEMENT/MITIGATION (E/M) PROJECT STATUS

Table 4.1 provides the current status of Owens Valley Enhancement/Mitigation Projects.

TABLE 4.1 E/M Project Status

ENHANCEMENT/MITIGATION PROJECT STATUS			
1991 EIR Source	**PROVISION**	**PROGRESS TO DATE**	**STATUS**
E/M Projects (EIR Table 5-3), 1985-1990	Big Pine Northeast Regreening (30 acres)	This project was implemented to enhance the aesthetics of abandoned agricultural or pasture lands in areas around the towns of Big Pine, Independence, and Lone Pine. Water is supplied from LADWP facilities to promote and maintain vegetation. The Technical Group exempted Well W375 on November 6, 2013, for project make-up water in order to make this project feasible. Installation of the irrigation system for this project occurred in the Winter of 2013-2014. As of April 2014, implementation of this project by LADWP is complete. The project is implemented and ongoing.	Implemented and ongoing.
E/M Projects (EIR Table 5-3), 1985-1990	Eastern California Museum	This project enhanced the appearance of the Eastern California Museum grounds in Independence. It consists of a small pond, trees, expanded lawn areas, and of an irrigation system.	Implemented and ongoing.
E/M Projects, imp./committed 1970-1990 (EIR Table 4-3)	Independence Ditch System	Implemented in 1987.	Implemented and ongoing.
E/M Projects, 1985-1990 (EIR Table 5-3), Impact 10-11	Independence East Side Regreening Project (23 acres)	This project was implemented to enhance the aesthetics of abandoned agricultural or pasture lands in areas around the towns of Big Pine, Independence, and Lone Pine. Water is supplied from LADWP facilities to promote and maintain vegetation. The well for this project was drilled in September 2012. Construction of the irrigation system for this project occurred during the Winter of 2013-2014. As of April 2014, implementation of this project by LADWP is complete and ongoing.	Implemented and ongoing.

1991 EIR Source	PROVISION	PROGRESS TO DATE	STATUS
E/M Projects, 1985-1990 (EIR Table 5-3), Impact 10-16	Independence Pasture Lands and Native Pasture Lands (610 acres)	This project revegetated approximately 910 acres of abandoned croplands and sparsely vegetated land to create native pasture lands and provides water to native vegetation lands (including Independence Springfield, ~300 acres, below). This involved the conversion of sparsely vegetated land east of Independence to productive native pasture land by flood irrigation. The project mitigated a source of blowing dust and stabilized soil previously affected by severe wind erosion. Currently, approximately 520 acres are incorporated into the project. The project was evaluated in 2008 to determine if additional acreage should be irrigated. Figure 12-2 of 1991 EIR for the project (1991 EIR) was scanned and rubber sheeted onto a quad sheet for acreage calculations in GIS. The Independence pasturelands acreage in this image was actually 522 acres. Therefore, LADWP has implemented the acreage designated in the figure presented in the 1991 EIR.	Implemented and ongoing.
E/M Projects (EIR Table 5-3), 1985-1990	Independence Roadside Rest Area (0.5 acres)	This project consisted of planting shade and windbreak trees and grass, installation of an irrigation system, and placement of a picnic table on a ½-acre site south of the town of Independence.	Implemented and ongoing.
E/M Projects, 1985-1990 (EIR Table 5-3), Impact 10-11	Independence Springfield (286 acres)	This project revegetated approximately 910 acres of abandoned croplands and sparsely vegetated land to create native pasture lands and provides water to native vegetation lands (including Independence Pasturelands, 610 acres, above). This involved the conversion of sparsely vegetated land east of Independence to productive native pasture land by flood irrigation. The project mitigated a source of blowing dust and stabilized soil previously affected by severe wind erosion. The Independence Springfield has achieved its goal by irrigating over 280 acres. The E/M Project is currently under evaluation by the Technical Group.	Implemented and ongoing.
E/M Projects, imp./committed 1970-1990 (EIR Table 4-3), Impact 10-11	Independence Woodlot (20 acres)	The Independence Woodlot has achieved its goals. California Department of Forestry assists with harvesting and cleanup. The Lone Pine Future Farmers of America (FFA) irrigates the woodlot and distributes the wood according to the operations plan and management guidelines that were developed by the Technical Group. Maintenance of the woodlot is ongoing.	Implemented and ongoing.

1991 EIR Source	PROVISION	PROGRESS TO DATE	STATUS
E/M Projects, 1985-1990 (EIR Table 5-3), Impact 11-1	Klondike Lake Aquatic Habitat (160 acres)	The Klondike Lake Project sustains a year round water supply in this 160-acre formerly seasonal lakebed area providing nesting and feeding areas for waterfowl, and permitting water skiing and other water sports in summer months. The estimated water usage for the project was reduced from 2,200 AF to 1,700 AF, with 1,500 AF allocated for conveyance and lake level maintenance and up to 200 AF allocated for the Klondike Southshore Habitat Area (SSHA) south of the lake. A new diversion was installed and implementation of the releases for waterfowl habitat south of the lake began in May 2005. Delivery of the total allocation of up to 200 AF to the south was initially problematic because of the low hydraulic gradient between the lake and the waterfowl habitat areas. The low hydraulic gradient also made accurate flow measurement difficult. Sand accumulations have periodically been cleared from the conveyance pipe inlet and vegetation removed from the pipe outflow area to facilitate flow. A different water release location was utilized starting in 2012. In 2014, 52 AF was supplied to the waterfowl area due to extreme drought conditions. However, although the volume was less than past years, shallow flooding of waterfowl habitat was maintained throughout the May-September flooding period. Implemented and ongoing.	Implemented and ongoing.
E/M Projects, 1985-1990, Impact 10-18	Laws Historical Museum Pasturelands (21+15 acres)	This project provides a regular water supply to improve the native vegetation on a 21-acre parcel, establish irrigated pasture on 15 acres and establish windbreak trees, all adjacent to the museum. Implemented and ongoing.	Implemented and ongoing.
E/M Projects, 1985-1990 (EIR Table 5-3), Impact 10-18	Laws/Poleta Native Pasture (216 acres)	This project provides water for irrigation of 220 acres of sparsely vegetated land to reestablish native vegetation on abandoned pasture lands and increase livestock grazing capabilities. Implemented and ongoing.	Implemented and ongoing.

1991 EIR Source	PROVISION	PROGRESS TO DATE	STATUS
E/M Projects, 1985-1990 (EIR Table 5-3), Impact 10-16	Lone Pine East Side Regreening (11 acres)	This project was implemented to enhance the aesthetics of abandoned agricultural or pasture lands in areas around the towns of Big Pine, Independence, and Lone Pine. Water is supplied from LADWP facilities to promote and maintain vegetation. Implemented and ongoing.	Implemented and ongoing.
E/M Projects (EIR Table 5-3), 1985-1990	Lone Pine Riparian Park (320 acres)	This project has reestablished abandoned pastureland and provides water to approximately 320 acres of native vegetation lands and increases livestock grazing capabilities.	Implemented and ongoing.
E/M Projects (EIR Table 5-3), 1985-1990	Lone Pine Sports Complex	This project converted vacant City property to an outdoor sports complex consisting of baseball fields, soccer fields, parking, picnic, and park areas.	Complete.
E/M Projects, 1985-1990 (EIR Table 5-3), Impact 10-16	Lone Pine West Side Regreening (8 acres)	This project was implemented to enhance the aesthetics of abandoned agricultural or pasture lands in areas around the towns of Big Pine, Independence, and Lone Pine. Water is supplied from LADWP facilities to promote and maintain vegetation. Implemented and ongoing.	Implemented and ongoing.
E/M Projects, imp./committed 1970-1990 (EIR Table 4-3), Impact 10-16	Lone Pine Woodlot (12 acres)	The Lone Pine Woodlot has achieved its goals. The California Department of Forestry helps with harvesting and cleanup and the Lone Pine Future Farmers of America (FFA) irrigates the woodlot and distributes the wood according to the operations plan and management guidelines that were developed by the Technical Group. Maintenance of the wood Lot is ongoing. Implemented and ongoing.	Implemented and ongoing.

1991 EIR Source	PROVISION	PROGRESS TO DATE	STATUS
E/M Projects, 1985-1990 (EIR Table 5-3), Impact 10-14	Lower Owens River Rewatering Project (18,000 AFY)	This project was to provide a continuous flow of water in a 50-mile, previously dry (1913-1986) portion of the river channel creating a warm water fishery and wildlife habitat in the southern Owens Valley. The project also supplies water to five small lakes along the river route providing improved waterfowl habitat in the region. The new fishery supports such warm water species as largemouth bass; and the project's lakes provide breeding and feeding grounds for waterfowl and shorebirds. Inyo County and LADWP decided to reduce the water supply to the Lower Owens River Project in 1991 because of a lack of E/M well supply. The portion of the river between Blackrock Spill gate and Independence was dry until the Lower Owens River Project was implemented in December 2006. For more information on the LORP, please reference LADWP's LORP Annual Report.	Implemented and ongoing.
--	Manzanar Tree Pruning		Complete.
E/M Projects, 1985-1990 (EIR Table 5-3), Impact 10-18	McNally Ponds and Native Pasturelands (360 acres)	This project provides water for 300 acres during the spring and summer months to mitigate and sustain vegetation, and to provide water to 60 acres of ponds during the fall months for waterfowl habitat. The Standing Committee agreed in 1991 to reduce the water commitment to the McNally Ponds Project for that year because of dry conditions. In many normal and below normal runoff years since that time, the Standing Committee has reduced water releases to this project. In years of abundant runoff the project receives its full allotment of water. In 2012-13 the Standing Committee agreed to not provide a full allotment of water to the project. Under the current operating procedures, in years when the McNally Canals are operating or the McNally Ponds supply wells are in ON status, the ponds receive a full water allotment. The E/M projects are currently under evaluation by the Technical Group.	Implemented and ongoing.

1991 EIR Source	PROVISION	PROGRESS TO DATE	STATUS
E/M Projects, 1985-1990 (EIR Table 5-3)	Millpond Recreation Area (18 acres irrigated pond)	Since 1985, funds have been provided to purchase energy to operate the recreation area's sprinkler system that water's 18 acres of the community park including two softball fields. Implemented and ongoing.	Implemented and ongoing.
E/M Projects, imp./committed 1970-1990 (EIR Table 4-3)	North Lone Pine Cleanup	Implemented in 1989. Complete.	Complete.
E/M Projects, imp./committed 1970-1990 (EIR Table 4-3), Impact 10-16	Richards Fields (160 acres)	The goals for this project are being met. Implemented and ongoing.	Implemented and ongoing.
E/M Projects, 1985-1990 (EIR Table 5-3), Impact 10-11	Shepherd Creek Alfalfa Field (198 acres)	This 198-acre area was abandoned cropland that had sparse vegetation and was a source of blowing dust. It has since been revegetated with alfalfa that is sprinkler irrigated and wind break trees. The Shepherd Creek Alfalfa Field Project is 100% complete and has achieved its goals.	Implemented and ongoing.
Impact 10-11	Shepherd Creek Potential (60 acres)	The Shepherd Creek Potential Project was evaluated and natural increases in the density of native cover have occurred that are comparable to baseline conditions in adjacent undisturbed parcels. Therefore, the goals for this potential project, as stated in the EIR, have been met.	Complete.
E/M Projects, imp./committed 1970-1990 (EIR Table 4-3)	Tree Planting Along Public Roads	Implemented in 1988. Planting complete. Irrigation ongoing.	Implemented and ongoing.

1991 EIR Source	PROVISION	PROGRESS TO DATE	STATUS
E/M Projects, imp./committed 1970-1990 (EIR Table 4-3), Impact 10-16	Van Norman Fields (170 acres)	A portion of the project could not be irrigated because of topography. This area was evaluated jointly by LADWP and Inyo County; a decision was made that this high area could not be modified to increase irrigation efficiency and that the project goals were being fulfilled. Additionally the project supply well designated for this project, Well 390, has reached the end of its service life and replacement well W425 was drilled in October 2012. The project was modified by the Standing Committee April 22, 2014 to include 10 acres for the Lone Pine High School Farm. The agreed upon water allotment for the modified project is approximately 2.8 AF/acre. Water is currently being supplied to the project during irrigation season.	Implemented and ongoing.

5. 1991 OWENS VALLEY ENVIRONMENTAL IMPACT REPORT (1991 EIR) MITIGATION MEASURE STATUS

5. 1991 OWENS VALLEY ENVIRONMENTAL IMPACT REPORT (1991 EIR) MITIGATION MEASURE STATUS

This section contains a progress and status update on the LADWP's mitigation measures from the 1991 EIR (Table 5.1). Table 5.2 also provides a status update on specific projects identified in the 1999 *Revegetation Plan for Impacts Identified in the LADWP, Inyo County EIR for Groundwater Management* (Revegetation Plan or Mitigation Plan). Also in this section is the 2015 Revegetation Plan for Hines Spring South that has recently been implemented.

5.1 1991 Owens Valley Environmental Impact Report (1991 EIR) Mitigation Measure Status

TABLE 5.1 1991 EIR Mitigation Measures

REVEGETATION/REGREENING COMMITMENTS (1999 REVEGETATION PLAN/MITIGATION PLAN)			
TITLE	**PROVISON**	**PROGRESS TO DATE**	**STATUS**
Abandoned Agriculture (ABAG)			
LAWS 118 (139 acres under Revegetation Plan)	Native revegetation of 139 acres of abandoned agricultural land under 1999 revegetation plan (separate than Type E transfer).	Site was fenced to reduce disturbance. Dryland revegetation studies examining various planting and watering techniques were conducted in a portion of LAWS 118 by SAIC and MWH Americas. Permanent transects have been established. Approximately 18 acres were seeded with locally collected seeds in the spring of 2011. As of August 2012, the parcel has achieved 2% native cover (10% cover goal, 8 perennial species). In January of 2013, a new fence was installed between the western portion of LAWS 118 and the Cashbaugh Lease. Planting at this parcel will begin upon the completion of planting for Type E Transfer obligations due to 2013 deadline.	Active revegetation efforts undertaken, but has not yet achieved success criteria.
Bishop 97 (Beacon Curve- 124 acres abandoned agricultural)	Native revegetation of 124 acres of abandoned agricultural land south of Bishop.	Site was fenced to reduce disturbance. Permanent transects were established in this parcel. MWH Americas, Inc. conducted studies on dryland revegetation techniques using native seed and various treatments in 2003/2004. In spring 2011, 35 acres were drill seeded with locally collected seeds and a buried drip system was installed on 16 acres in this area. As of 2012, the parcel has achieved 4.8% native perennial cover (13.5% cover goal, 9 perennial species). Planting at this parcel will begin upon the completion of planting for Type E Transfer obligations due to 2013 deadline. Recruitment of native species is naturally occurring at this parcel.	Active revegetation efforts undertaken, but has not yet achieved success criteria.

Abandoned Agriculture (ABAG)			
Big Pine 160	Native revegetation of 209 acres of abandoned agricultural land east of Big Pine.	Site was fenced to reduce disturbance. Permanent vegetation transects have been established in this parcel. In spring 2011, 20 acres were drill seeded with locally collected seed. As of 2012, the parcel contained 3% native perennial vegetation (16% goal, 9 perennial species). In February 2014, LADWP crews seeded approximately 28 acres of this parcel with a native seed mix. The seeding was scheduled with a storm event and the areas seeded received around 1.35 inches of rain during and directly after seeding. Potential water sources are being evaluated for this site. A drip irrigation system is currently being designed for a portion of this site. LADWP anticipates irrigation design will be complete by the end of 2015 and implementation beginning in Spring 2016. Some natural recruitment is occurring along the perimeter of the site.	Active revegetation efforts undertaken, but has not yet achieved success criteria.

Groundwater Pumping			
Five Bridges	Native revegetation of ~60 acres impacted by groundwater pumping (north of Bishop)	Permanent photo points and vegetation transects have been established and are monitored annually. Water is released to the mitigation area three times a year within the growing season. The Mitigation Plan stated that releases should be conducted by high flows in the Owens River. These high flows are no longer available on a regular basis with reductions in Mono Basin water to the Owens River system. Consequently, LADWP conducts the three required flows by releasing water through the Bishop Creek Canal into the west side of the project area. Weed control is conducted annually, but pepperweed invasion continues to be a persistent problem. Controlled burns have also been conducted to help with weed control. Success criteria for vegetation is 60% cover with 4 perennial species in Alkali meadow; and 90% cover with 4 perennial species in riparian scrub. At transect L4 in 2014, perennial cover was 8.7%, composed of five native species. Perennial cover at transect L5 in 2015 was 34.1%, composed of six native species. Both of these transects are located in Alkali meadow areas. Vegetation cover has declined in recent years due to successive dry years, pepperweed invasion, and subsequent weed treatment.	Implemented and ongoing.

Groundwater Pumping			
Hines Springs	A total of 1600 AF of water per year will be supplied by LADWP for the implementation of the on-site mitigation measure at Hines Springs and on-site or off-site mitigation identified in the 1991 EIR for impacts at Fish Springs, Big and Little Seely Springs and Big and Little Blackrock Springs. Under the direction of LADWP and the County, Ecosystem Sciences will recommend reasonable and feasible on-site and/or off-site mitigation measures, including the implementation of mitigation at Hines Springs. Projects recommended by these studies and evaluations will be presented to the Board of Water and Power Commissioners for approval and implementation. The mitigation measures are to be implemented by LADWP and maintained by LADWP and/or the County. The measures were to be implemented within 36 months of the discharge of the writ.	The Second Amendment of Amended Stipulation and Order (Case No. S1CVCV01- 29768) regarding the Additional Mitigation Projects Developed by the MOU Ad Hoc Group was executed on March 8, 2010 by Inyo County Superior Court. This Amendment accepts the Additional Mitigation Projects as mitigation for the 1600 AF provision and establishes a two-year timeline for implementation of the projects. The Additional Mitigation Projects were approved by the Board of Water and Power Commissioners following CEQA evaluation in June 2010. LADWP began implementing the eight projects shortly thereafter and all projects were implemented by the March 8, 2012 court deadline.	Implemented and ongoing. Monitoring is ongoing.

Groundwater Pumping			
Tinemaha 54 (Charlie's Butte)	Native revegetation of a 0.4-acre parcel near Charlie's Butte.	Site was fenced to reduce disturbance. Permanent vegetation transects have been established in this parcel. Grass plants were planted in 1999 and a drip irrigation system installed in 2001. Plants were irrigated through 2004 to encourage grass establishment. As of 2012, the parcel has achieved 2.1% total perennial cover (29.7% cover goal, 2 perennial species).	Active revegetation efforts undertaken, but has not yet achieved success criteria.
Hines Springs S	Native revegetation of old Hines Spring Drainage (BLK011 and 016).	The Revegetation Plan for Hines Spring S is complete and provided in this section. Construction of fencing per the plan is complete. Monitoring will be ongoing through 2019, at which time the plan will be reevaluated if success criteria is not yet met.	Active revegetation efforts undertaken, but has not yet achieved success criteria.
Blackrock 16E	Native revegetation of 7.5 acres of Alkali meadow east of Aberdeen	Site was fenced to reduce disturbance. Permanent vegetation transects have been established. As of 2010, site has attained the goals for cover and composition (30.6% cover and 5 perennial species). Fencing has been removed.	Complete.

Groundwater Pumping			
Independence 105	Native revegetation of 13.4 acres of lands impacted by groundwater pumping.	Site was fenced to reduce disturbance. Permanent vegetation transects have been established. As of 2006, site has attained the goals for cover and composition (15.3% cover and 3 perennial species).	Complete.
Independence 131	Native revegetation of 74.6 acres of lands impacted by groundwater pumping.	Site was fenced to reduce disturbance. Permanent vegetation transects have been established. SAIC and MWH conducted dryland revegetation studies using various irrigation methods and planting techniques. 25 acres were drill seeded with locally collected seeds in the spring of 2011. As of 2012, IND131N has achieved the revegetation goals with 15.7% live cover composed of five perennial species. As of 2012, IND131S contains 6.2% perennial cover (Goal is 15.3% cover, 3 perennial species), so it has not yet met the site specific goal.	IND131N complete. IND131S- Active revegetation efforts undertaken, but has not yet achieved success criteria.
Independence 123	Native revegetation of 28.5 acres of lands impacted by groundwater pumping.	Site was fenced to reduce disturbance. Permanent vegetation transects have been established. As of 2006, site has attained the goals for cover and composition (15.3% cover and 3 perennial species).	Complete.

Enhancement Mitigation Sites			
Big Pine NE Regreening	Approximately 30 acres of irrigated pasture.	Mitigation Plans for the project were transmitted to the County in 2004. Comments were received from the County in 2005. LADWP identified issues making the project unfeasible as originally scoped. In order to facilitate implementation of the project LADWP recommended the following changes: (1) change the water source for the project to include the Big Pine Canal (Well W375 remained scoped as project make-up water well), (2) change irrigation method from flood irrigation to the option of flood or sprinkler irrigation, (3) move the project area closer to Highway 395, and (4) change the lessee identified for the project to an unspecified lessee. These changes were discussed publicly at the September 9, 2009, Inyo County Water Commission meeting and the November 5, 2009, Standing Committee meeting. At the November 4, 2010 Standing Committee meeting, modifications to the Final Scoping Document were approved. Key modifications include: changing the lessee designation, revising the boundaries of the project, and amending the water supply source and method of application identified for the project. The ICWD and Technical Group analyzed the operation of Well W375 and concluded that an exemption for up to 150 AF per year would likely have no significant impact on the environment or other well owners.	

Enhancement Mitigation Sites			
Big Pine NE Regreening (cont.)		LADWP circulated a Negative Declaration (ND) for the project August 3-September 1, 2011. New information was provided and the ND was recirculated November 10-December 12, 2011. A ND was filed with Inyo County on March 7, 2012. The adequacy of the ND was legally challenged by the Big Pine Paiute Tribe and Sierra Club in Inyo County Superior Court Case SICVPT12-53541 based on the fair argument standard that substantial evidence supports the issuance of an Environmental Impact Report (EIR) rather than a ND. A decision was issued by Inyo County Superior Court November 26, 2012, denying the parties' Petition for Writ of Mandate and in favor of issuing the LADWP's ND rather than an EIR. The Technical Group exempted Well W375 on November 6, 2013, for project make-up water in order to make this project feasible. Installation of the irrigation system for this project occurred in the Winter of 2013-2014. As of April 2014, implementation of this project by LADWP was complete. Implemented and ongoing.	Implemented and ongoing.
East Big Pine	Native revegetation of approximately 20 acres directly to the east of Big Pine (west of Big Pine 160)	Site was fenced to reduce disturbance and promote reestablishment in 2007. In February 2014, LADWP crews seeded approximately 3.2 acres of this area with a native seed mix in conjunction with the adjacent BGP160 parcel. The seeding was scheduled with a storm event and the areas seeded received around 1.35 inches of rain during and directly after seeding.	Active revegetation efforts undertaken

Enhancement Mitigation Sites			
Independence East Side Regreening	Approximately 30 acres irrigated pasture.	Mitigation plans were submitted to Inyo County Water Department (ICWD) for this project on August 13, 2004. LADWP circulated a Mitigated Negative Declaration (MND) for the Independence Eastside Regreening Project and Town Water System September 23-October 29, 2004. The Board of Water and Power Commission approved the project in May 2005. Following approval, Inyo County requested that three minor modifications to the project be made: (1) the project well to be located approximately 100 yards to the east of the originally proposed location, (2) that sprinkler irrigation be considered in place of flood irrigation, and (3) that a portion of the project area include stables and/or corrals. An amendment to the project scoping document that incorporates these changes was approved by the Standing Committee on April 23, 2009. The well for this project was drilled in September 2012. Construction of the irrigation system for this project occurred during the Winter of 2013-2014. As of April 2014, implementation of this project by LADWP was complete. Implemented and ongoing.	Implemented and ongoing.
East Shepherd Creek	Native Revegetation of 60 acres	The Shepherd Creek Potential Project was evaluated and natural increases in the density of native cover have occurred that are comparable to baseline conditions in adjacent undisturbed parcels. Therefore, the goals for this potential project, as stated in the EIR, have been met.	Complete.

5.2 Status of Revegetation/Regreening Commitments (1999 Revegtation Plan/Mitigation Plan)

TABLE 5.2 Revegetation/Regreening Commitments (1999 Revegetation Plan/Mitigation Plan)

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Bishop 97 (Beacon Curve- 124 acres ABAG)	Native revegetation of 124 acres of abandoned agricultural land south of Bishop.	Site was fenced to reduce disturbance. Permanent transects were established in this parcel. MWH Americas, Inc. conducted studies on dryland revegetation techniques using native seed and various treatments in 2003/2004. In spring 2011, 35 acres were drill seeded with locally collected seeds and a buried drip system was installed on 16 acres in this area. As of 2012, the parcel has achieved 4.8% native perennial cover (13.5% cover goal, 9 perennial species). Planting at this parcel will begin upon the completion of planting for Type E Transfer obligations due to 2013 deadline. Recruitment of native species is naturally occurring at this parcel.	Active revegetation efforts undertaken, but has not yet achieved success criteria.

Abandoned Agriculture (ABAG)			
Big Pine 160	Native revegetation of 209 acres of abandoned agriculture land east of Big Pine.	Site was fenced to reduce disturbance. Permanent vegetation transects have been established in this parcel. In spring 2011, 20 acres were drill seeded with locally collected seed. As of 2012, the parcel contained 3% native perennial vegetation (16% goal, 9 perennial species). In February 2014, LADWP crews seeded approximately 28 acres of this parcel with a native seed mix. The seeding was scheduled with a storm event and the areas seeded received around 1.35” of rain during and directly after seeding. Potential water sources are being evaluated for this site. A drip irrigation system is currently being designed for a portion of this site. LADWP anticipates irrigation design will be complete by the end of 2015 and implementation beginning in Spring 2016. Some natural recruitment is occurring along the perimeter of the site.	Active revegetation efforts undertaken, but has not yet achieved success criteria.

Groundwater Pumping			
Five Bridges	Native revegetation of ~60 acres impacted by groundwater pumping (north of Bishop)	Permanent photo points and vegetation transects have been established and are monitored annually. Water is released to the mitigation area three times a year within the growing season. The Mitigation Plan stated that releases should be conducted by high flows in the Owens River. These high flows are no longer available on a regular basis with reductions in Mono Basin water to the Owens River system. Consequently, LADWP conducts the three required flows by releasing water through the Bishop Creek Canal into the west side of the project area. Weed control is conducted annually, but Pepperweed invasion continues to be a persistent problem. Controlled burns have also been conducted to help with weed control. Success criteria for vegetation is 60% cover with 4 perennial species in Alkali meadow; and 90% cover with 4 perennial species in riparian scrub. At transect L4 in 2014, perennial cover was 8.7%, composed of five native species. Perennial cover at transect L5 in 2015 was 34.1%, composed of six native species. Both of these transects are located in Alkali meadow areas. Vegetation cover has declined in recent years due to successive dry years, Pepperweed invasion, and subsequent weed treatment.	Implemented and ongoing.

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Tinemaha 54 (Charlie's Butte)	Native revegetation of 0.4 acre parcel near Charlie's Butte.	Site was fenced to reduce disturbance. Permanent vegetation transects have been established in this parcel. Grass plants were planted in 1999; drip irrigation system installed in 2001. Plants were irrigated through 2004 to encourage grass establishment. As of 2012, the parcel has achieved 2.1% total perennial cover (29.7% cover goal, 2 perennial species).	Active revegetation efforts undertaken, but has not yet achieved success criteria.

Groundwater Pumping			
Hines Springs S	Native revegetation of in old Hines Spring Drainage (BLK011 and 016).	The Revegetation Plan for Hines Spring S is complete and provided in this section. Construction of fencing per the plan is complete. Monitoring will be ongoing through 2019, at which time the plan will be reevaluated if success criteria is not yet met.	Active revegetation efforts undertaken, but has not yet achieved success criteria.
Blackrock 16E	Native revegetation of 7.5 acres of Alkali meadow east of Aberdeen	Site was fenced to reduce disturbance. Permanent vegetation transects have been established. As of 2010, site has attained the goals for cover and composition (30.6% cover and 5 perennial species). Fencing has been removed.	Complete.
Independence 105	Native revegetation of 13.4 acres of lands impacted by groundwater pumping.	Site was fenced to reduce disturbance. Permanent vegetation transects have been established. As of 2006, site has attained the goals for cover and composition (15.3% cover and 3 perennial species).	Complete.
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Enhancement Mitigation Sites			
Big Pine NE Regreening (cont.)		LADWP circulated a Negative Declaration (ND) for the project August 3-September 1, 2011. New information was provided and the ND was recirculated November 10-December 12, 2011. A Notice of Determination was filed with Inyo County on March 7, 2012. The adequacy of the ND was legally challenged by the Big Pine Paiute Tribe and Sierra Club in Inyo County Superior Court Case SICVPT12-53541 based on the fair argument standard that substantial evidence supports the issuance of an Environmental Impact Report (EIR) rather than a ND. A decision was issued by Inyo County Superior Court November 26, 2012, denying the parties' Petition for Writ of Mandate and in favor of issuing the LADWP's ND rather than an EIR. The Technical Group exempted Well W375 on November 6, 2013, for project make-up water in order to make this project feasible. Installation of the irrigation system for this project occurred in the Winter of 2013-2014. As of April 2014, implementation of this project by LADWP was complete. Implemented and ongoing.	Implemented and ongoing.
East Big Pine	Native revegetation of approximately 20 acres directly to the east of Big Pine (west of Big Pine 160)	Site was fenced to reduce disturbance and promote reestablishment in 2007. In February 2014, LADWP crews seeded approximately 3.2 acres of this area with a native seed mix in conjunction with the adjacent BGP160 parcel. The seeding was scheduled with a storm event and the areas seeded received around 1.35" of rain during and directly after seeding.	Active revegetation efforts undertaken

Enhancement Mitigation Sites			
Independence East Side Regreening	Approximately 30 acres irrigated pasture.	Mitigation plans were submitted to Inyo County Water Department (ICWD) for this project on August 13, 2004. LADWP circulated a Mitigated Negative Declaration (MND) for the Independence Eastside Regreening Project and Town Water System September 23-October 29, 2004. The Board of Water and Power Commission approved the project in May 2005. Following approval, Inyo County requested that three minor modifications to the project be made: (1) the project well to be located approximately 100 yards to the east of the originally proposed location, (2) that sprinkler irrigation be considered in place of flood irrigation, and (3) that a portion of the project area include stables and/or corrals. An amendment to the project scoping document that incorporates these changes was approved by the Standing Committee on April 23, 2009. The well for this project was drilled in September 2012. Construction of the irrigation system for this project occurred during the Winter of 2013-2014. As of April 2014, implementation of this project by LADWP was complete. Implemented and ongoing.	Implemented and ongoing.
East Shepherd Creek	Native Revegetation of 60 acres	The Shepherd Creek Potential Project was evaluated and natural increases in the density of native cover have occurred that are comparable to baseline conditions in adjacent undisturbed parcels. Therefore, the goals for this potential project, as stated in the EIR, have been met.	Complete.

5.3 Hines Spring South Revegetation Plan (February 2015)

Introduction

The Los Angeles Department of Water and Power (LADWP) *1991 Environmental Impact Report (EIR), Water from the Owens Valley to Supply the Second Los Angeles Aqueduct* identifies vegetation and other impacts that occurred as a result of the City of Los Angeles' groundwater pumping operations and related activities. From this EIR, mitigation lands were identified for revegetation efforts in the 1999 *Revegetation Plan for Impacts Identified in the LADWP, Inyo County EIR for Groundwater Management* (ICWD) (Revegetation Plan).

The Revegetation Plan identifies Hines Spring S as a revegetation site located in the old drainage of Hines Spring in vegetation parcels BLK011 and BLK016 (Figure 6 from the Revegetation Plan provided below). This area was identified in Impact 10-11 and Figure 10-8H (also below) in the 1991 EIR for impacts to groundwater dependent vegetation. Because this area could be influenced by adjacent Hines Spring on-site mitigation efforts associated with Impact 10-14 (impacts to springs and seeps), development of a revegetation plan for this area was deferred for up to three years following the implementation of that mitigation.

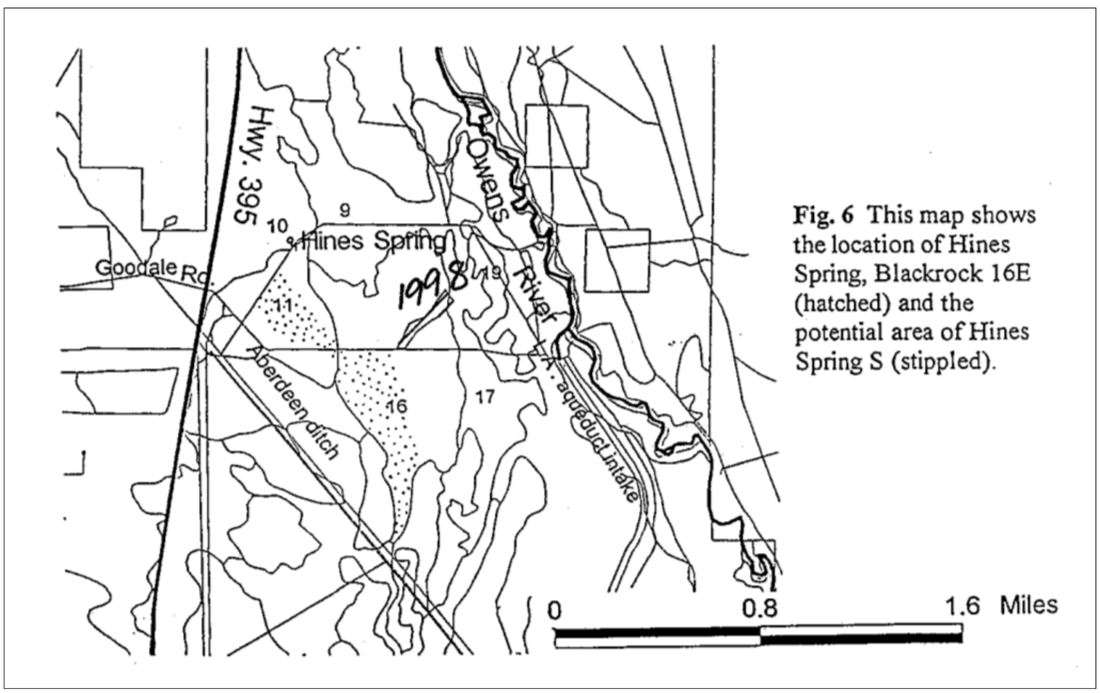


Figure 5. 1 Location of Hines Spring, Blackrock 16E (hatched) and the Potential Area of Hines Spring S (Stippled)

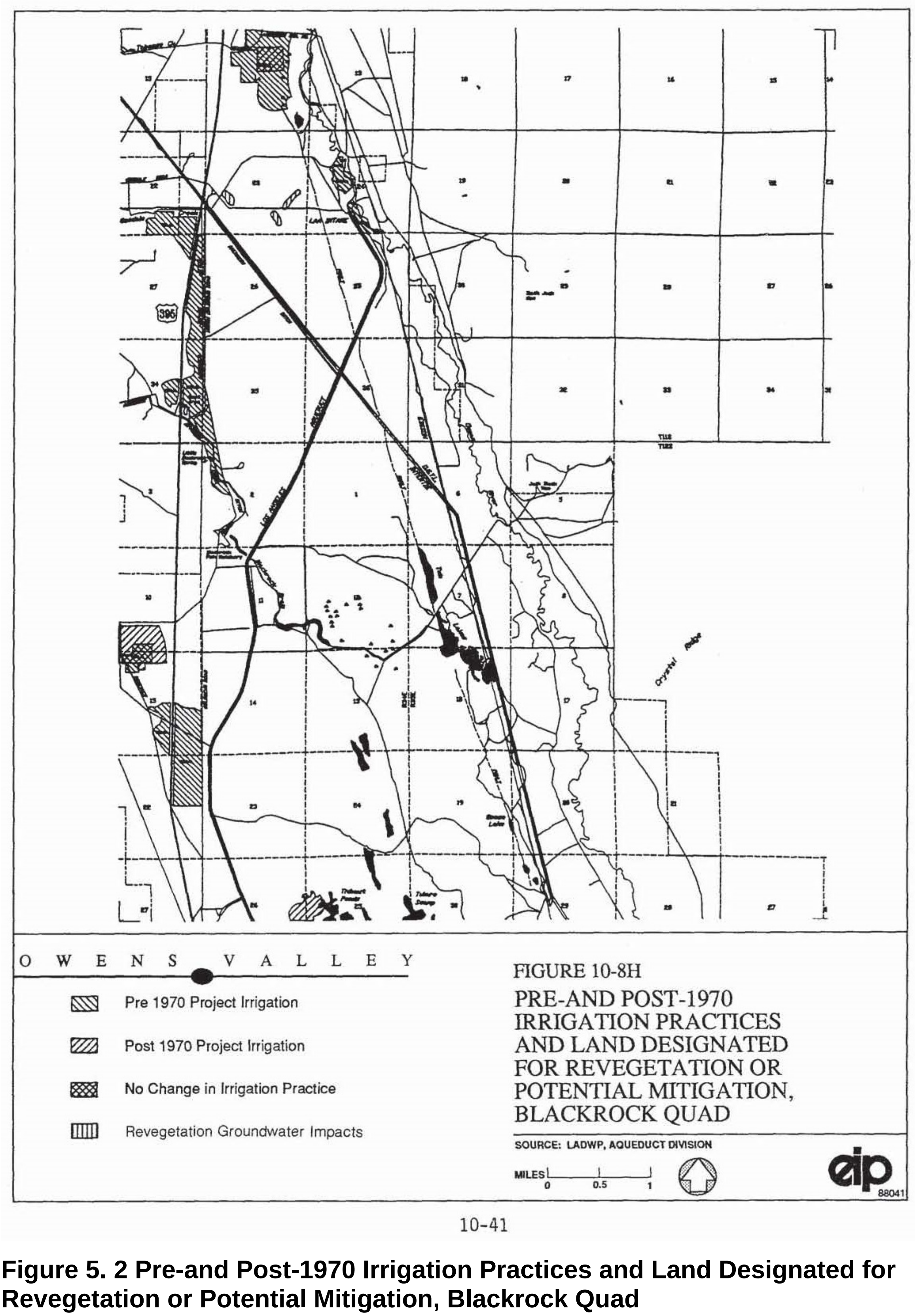


Figure 5. 2 Pre-and Post-1970 Irrigation Practices and Land Designated for Revegetation or Potential Mitigation, Blackrock Quad

The mitigation efforts at Hines Spring originated from the 1991 EIR and were further clarified as Additional Mitigation in the 1997 MOU. This "additional mitigation" evolved into a series of eight projects that collectively use 1600 acre feet of water for on and offsite mitigation. These projects are known as the Additional Mitigation Projects Developed by the MOU Ad Hoc Group and were adopted as replacement mitigation for Hines Spring in the 2010 Stipulation and Order S1CVCV01-29768. These projects were fully implemented in March 2012, and include the Hines Spring Well 355 and Aberdeen Ditch Projects that are in the immediate vicinity of the Hines Spring S revegetation site.

It is important to note that Figure 10-8H from the 1991 EIR shows the area designated for revegetation to be significantly smaller than the area designated in Figure 6 of the Revegetation Plan. The EIR calls for revegetation only in the area north of Goodale/Intake Road and in approximately, 0.2-mile drainage south of this road, versus the same northern area and a 0.9-mile drainage and wash south of the road also shown in Figure 6 of the Revegetation Plan. *Mitigation is only required in the area outlined in the legally approved EIR.* *(The 0.2 mile drainage south of Goodale/Intake Road is hereinafter referred to as the south portion of Hines Spring S Revegetation Site.)*

Current Conditions

Assessments of the current conditions of Hines Spring S were conducted in 2014 and 2015. A summary of these conditions are provided below.

Vegetation

North Portion of Hines Spring S:

Approximately one half of the north portion of Hines Spring S is naturally revegetating with native species, primarily Four wing saltbush (*Atriplex canescens),* and has cover comparable to adjacent vegetation communities. Therefore, no active revegetation efforts are necessary in this area.

The remaining half of the north portion of Hines Spring S has low cover with some Alkali sacaton (*Sporobolus airoides*) onsite, as well as dispersed mature shrub islands associated with volcanic outcrops. Despite low overall cover, there is notable diversity in this area with Alkali sacaton, Four wing saltbush (*Atriplex canescens*), big sagebrush (*Artemisa tridentata*), Rubber rabbitbrush (*Ericameria nauseosus*), and Greasewood (*Sarcobatus vermiculatus*) present. Russian thistle (*Salsola tragus*) is also present in otherwise open areas, yet its cover varies from year to year based on precipitation.

South Portion of Hines Spring S:

The south portion of Hines Spring S has naturally revegetated and has likely been positively influenced by implementation of the Aberdeen Ditch Project. The drainage has high cover (90%) of Saltgrass (*Disticlis spicata*), with additional Creeping wildrye (*Leymus triticoides*), Great Basin wildrye (*Leymus* cinereus), Coyote willow (*Salix exigua*), Wood's rose (*Rosa woodsii*), Fremont cottonwood (*Populus fremontii*), and Rubber rabbitbrush. Fourwing saltbush borders the drainage and dominates the adjacent upland communities to both sides. No active revegetation efforts are necessary in this area.

Soils

The Hines S Revegetation site is comprised of 3 different soil types:

- Cartago gravelly loamy sand, 0-2% slopes (Sandy) (north portion)
- Winnedumah silt loam, 0 to 2 percent slopes (Sodic Fan) (central; north and south portions)
- Division-Numu complex, 0 to 2 percent slopes (Saline Bottom) (south portion)

Land Management

This area is managed under grazing lease RLI-479, and is grazed by horses and mules.

Revegetation Plan

Given current conditions, active revegetation efforts are only necessary in approximately 9 acres of the north portion of Hines Spring S, shown in Figure 1.

Goal of Revegetation Efforts

Rehabilitate the site to an Alkali meadow similar to those within a 5-mile radius of the site, as in other revegetation projects in the 1999 Revegetation Plan.

Necessary Actions and Timeline

1. Fence the 9-acre portion to eliminate disturbances (designated on Figures 1 and 2) in year 1 (2015)

2. Monitor once during the growing season for five years (2015-2019). Progress updates shall be provided in LADWP's Annual Owens Valley Report, and may include visual observations of recruitment and composition of site if changing.

3. Monitoring in the fifth year (2019) shall include cover and composition data for the 9-acre exclosure, as well recommendations for future management if relevant.

Since there is notable diversity of mature native plants already onsite and a seed source is readily available, no additional seeding is proposed at this time. Disrupting the soil may promote dust emissions, and simply fencing to eliminate disturbances has been effective for many of LADWP's revegetation projects to date when combined with time and adequate precipitation. Further, drill seeding and buried drip irrigation methods are not practical as a first step due to the rocky terrain in this area.

Monitoring data in the fifth year post-implementation will guide future management of the site. This Plan will be reevaluated at that time and other measures may be recommended to meet success criteria if not yet achieved.

Success Criteria

Live native species cover of 35% within the 9-acre exclosure, composed of four native species. Once success criteria has been met, exclosure fencing will be removed and the area will be managed in accordance with the active grazing lease.

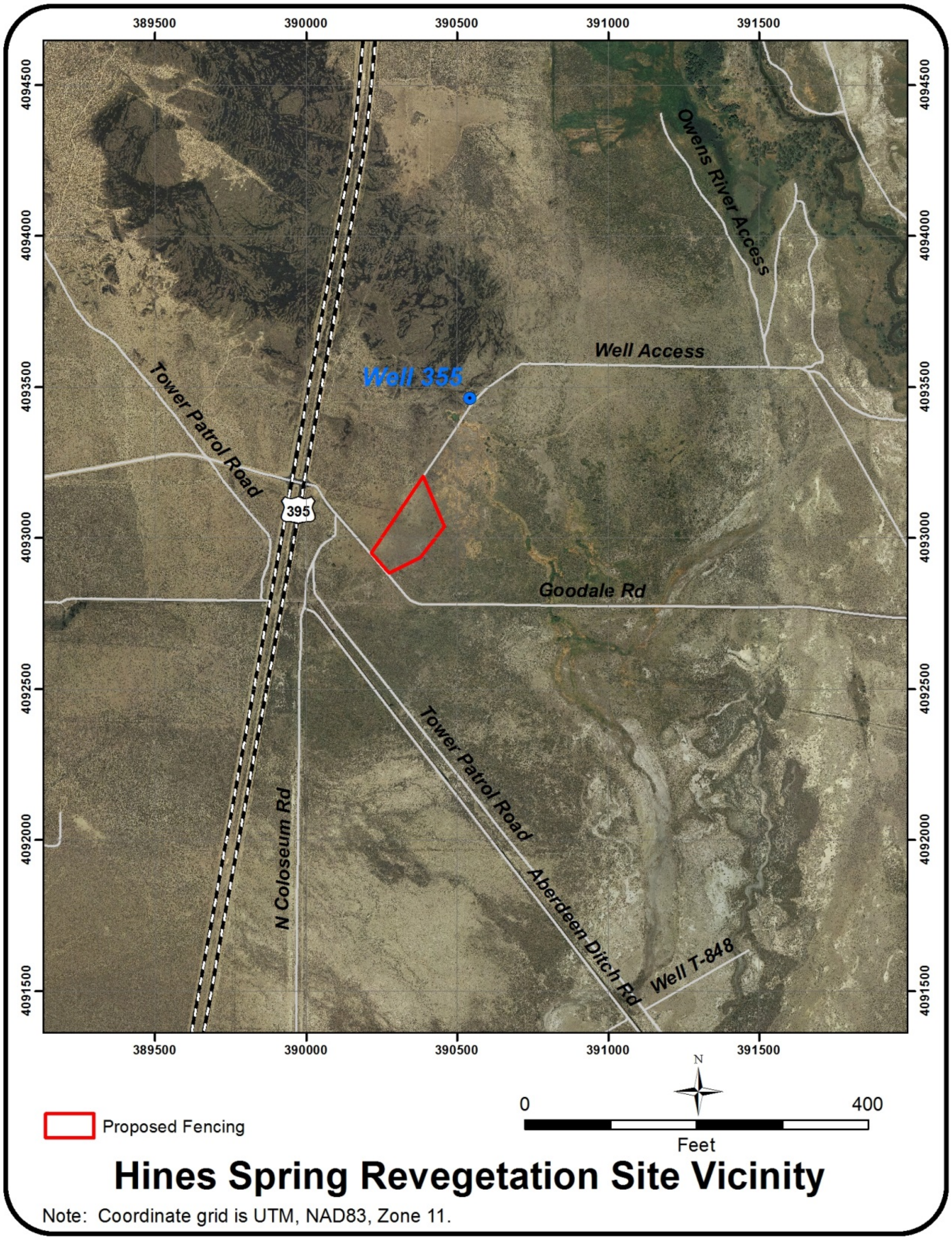


Figure 5. 3 Hines Spring Revegetation Site Vicinity

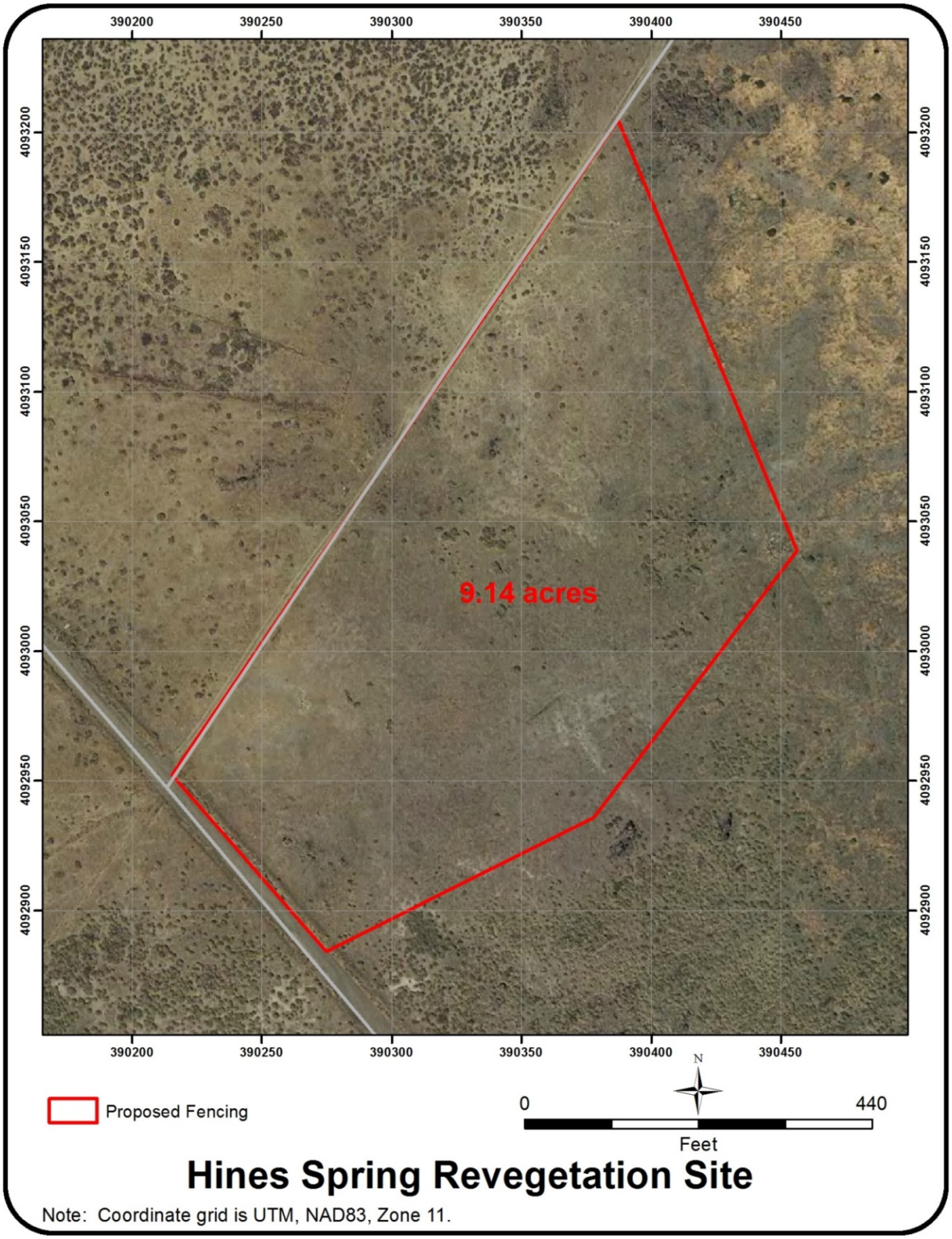


Figure 5. 4 Exclosure to be Constructed for Hines Spring S Revegetation Efforts

6. STATUS OF OTHER STUDIES, PROJECTS, AND ACTIVITIES

6. STATUS OF OTHER STUDIES, PROJECTS, AND ACTIVITIES

The following describes the status of studies, projects, and activities conducted under the *1991 Agreement between the County of Inyo and the City of Los Angeles and its Department of Water and Power on a Long Term Groundwater Management Plan for Owens Valley and Inyo County* (Water Agreement). A description of current Cooperative Studies between Inyo County and Los Angeles is also provided in this section. Finally, mitigation and monitoring efforts in the Laws and Big Pine areas are described in this section and an overview of invasive species treatment measures taken on City lands in the last year.

6.1. Water Agreement Provisions

Table 6. 1 Water Agreement Provisions

INYO/LA LONG TERM WATER AGREEMENT			
TITLE	**PROVISION**	**PROGRESS TO DATE**	**STATUS**
Groundwater Management	Inyo and LADWP are to manage water resources within Inyo County to avoid certain described decreases and changes in vegetation and to cause no significant effect on the environment which cannot be acceptably mitigated while providing a reliable supply of water for export to Los Angeles and for use in Inyo County.	By agreement of the Standing Committee, implementation of groundwater management pursuant to the Agreement commenced in 1987.	Implemented and ongoing
New Wells & Production Capacity	In order to provide for increased operational flexibility and to facilitate rotational pumping, LADWP may replace existing wells and construct new wells in areas where hydrogeologic conditions are favorable and where operation of such wells will not cause a change in vegetation that would be inconsistent with the agreement.	The Water Agreement and 1991 EIR describe 15 new wells that LADWP proposes to construct in the Owens Valley. LADWP has constructed 6 replacement wells on Bishop Cone and one of the 15 new wells allowed under the Water Agreement (located in Lone Pine). The Technical Group must establish management for the well before it can be operated. Currently, LADWP is planning to construct 2 new wells on the Bishop Cone. There were 13 wells previously replaced that have been abandoned or converted to monitoring wells	In progress

TITLE	PROVISION	PROGRESS TO DATE	STATUS
Groundwater Pumping on the Bishop Cone	Before LADWP may increase groundwater pumping on the Bishop Cone, or construct new wells on the Cone, Inyo and LADWP are to develop an audit procedure for determining the exact amount of water annually used on Los Angeles-owned land on the Cone. LADWP pumping on the Cone must be in strict adherence to the provisions of the "Hillside Decree."	The Standing Committee has adopted the Bishop Cone audit procedure. The audit has been conducted since 1996. In 1998, the Superior Court entered a "Memorandum of Judgment" in *Matlick vs. City of Los Angeles* which reaffirmed LADWP's pumping practices on the Bishop Cone. Current audits do not account for stockwater use and ditch losses on the Bishop Cone. Audit protocols should be updated to properly reflect these sources of water supplied to the Bishop Cone.	Ongoing
Groundwater Recharge Facilities	LADWP may construct groundwater banking and groundwater recharge facilities in the County. The EIR describes certain groundwater recharge facilities in Laws, Big Pine, and Rose Valley.	LADWP has not proposed construction of groundwater recharge facilities in Laws, Big Pine, or Rose Valley.	Not proposed at this time
Cooperative Studies	LADWP may provide funding for the costs of conducting studies related to the effects of groundwater pumping on the environment of the Owens Valley.	Studies approved by the Standing Committee are underway.	Ongoing
Enhancement/ Mitigation Projects	All existing E/M projects will be maintained, unless the Standing Committee agrees to modify or discontinue a project, and new projects may be implemented if approved by the Standing Committee. The agreement provides that E/M projects will continue to be supplied by E/M wells unless otherwise agreed.	All Enhancement Mitigation Projects defined in the 1991 EIR are complete or have been implemented and are ongoing. See Enhancement Mitigation table for more information.	Implemented and ongoing.

TITLE	PROVISION	PROGRESS TO DATE	STATUS
Town Water Systems	LADWP will transfer to Inyo County, or another Owens Valley public entity or entities, ownership of the water systems in the communities of Lone Pine, Independence, and Laws. Prior to transferring the systems, evaluations of each system will be performed by a mutually agreed upon consultant, and if necessary, work will be done to upgrade the systems. LADWP will provide free water, up to specified amounts for each town.	Inyo County contracted with a private company to assume the operation, maintenance and billing for the systems in July 1999. Pursuant to an agreement with LADWP, the County completed upgrades of the systems in December 2002, using $2.6M in funds provided by LADWP. LADWP completed the transfer of ownership to Inyo County in January 2005.	Complete
Lower Owens River (financial commitment)	Project description is contained under MOU provisions below. Los Angeles will pay the costs of implementing the project. Inyo County will repay Los Angeles one half of the project costs up to maximum of $3.75 million. Any funds provided for the project from sources other than Los Angeles will be an off-set against Inyo County's repayment obligation. Los Angeles will pay the annual costs of operating the pumpback system. Inyo County and Los Angeles will each pay one half of the other costs of the project.	As part of a negotiated agreement with Inyo County to not pursue funding from the USEPA, LADWP has credited Inyo County $5.1 million to cover Inyo County's $3.75 million obligation for LORP implementation with the remaining $1.35 million to be used by Inyo County towards post implementation costs. LADWP and Inyo County continue to share costs of operations and maintenance of the LORP per the LORP Post Implementation Agreement.	Implemented and ongoing
Haiwee Reservoir	Inyo County and Los Angeles will develop a recreational plan for South Haiwee. The recreation plan will be implemented and operated by Inyo County or a concessionaire. Any plan must take into account Los Angeles' operating and security needs.	A recreational plan has not been developed. A security audit was performed following the September 11, 2001 national security incident. This audit concluded that due to a potential security threat to a municipal water source, Haiwee Reservoir should be closed to the public. CEQA documentation (Negative Declaration) was filed to close Haiwee Reservoir on December 16, 2004. The facility was officially closed to the public in 2005.	Complete

TITLE	PROVISION	PROGRESS TO DATE	STATUS
Saltcedar Control	LADWP is to provide funding to Inyo County to implement a Saltcedar Control Program: $750,000 during the first three years of the program; thereafter, $50,000 per year (adjusted upward or downward in accordance with the consumer price index).	LADWP initiated payments and ICWD initiated the Saltcedar Control Program in 1997. In 2013, LADWP paid ICWD $70,106 for this work. LADWP has paid Inyo County $1,606,154 since 1997 under this provision of the Water Agreement. In 2004, as part of a Wildlife Conservation Board (WCB) grant, LADWP provided $56,000 for Saltcedar control, and the balance of the program was funded from a WCB grant for $490,000 obtained by Inyo County working in cooperation with LADWP. Approval for a second grant from the WCB for $560,000 was received in February 2004. In addition to the monies provided under the Water Agreement for Saltcedar control, LADWP committed, as part of the 2004 Stipulation and Order, to match the amount of grant monies the ICWD received up to $1.5 million for additional Saltcedar control in the LORP area. Under Item 6 of the Stipulation and Order, LADWP has paid Inyo County a total of $1,131,444 as of February 2011, leaving a balance of $368,555 available to Inyo County per the Stipulation and Order. A third grant for $600,000 from the WCB was received by ICWD in November 2007.	Implemented and ongoing.

TITLE	PROVISION	PROGRESS TO DATE	STATUS
Park Rehabilitation, Development, & Maintenance	During the 10 year period following entry of the Stipulation and Order, LADWP is to provide up to $2 million to Inyo to rehabilitate existing County parks and campgrounds and to develop new recreational facilities. LADWP is to make an annual payment of $100,000 (adjusted upward or downward in accordance with the consumers price index) to Inyo to maintain existing and new recreational facilities.	The remainder of the money available for parks rehabilitation and maintenance is $21,954. In addition, LADWP has provided annual payments to Inyo County for parks operation and maintenance activities including a payment in 2013 of $149,659 for a total of $2,141,795. LADWP has paid Inyo County over $3,973,709 since 1997 under this provision of the Agreement.	Implemented and ongoing.
Owens River Recreational Use Plan	As part of the parks rehabilitation program, Inyo is to develop a plan for recreational use and management of the Owens River from Pleasant Valley Reservoir to the Owens River delta as one of the first new programs.	Inyo County Water Department initiated this project in 2007 by forming a collaborative group to gather preliminary information. In 2010, MIG Consultants were selected to write the LORP Recreational Use Plan. A Draft Recreation Use Plan was released February 2012. This plan was presented to the Standing Committee and the public in October 2012. Next steps include further review of the draft plan, CEQA evaluation and obtaining permits prior to implementation of the project.	In progress.
Financial Assistance for Water Related Activities	LADWP is to make an annual payment to Inyo to assist the County in funding water and environmentally related activities. The annual payment is to be adjusted upward or downward each year in accordance with the consumer's price index.	Los Angeles has provided annual payments to Inyo County, and provided $1,395,007 in July 2013. Funds provided by Los Angeles have been expended to fund Inyo County Water Department. LADWP has paid Inyo County over $27 million since 1988 for this purpose.	Implemented and ongoing.

TITLE	PROVISION	PROGRESS TO DATE	STATUS
General Financial Assistance to the County	LADWP is to make an annual payment to Inyo to assist the County in providing services to its citizens. The annual payment is to be adjusted upward or downward each year in accordance with a formula in the State Constitution for an assessment of Los Angeles-owned property in Inyo County.	Los Angeles has provided annual payments to Inyo County, and provided $3,198,104 in 2013. Funds provided by Los Angeles have been deposited into Inyo County's General Fund and expended on Inyo County services as directed by the Board of Supervisors. LADWP has paid Inyo County more than $49 million since 1991 for this purpose.	Implemented and ongoing.
Big Pine Ditch System	LADWP is to provide up to $100,000 for reconstruction and upgrading of the Big Pine ditch system. LADWP is to supply up to 6 cfs to the ditch system from a new well to be constructed west of Big Pine.	The Standing Committee approved procedures and guidelines for implementing the project in 1998. A Mitigated Negative Declaration has been completed. The Inyo/Los Angeles Water Agreement has been modified to provide a reliable water supply of 300 AF for the project. The Big Pine Irrigation and Improvement Association has implemented all Phases of the project. LADWP has provided $99,745 of the $100,000 committed to the project. The Improved Big Pine Ditch System has been in operation since 2005. After test pumping and identification of a monitoring site for Well 415 to supply supplemental water and make up water for the ditch system, a contract will be considered for the installation of another well in Bell Canyon to provide additional water for the project.	In progress.

TITLE	PROVISION	PROGRESS TO DATE	STATUS
Park & Environmental Assistance to City of Bishop	LADWP is to make an annual payment to the City of Bishop to assist the City in maintaining its park and for other environment-related activities. The payment of $125,000 is to be adjusted upward or downward each year in accordance with the consumers' price index. Inyo County shall make an annual payment to the City of Bishop in an amount equal to the payment made by LADWP.	Los Angeles has provided annual payments to the City of Bishop, and provided $187,075 in 2013. LADWP has paid the City of Bishop $2,751,101 since 1997 for this purpose. Inyo County has made its required payment under this section of the agreement.	Implemented and ongoing.
Release of City Owned Lands	Los Angeles is to sell 26 acres of surplus City land within the Bishop city limits; and LADWP is to release 75 acres of City-owned land in areas noted on Exhibit B of the Water Agreement, for public or private development.	LADWP sold 26 acres within Bishop city limits in 1995. LADWP sold 5.54 acres of property prior to 2002 that counts toward the 75 acre commitment. In 2002 Inyo County approached LADWP to request additional lands to be offered for sale. In 2008 LADWP offered 24.38 acres for sale at public auction. One parcel, 0.16 acres, sold. On March 23, 2011, LADWP offered 56.63 acres for sale at public auction. Five parcels totaling 10.51 acres sold.	On hold pending further discussion with Inyo County.

TITLE	PROVISION	PROGRESS TO DATE	STATUS
Additional Sales of City-Owned Lands	LADWP will negotiate in good faith for the sale of additional surplus Los Angeles-owned land in or near valley towns for specific identified needs. Any such sales are to occur subsequent to those described above.	LADWP periodically examines its land inventories to determine additional properties to be sold at auction as surplus. In 2011 LADWP sold to Caltrans a land parcel located in the town of Independence for expansion of their maintenance yard. LADWP granted to the City of Bishop two right of way easements for road projects. In 2012 there were no sales. 2013 LADWP sold into private ownership 2.82 acres located at 789 Home Street, Bishop. Escrow has been extended in 2015 pending City of Bishop's approval of a subdivision. 2015, LADWP is negotiating the sale of 1.02 acres of leased property located in Big Pine to the Big Pine Volunteer Fire Department, 3.48 acres located in Bishop to the City of Bishop for the development of affordable housing for the elderly and disabled, 51.5 acres to Mono County for Pumice Valley Landfill, and four road easements to Caltrans and Inyo County.	Implemented and ongoing.

TITLE	PROVISION	PROGRESS TO DATE	STATUS
Lands for Public Purposes	Los Angeles will negotiate in good faith for the sale or lease to the County of any Los Angeles-owned land requested by the County for use as a public park or for other public purposes.	In 2012-13 LADWP entered into the following leases: two leases for parks with the County of Inyo, one lease for a continuation school with Bishop Union High School, one lease for a campground with the Superintendent of Schools, one lease for a Landfill with the County of Mono, two leases for volunteer fire departments with the City of Bishop, two leases for public parking with the City of Bishop, one lease for the Sierra Nevada Aquatic Research Laboratory with the Regents of California, two license agreements for monitoring sites at sewer treatment facilities for the City of Bishop and Eastern Sierra Community Service District, one license for telecommunication with the Red Cross, and one permit for a community garden with Metabolic Studio.	Implemented and ongoing.

TITLE	PROVISION	PROGRESS TO DATE	STATUS
Lands for Public Purposes, continued.		2013 LADWP entered into the following leases with Inyo County:• BL-1468 – A borrow material site for $500/year• LA-821 – Inyo County Sheriff Mazourka Canyon Telecommunication Site - $500/year• BL-1520 – Independence Little League Field $500/year LADWP is negotiating the following agreements with Inyo County: • 2014-2015, LADWP entered into agreements for the use of City property with: Lone Pine Unified School District for use by the Future Farmers of America ($600/year) and Inyo County for a borrow pit ($500/year). LADWP is negotiating the following agreements for public purposes: BL-813 – Schober Lane Campground• BL-1377 – Glacier View Campground• BL-814-Millpond Recreation Facility• BL-1387-Lone Pine Landfill• BL-1284-Sunland Landfill• BL-1385 – Independence Landfill, BL-1340 Bishop Country Club, BL 1373 Mt. Whitney Golf Club, BL 1279 Water Tank (City of Bishop): LADWP is negotiating the following projects with Inyo County: • Sale of an easement for the extension of See Vee Lane• Sale of an easement for Butcher Lane in Big Pine• Bike Lane path along Ed Powers Road• Sunland Drive Road shoulder widening and bike path• Sale of an easement for the Independence Water Reservoir	

TITLE	PROVISION	PROGRESS TO DATE	STATUS
Legislative Coordination	Except under certain circumstances, Inyo and LA are to refrain from seeking or supporting any legislation, administrative regulation, or litigation that would weaken or strengthen local or state authority to regulate groundwater or that would affect any provision of the agreement.	The legislative coordination policy has been followed.	Ongoing.
Exchange of Data	The County and LADWP shall make any data or information in its possession that reasonably pertains to purposes of the Water Agreement available to the other party with reasonable notice.	The County and LADWP are exchanging data and information.	Ongoing.
Dispute Resolution	The agreement provides a process for resolving disputes between Inyo and LA regarding issues related to the agreement or the Green Book.	Issues concerning annual pumping programs and operation of the McNally Canals have been resolved utilizing the dispute resolution procedures outlined in the Water Agreement.	Ongoing.

6.2. Cooperative Studies

6.2.1. Green Book Revision Cooperative Study Status

ICWD and LADWP have been working on cooperative studies intended to facilitate improvements to the Green Book since 2007. Work on the Green Book revision cooperative study is being conducted under the *Framework and Procedures for Developing Revisions to the Green Book* document as approved by the Standing Committee on November 27, 2006. An outline of the cooperative studies being addressed for the Green Book revision effort are included in the *Working Document, Outline of Issues and Tasks for Revising the Green Book and Related Issues* (Working Document), November 2007.

The Working Document is divided into four general sections and 11 tasks. A description of the tasks included in the Working Document follows:

- Hydrologic Management Issues
    - Development of new or improved operational triggers for pumping wells
    - Re-evaluate groundwater mining provisions
    - Procedures for new wells
    - Surface water management
- Monitoring Issues
    - Vegetation monitoring
    - Hydrologic Monitoring (groundwater, surface water, and precipitation)
- Goal Attainment
    - Compliance monitoring
    - Attributability
    - Significance
- Revise Draft Green Book
    - Draft Green Book revisions
    - Seek approval of Draft Green Book revisions

Efforts to date have focused on procedures for developing new operational triggers for pumping wells and improving the procedures for installing new wells and replacing existing wells. The task to cooperatively address vegetation monitoring also began in early 2010.

Efforts to include a facilitator and assistance from the Ecological Society of America for the Green Book revision effort are in progress.

6.3. Irrigation Project in the Laws Area

6.3.1.Laws 2003 Revegetation Plan

Introduction

The Revegetation Plans for Lands Removed from Irrigation Laws Parcels 90, 95, and 129 and Abandoned Agricultural Land Parcel 94 (Laws 2003 Plan) (January 2003) established goals to restore native vegetation in each of these parcels that is similar in cover and species composition to nearby sites. In this Plan, conditions, goals, schedules, and monitoring protocols were prescribed. Goals and species lists in the Plan were developed from National Resources Conservation Service Ecological Site Descriptions and a subset of nearby parcels extracted from LADWP's 1984-1987 vegetation inventory data. Under this Plan, all 253 acres of these parcels were to be successfully revegetated by 2013 and persist for an additional two years with no onsite revegetation activities.

Early years spent on the Laws revegetation effort were focused on studies of approaches that could be applied on a more comprehensive scale (LADWP and MWH 2004, SAIC 2003) given the extensive scope of the project. Most treatments in these early studies failed, including drill seeding with no additional treatments or irrigation, mulch and manure application in seeded areas, canal spoils treatment, polymer treatments, furrowing, wind breaks, water harvesting, and hand watering.

Broadcast and drill seeding were attempted in some sections of the parcels but have been met with little success. LADWP also purchased and planted greenhouse-propagated plants from third party vendors to assist in reaching mitigation goals, but received many plants without well-established root systems that could not persist once placed in the natural elements. As a consequence, LADWP has since purchased and operates two greenhouses that are capable of producing up to 18,000 native plants twice a year for summer and fall plantings. Generating the plants from seed in-house has resulted in a much more robust product that can withstand the harsh environmental elements at Laws and has proven to be the most successful method of dryland revegetation used to date at this location.

Since 2003, LADWP has explored different forms of irrigation to aid in revegetation and jumpstart natural recruitment within these parcels (e.g., above ground drip irrigation, hand watering, buried driplines, water cannons, etc.). Buried drip has proven to be the most effective watering technique used thus far. Since 2008, LADWP has installed nearly 190 miles of drip lines with approximately 122,000 emitters at Laws 90, 94, 95, 129, 118, and the Laws Native Seed Farm (Laws 27). Timing and frequency of watering has varied in response to plant needs and climatic conditions.

Rodent herbivory has continued to be a challenge across all parcels, and LADWP now installs protective cages around plantings to promote early establishment. Other challenges include the management of and competition from tumbleweeds

(*Salsola tragus*), and ongoing soil movement, dunal formation, and dust emissivity from high valley winds.

Despite these challenges, LADWP has acted in good faith and has planted approximately 200 acres of the 253 acres across Laws 90, 94, 95, 118, and 129, as well as 92 acres at the Laws Native Seed Farm to date. These efforts totaled nearly 100,000 greenhouse-propagated plants and hundreds of pounds of seed. Additionally, LADWP has all 253 total acres in the Laws 2003 Plan plumbed with irrigation systems supplying water to existing plants (or ready to supply future plantings) within these parcels. However, success criteria specified in the 2003 Plan are not being met and likely won't be for some time due to many factors. These include the extensive scope of the project, volume limitations of the two existing greenhouses, ongoing operation and maintenance of an expansive irrigation system, rodent herbivory, consecutive drought years, and shear from strong seasonal winds.

2014 Planting Efforts

In March 2014, a total of 8,927 containerized plants were planted at LAWS 90. Species included *Atriplex polycarpa* (ATPO), *Krascheninnikovia lanata* (KRLA), *Grayia spinosa* (GRSP), *Elemus eleymoides* (ELEL), *Leymus triticoides* (LETR5), *Sporobolus airoides* (SPAI), and Atriplex canescens (ATCA2).

Number of plants by species planted at LAWS 90 in March 2014

Species	**Total**
ATPO	3373
KRLA	1796
GRSP	648
ELEL	1600
LETR5	35
SPAI	1300
ATCA2	175
TOTAL	**8927**

In October 2014, an additional 13,650 containerized plants were planted at LAWS 90 and LAWS 94/95. Approximately 10,000 plants were planted in LAWS 90 with the remainder being planted in areas of low success in LAWS 94/95. Species included *Atriplex polycarpa* (ATPO), *Krascheninnikovia lanata* (KRLA), Atriplex canescens, (ATCA2), *Atriplex confertifolia* (ATCO), *and Ephedra nevadensis* (EPNE).

Number of plants by species planted at LAWS 90 and LAWS 94/95 October 2014

Species	**Total**
ATPO	6189
ATCO	100
ATCA2	3161
EPNE	800
KRLA	3400
TOTAL	**13650**

As of October 2014, all of LAWS 90 has been planted with containerized plants. Survivorship of these plantings will be assessed in the future. Revegetation efforts are planned to move to parcel LAWS 129 for spring of 2015.

Planting Schedule

LADWP originally outplanted dispersed sections in each parcel to encourage natural recruitment to fill in adjacent open areas. This unassisted recruitment has not occurred at a rate that will meet the 2003 Plan's goals. As a consequence, LADWP has proceeded in recent years with planting out each parcel entirely one time before returning to replant areas within the same parcel. As mentioned above, LADWP has planted 100% of parcels 90, 94, and 95 and will be planting at Laws 129 in spring 2015.

Below is the tentative schedule for planting in the next two years. After all parcels have been initially planted, parcels will be reassessed to evaluate if success criteria has been met. If not, some areas may be replanted as necessary or treated with alternative methods as they become available.

Parcels	Acres	% Currently Planted	Proposed Completion of Initial Plantings
Laws 129	47	25%	Spring 2016
Portion of Laws 118	19	0%	Fall 2016

Additionally, LADWP will continue with planting the remainder of the Laws Native Seed Farm (Laws 27) following Laws 118, or sooner if possible within the next five years. Portions of the Native Seed Farm are currently well established and are producing viable seeds for LADWP's revegetation projects in Laws and throughout the Owens Valley as originally planned.

This proposed schedule is based on a maximum number of plants successfully propagated in both greenhouses, twice a year and does not account for unforeseen circumstances (e.g., pests, unviable seed, etc.).

Operations

Laws 90 and 129 have fully installed buried drip irrigation systems. LAWS 94/95 currently have a combination of buried and aboveground drip across both parcels; the above ground drip will be converted to a buried drip at a later date but has been initially planted. The 19 acre portion of Laws 118 covered in the Laws 2003 Plan has a complete irrigation system installed. The Laws Native Seed Farm has a combination of sprinkler irrigation, buried driplines, and above ground drip irrigation.

The current irrigation schedule being utilized within the planted portions of the parcels includes:

- Fall/Winter: once a month for 7-8 hours for established sections;
  new plants may get additional water if they appear dry

- Spring/Summer: twice a month for 7-8 hours for established sections; new plants may get additional water if they appear dry

Water cannons, water trucks, and irrigation systems also provide supplemental water as necessary for dust control.

Maintenance

Current maintenance of existing irrigation systems includes: monitoring system for leaks or other obvious problems such as broken lines or piping, broken risers to sprinkler lines, automatic valves not operating correctly, and filters getting clogged. Additionally, mowing and clearing of tumbleweeds occur as equipment and manpower is available.

Demonstration Projects

Based on collaborative input with the ICWD technical staff, LADWP is currently in the process of implementing a series of demonstration projects at Laws 90. They include: pre-emergent weed control, sand fencing, hay bale placement, exclusionary fencing, and mulch application. Some of these treatments will also be applied to Laws 129 in spring 2015. These treatments could be used individually in any of the parcels as needed, or in combination with other techniques. These techniques have not been attempted at Laws, in combination with other treatments, or were attempted at a different scale. Effectiveness of these demonstration projects will be discussed in future Owens Valley Annual Reports.

Table 6. 2 Laws Revegetation Plan

LAWS REVEGETATION PLAN (2003)			
TITLE	**PROVISON**	**PROGRESS TO DATE**	**STATUS**
LAWS 90	Native revegetation of 101 acres of abandoned agriculture land with 10% cover, ten native species (Including one native grass).	Drip irrigation system is fully installed. Planting in this large parcel is approximately 75% complete. Approximately 2,500 plants were planted in the fall of 2013. Additional planting is scheduled for spring and fall 2014 and should conclude the initial planting of this parcel. In 2014, LADWP implemented a series of demonstration projects at Laws 90 including pre-emergent weed control, sand fencing, hay bale placement, exclusionary fencing, and mulch application. These techniques have not been attempted at Laws, in combination with other treatments, or were attempted at a different scale. Knowledge gained from these demonstration projects may help guide future revegetation efforts in the Laws area.	Initial planting across all 101 acres is 100% complete, but has not yet achieved success criteria.
LAWS 94	Native revegetation of 40 acres of abandoned agriculture land with 10% cover, ten native species (Including one native grass).	LAWS 94/95 currently have a combination of buried and aboveground drip across both parcels; the above ground drip will be converted to a buried drip at a later date but has been initially planted. In 2013, approximately 9,000 plants were placed at LAWS 94/95. The initial planting for the entire parcel was completed in Fall 2013.	Initial planting across all 40 acres complete, but has not yet achieved success criteria.
LAWS95	Native revegetation of 46 acres of abandoned agriculture land with 10% cover, ten native species (Including one native grass).	LAWS 94/95 currently have a combination of buried and aboveground drip across both parcels; the above ground drip will be converted to a buried drip at a later date but has been initially planted. In 2013, approximately 9,000 plants were placed at LAWS 94/95. The initial planting for the entire parcel was completed in Fall 2013.	Initial planting across all 46 acres complete, but has not yet achieved success criteria.

TITLE	PROVISON	PROGRESS TO DATE	STATUS
LAWS 118 (19 acre portion)	Native revegetation of 19 acre portion of LAWS 118 (in addition to 139 acres required under 1999 Revegetation Plan above) with 10% cover, eight native species (including one native grass).	The 19 acre portion of Laws 118 covered in the Laws 2003 Plan has a complete irrigation system installed. Initial planting is approximately 25% complete. Further planting expected spring 2016.	Initial planting approximately 25% complete; has not yet achieved success criteria. Planting in this parcel ongoing.
LAWS 129	Native revegetation of 47 acres of abandoned agriculture land with 10% cover, eight native species (Including one native grass).	Drip irrigation system fully installed. Planting in this parcel is approximately 25% complete. In the Spring of 2012, approximately 2,000 plants were placed at buried drip emitters. Additional plantings are scheduled for Spring 2015.	Initial planting approximately 25% complete; has not yet achieved success criteria. Planting in this parcel ongoing.
LAWS 27 (Native Seed Farm)	Initiate a native seed farm use on Owens Valley Revegetation projects.	A seed farm has been initiated for seed harvest. The seed farm will aid in the implementation of all revegetation projects in the Owens Valley. In addition, LADWP has purchased and operates two greenhouses to grow out up to 18,000 plants biannually for the seed farm and other revegetation efforts. The Laws Native Seed Farm has a combination of sprinkler irrigation, buried driplines, and above ground drip irrigation. LADWP will continue with planting the remainder of the Laws Native Seed Farm (Laws 27) following Laws 118, or sooner if possible within the next five years. Portions of the Native Seed Farm are currently well established and are producing viable seeds for LADWP's revegetation projects in Laws and throughout the Owens Valley as originally planned.	Planting approximately 85% complete.

6.3.2.Mitigation Monitoring Report for the Irrigation Project in the Laws Area

Table 6. 3 Mitigation and Monitoring Program for Irrigation Project in the Laws Area

POT. IMPACT		MITIGATION			MONITORING			
Summary of Impact	**MM No.**	**Measure**	**Timing**	**Responsibility**	**Method**	**Period**	**Frequency**	**Responsibility**
Air Quality								
Creation of dust during pipeline installation and ground preparation for planting.	M-1	Ground surfaces will be thoroughly wet prior to and during work to minimize dust.	To be implemented throughout the project as needed.	LADWP construction staff and/or LADWP lessee.	Water trucks will pre-wet construction areas and water as necessary throughout construction. Ground will be pre-irrigated prior to planting.	As needed throughout construction and/ or prior to planting.	Throughout the construction or agricultural period.	LADWP construction staff and/or LADWP lessee.
Groundwater pumping to supply water to the project could adversely affect groundwater dependent vegetation in the vicinity of the project and cause blowing dust.	M-2	Section III and Section IV of the Agreement between the County of Inyo and the City of Los Angeles and its Department of Water and Power on a Long Term Groundwater Management Plan for Owens Valley and Inyo County	To be implemented throughout the project as needed.	Inyo/Los Angeles Technical Group	Annual monitoring of the vegetation in the vicinity is being conducted.	During the period when groundwater pumping and water management practices could affect vegetation.	Annually during the growing season.	Inyo/Los Angeles Technical Group
Hydrology and Water Quality								
Groundwater pumping	M-3	Water Agreement	To be implemented throughout the project as needed.	Inyo/Los Angeles Technical Group	Monitoring at each identified site will consist of one or more field visits during the period when groundwater pumping and water management practices could affect such vegetation.	During the period when groundwater pumping and water management practices could affect vegetation.	Annually during the growing season.	Inyo/Los Angeles Technical Group

POT. IMPACT		MITIGATION			MONITORING			
Summary of Impact	**MM No.**	**Measure**	**Timing**	**Responsibility**	**Method**	**Period**	**Frequency**	**Responsibility**
Reducing the irrigation duty from 5 AF per acre to 3 AF per acre and of changing from flood irrigation to sprinkler irrigation.	M-4	Water Agreement	To be implemented throughout the work as needed.	Inyo/Los Angeles Technical Group	Monitoring at each identified site will consist of one or more field visits during the period when groundwater pumping and surface water management practices could affect such vegetation.	During irrigation season	Annually during the growing season.	Inyo/Los Angeles Technical Group
Biological Resources								
Altering the flow in a ditch that carries water diverted from Coldwater Canyon.	M-5	Water Agreement	To be implemented throughout the work as needed.	Inyo/Los Angeles Technical Group	Monitoring at each identified site will consist of one or more field visits during the period when surface water management practices could affect such vegetation.	During the period of changes in surface water management practices could affect vegetation.	Annually during the growing season.	Inyo/Los Angeles Technical Group
Altering the flow in Silver Canyon Ditch.	M-6	Water Agreement	To be implemented throughout the work as needed.	Inyo/Los Angeles Technical Group	Monitoring at each identified site will consist of one or more field visits during the period when surface water management practices could affect such vegetation.	During the period of changes in surface water management practices could affect vegetation.	Annually during the growing season.	Inyo/Los Angeles Technical Group
Growth of noxious weeds	M-7	LADWP or its lessee or lessees, in conjunction with Inyo County's weed abatement program, will promptly treat or remove the weed.	To be implemented throughout the work as needed.	LADWP Watershed Resources Staff; LADWP Lessee; and/or Inyo County Agricultural Department.	Monitoring consists of field visits during the growing season.	Annually during the growing season.	Annually during the growing season.	LADWP Watershed Resources Staff; LADWP Lessee; and/or Inyo County Agricultural Department.

POT. IMPACT		MITIGATION			MONITORING			
Summary of Impact	**MM No.**	**Measure**	**Timing**	**Responsibility**	**Method**	**Period**	**Frequency**	**Responsibility**
Cultural Resources								
Archaeological investigations identified six previously unrecorded archaeological sites and 11 isolates within the project area.	M-8	Pipeline placement was to avoid identified sites; if new sites are encountered during implementation, work will be halted until an archaeologist can be consulted.	To be implemented throughout the work as needed.	LADWP Construction Manager	Construction personnel will monitor for unidentified sites during the progression of construction.	During construction activities.	Throughout the construction period.	LADWP Construction Manager

6.3.3.Mitigation Measures

Mitigation Measure M-1

Impact: Creation of dust during pipeline installation and ground preparation for planting.

Measure: Ground surfaces will be thoroughly wet prior to and during work to minimize dust.

All seeding work during 2006 was conducted utilizing the Truax No-till drill seeder. Water was applied before initiating seeding and following seeding to control dust emissions.

Mitigation Measure M-2 and M-3

Impact: Groundwater pumping to supply water to the project could adversely affect groundwater-dependent vegetation in the vicinity of the project and cause blowing dust.

Measure: *1991 Agreement between the County of Inyo and the City of Los Angeles and its Department of Water and Power on a Long Term Groundwater Management Plan for Owens Valley and Inyo County* (Water Agreement).

Table 6.4 illustrates the vegetation cover in vegetation parcels within the Laws Wellfield as determined by ICWD. Data from 2002 and 2003 indicates estimates of vegetation cover in the parcels prior to implementation of the irrigation project in the Laws area. Data since 2004 are estimates of vegetation cover after implementation of the irrigation project in the Laws area.

Table 6.5 illustrates the depth to water in the Laws area test holes prior to, and after implementation of the irrigation project in the Laws area.

Table 6. 4. Vegetation Cover in Selected Parcels within the Laws Wellfield

Vegetation Parcel	Percent Perennial Cover											
	1986	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
LAW030	23	26	31	50	40	39	36	32	35	22	24	12
LAW035	33	3	14	17	11	13	3	12	17	4	2	1
LAW043	61	5	13	10	16	21	8	11	20	7	3	3
LAW052	28	5	14	11	9	15	15	6	16	8	4	4
LAW062	21	5	11	14	16	22	12	12	17	10	5	4
LAW063	11	9	17	14	19	26	14	15	25	12	6	6
LAW065	10	7	8	11	12	18	12	10	20	7	5	4
LAW070	59	6	8	17	20	21	14	20	23	10	6	3
LAW072	64	nd	nd	nd	nd	nd	nd	nd	nd	nd	10	6
LAW078	52	36	49	54	59	67	69	65	53	35	27	23
LAW082	17	4	5	10	6	9	8	12	10	8	6	5
LAW085	30	7	13	21	26	35	29	31	14	15	6	5
LAW105	26	35	49	48	44	68	41	58	43	43	27	19
LAW107	47	46	68	71	79	80	90	81	65	54	45	31
LAW112	20	17	37	33	38	49	40	31	33	33	14	11
LAW120	26	33	41	47	48	48	50	52	47	35	39	26
LAW122	60	64	73	78	75	70	78	68	77	60	45	42
LAW137-PLC210	22	19	33	32	24	27	20	27	28	21	17	14

**nd is no data*

Table 6. 5 Depth to Water (in feet) for Test Holes in the Laws Wellfield

WELL	April 2004	April 2005	April 2006	April 2007	April 2008	April 2009	April 2010	April 2011	April 2012	April 2013	April 2014	April 2015
T107	30.1	31.9	18.6	21.1	25.2	28.0	31.0	31.8	32.75	33.12	35.29	36.38
T436	10.1	10.2	4.8	5.3	7.1	8.8	9.5	9.5	11.26	11.14	12.99	13.67
T438	11.6	8.9	3.8	6.3	8.2	9.1	11.4	8.6	12.61	12.03	15.75	16.19
T490	14.6	14.7	13.3	10.2	12.6	13.8	13.5	13.3	12.49	13.17	16.64	17.49
T492	32.1	31.5	24.4	23.0	26.8	29.1	30.8	31.7	34.14	32.75	35.61	36.35

Mitigation Measure M-4

Impact: Reducing the irrigation duty from 5 AF per-acre to 3 AF per-acre and of changing from flood irrigation to sprinkler irrigation.

Measure: Water Agreement

LADWP and the Laws Ranch lease jointly determined irrigated field, pasture, or area vegetation condition using the Natural Resource Conservation Service Pasture Condition Assessment. This protocol, once followed, is designed to optimize plant and livestock productivity while minimizing detrimental effects to soil or water resources.

Pasture condition scoring involves the visual evaluation of 10 indicators each having five environmental conditions (Cosgrove et al. 1991). Each indicator is rated separately and the scores are combined into an overall score for the pasture. The overall score for a pasture can then be divided by the total possible score to give a percent rating ({overall score ÷ total possible score} × 100 = percent rating). Not all 10 indicators may be appropriate for use in every pasture. In this case, using less than 10 indicators will reduce the possible score, but the percent rating will still be comparable. Irrigated pastures on the Laws Ranch lease will be evaluated after the area has been seeded and irrigated for at least three growing seasons in order to allow the seeded pasture mix to become fully established. The average pasture score for the Laws Ranch lease during the 2013 growing season was 95%. The next scheduled evaluation is in 2016.

Mitigation Measure M-5

Impact: Altering the flow in a ditch that carries water diverted from Coldwater Canyon.

Measure: Water Agreement

Diversions from Coldwater Canyon Ditch are utilized for irrigation of the Seed Farm. During operation, approximately one-quarter of the total flow remains in the ditch.

Periodic examinations were conducted along the ditch throughout the growing season. These examinations did not indicate any signs of vegetation stress. Photo points have been established along the ditch.

Diversions for irrigation from Coldwater Canyon Ditch for the Laws Seed Farm continued in 2012. Periodic examinations were conducted along the ditch throughout the growing season. These examinations did not indicate any signs of vegetation stress. Photos points were replicated during the 2010 growing season and will be replicated during the 2015 growing season.

Mitigation Measure M-6

Impact: Altering the flow in Silver Canyon Ditch.

Measure: Water Agreement

Diversions from Silver Canyon Ditch are utilized for irrigation of Parcels LAWS 90, 94, and 95. During operation, approximately one-quarter of the total flow remains in the ditch.

Diversions for irrigation from Silver Canyon Ditch for the Laws Parcels 90, 94, and 95, continued in 2012. Periodic examinations were conducted along the ditch throughout the growing season. These examinations did not indicate any signs of vegetation stress. Photo points have been established along the ditch and were replicated during the 2010 growing season and will be replicated during the 2015 growing season.

Mitigation Measure M-7

Impact: Growth of State-rated A or B noxious weeds in the project area.

Measure: LADWP or its lessee or lessees, in conjunction with Inyo County's weed abatement program, will promptly treat or remove the weed.

Surveys were conducted on the irrigation project in the Laws area for noxious weeds during the 2012 growing season. No A or B listed noxious weeds were found. Weed control was conducted in the 2011 season for other weedy species. The lessee treated weeds through a combination of grazing and burning.

Mitigation Measure M-8

Impact: Archaeological investigations identified six previously unrecorded archaeological sites and 11 isolates within the project area.

Measure: Pipeline placement was to avoid identified sites; if new sites are encountered during implementation, work will be halted until an archeologist can be consulted.

No cultural resources were encountered during construction or operation of the irrigation project in the Laws area in 2006.

6.4. Irrigation Project in the Big Pine Area

Table 6. 6 Mitigation and Monitoring Program for the Irrigation Project in the Big Pine Area

POT. IMPACT		MITIGATION			MONITORING			
Summary of Impact	**MM No.**	**Measure**	**Timing**	**Responsibility**	**Method**	**Period**	**Frequency**	**Responsibility**
<u>Hydrology and Water Quality</u>								
The cumulative effect of groundwater pumping from Well W415, the new Bell Canyon well, as proposed in the project, in combination with the operation of other wells in the Big Pine area could cause significant adverse impacts to groundwater dependent vegetation, other vegetation, or non-LADWP wells in the area.	M-1	Water Agreement	To be implemented throughout the project as needed.	Inyo/Los Angeles Technical Group	A monitoring site will be developed by the Inyo/Los Angeles Technical Group as called for in the Inyo/Los Angeles Water Agreement to manage operation of each well.	During the period when groundwater pumping is needed for the project.	As decided by the Inyo/Los Angeles Technical Group, consistent with the Water Agreement.	Inyo/Los Angeles Technical Group

6.5. Invasive Species Treatment and Removal

Background

The LADWP noxious weed treatment program began in 1995 when the first pepperweed (*Lepidium latifolium*) site was found in the Owens Valley. LADWP along with many other agencies formed the Eastern Sierra Weed Management Group in 1999. Since that time, LADWP has had an extensive weed control program which utilizes LADWP personnel and contractors. The primary goal of LADWP's ongoing weed control efforts are to treat rated noxious weeds on City lands in Inyo and Mono Counties.

Additional weed treatments on City lands were provided by Inyo County personnel. Between 2006 and 2012 LADWP provided $200,000 to Inyo County for weed control. Often this money was used as matching funds for grants that significantly increased the funds that could be used to treat weeds in Inyo and Mono Counties.

In June 2012, LADWP took over complete control for weed treatments on City lands in Inyo and Mono Counties, with the exception of the Lower Owens River Project (LORP). For the LORP, a combination of funds from LADWP and Inyo County fund a program that is administered by the Inyo and Mono Counties Agricultural Commissioner's Office.

During the spring of 2012, LADWP began preparing for the transition of responsibilities and a total of five LADWP personnel were assigned to weed management beginning in July 2013. Additional equipment was also dedicated to the project, including two 4-wheel drive pick-up trucks, three quad all-terrain vehicles, and one side by side all-terrain vehicle, all equipped with weed spraying equipment.

Since August 2013, LADWP staff has been treating all sites previously treated by LADWP as well as those previously treated by Inyo County. These sites include the Owens River from Pleasant Valley to the Los Angeles Aqueduct (46 miles) and the unlined section of the Los Angeles Aqueduct (26 miles), as well as outlying areas where pepperweed is known to occur. For areas inaccessible by land, LADWP utilized a contractor with a boat to treat weed infestations along waterways.

In 2014, approximately 7,000 acres were treated. The majority of this treatment focused on waterways in and near Bishop, in addition to the Owens River corridor from Pleasant Valley Reservoir to the Blackrock Waterfowl Management Area (Figure 6.1). At Owens Lake, LADWP staff have surveyed and treated 45 square miles, which included hand removal of saltcedar seedlings where appropriate.

During the 2014 field season, LADWP worked approximately 4,200 worker hours treating weeds throughout the Owens Valley. Every known weed site was treated at least once and many sites were treated multiple times during the growing season. LADWP staff continues to utilize a five person crew that treats rated herbaceous weeds from April through October. Additionally, staff treats saltcedar and Russian Olive from October through March. Because of the drought conditions and the area-wide ban on burning, no slash piles that were created from these treatments in 2013-14 were burned in the past year.

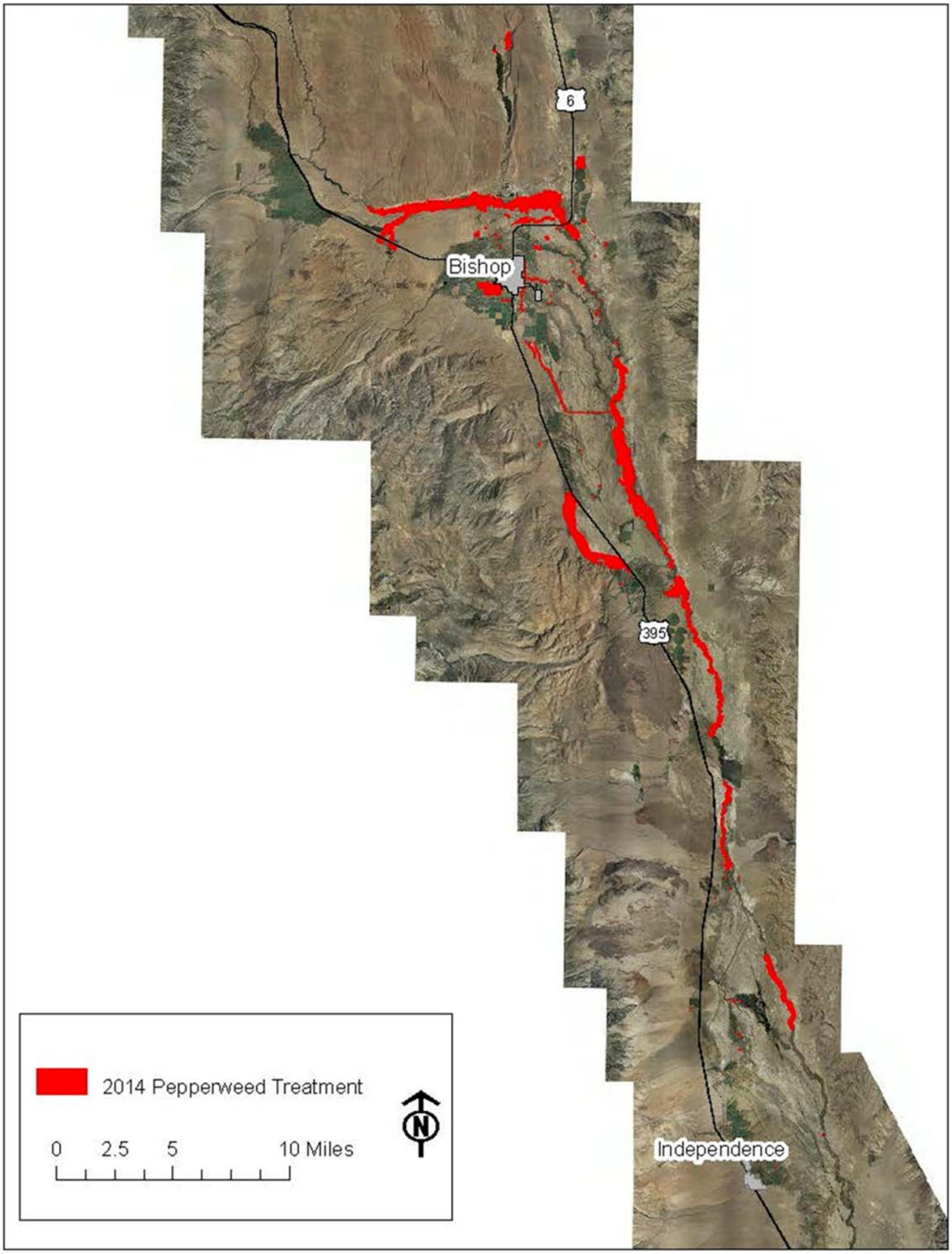


Figure 6. 1 Pepperweed Treatment 2014

7. STATUS OF PROJECTS DEFINED IN THE 1997 MOU

7. STATUS OF PROJECTS DEFINED IN THE 1997 MOU

The following describes the status of projects and activities conducted under the *1997 Memorandum of Understanding between the City of Los Angeles Department of Water and Power, County of Inyo, the California Department of Fish and Game, the California State Lands Commission, the Sierra Club, and the Owens Valley Committee* (1997 MOU). This section provides updates on the Yellow-billed Cuckoo Habitat Enhancement Plan, the Additional Mitigation Projects Developed by the MOU Ad Hoc Group (Additional Mitigation Projects), Inventory of Plants and Animals at springs and seeps, and the Owens Valley Land Management Plan (OVLMP). A more thorough description of the current status and direction of the Lower Owens River Project, which is a requirement of both the 1991 EIR and 1997 MOU, can be found in LADWP and Inyo County's Lower Owens River Project Annual Report.

TABLE 24. 1997 MOU Provisions

	1997 MOU		
	Provision	**Progress to Date**	**Status**
MOU Reference	**Section II-Lower Owens River Project**		
Lower Owens River Project (LORP)	A project to rewater approximately 60 miles of the Owens River channel below the aqueduct intake, the enhancement of several environmental features along and near the river, and the return of water to the aqueduct by means of a pumpback facility near the Owens River Delta. The LORP is also identified in the 1991 EIR as compensatory mitigation for impacts that occurred between 1970 and 1990 that were considered difficult to quantify or mitigate directly. The LORP, as described in the Water Agreement and the 1991 EIR, is augmented by the provisions of the MOU.	Project was implemented in 2006 and project base flows were achieved in 2007. This project is currently being operated and is adaptively managed based on ongoing monitoring.	Implemented and ongoing. Monitoring and Adaptive Management ongoing.
A. LORP PLAN	LADWP and the County will direct and assist Consultants in the preparation and implementation of the LORP ecosystem management plan. This plan will apply to all lands within the LORP Planning area and will address the four physical features of the LORP.	Ecosystem Sciences (ES) has prepared a draft management plan for the project. These plans are listed as draft as the project is based on adaptive management and adjustments may be made in the future. Thus the term "final plan" is not used.	Complete.

MOU Reference			Provision	Progress to Date	Status
			Section II-Lower Owens River Project		
	C. Physical Environmental Features	1. The Lower Owens River Riverine-Riparian System	A continuous flow will be established and maintained in the river channel from at or near the intake structure which diverts the Owens River into the Los Angeles Aqueduct to a pumpback system located near the river delta which will convey water from the river to the Los Angeles Aqueduct. A base flow of approximately 40 cfs rfom at or near the Intake to the Pumpback system will be maintained year round. Additionally, a seasonal habitat flow of up to 200 cfs wil be released annually based on estimated runoff in the Owens River watershed. Any water in the river channel that is above the amount specified in this MOU for release below the pumpback system to supply the Owens River Delta Habitat Area will be recovered by the pumpback system for delivery to Los Angeles.	Project was implemented in 2006 and project base flows were achieved in 2007. Seasonal habitat flows are released annually according to the guidelines provided in the LORP EIR.	Implemented and ongoing.
	C. Physical Environmental Features	2. The Owens River Delta Habitat Area	This feature provides for the enhancement and maintenance of approximately 325 acres of existing habitat and the establishment and maintenance of new habitat consisting of riparian areas and ponds suitable for shorebirds, waterfowl, and other animals. An annual average of approximately 6 to 9 cfs will be released below the pumpback system to supply this area.	Releases for the delta occur simultaneously with the 40 cfs baseflow. No construction was necessary for this component of the project other than the completion of the Pumpback Station.	Implemented and ongoing.

MOU Reference			Provision	Progress to Date	Status
			Section II-Lower Owens River Project		
	C. Physical Environmental Features	3. Off River Lakes and Ponds	Off-river lakes and ponds in the LORP area will be maintained and/or established through flow and land management to provide habitat for fisheries, waterfowl, shorebirds, and other animals. These habitats will be as self-sustaining as possible.	This component of the project is ongoing.	Implemented and ongoing.
	C. Physical Environmental Features	4. The 1500-Acre Blackrock Waterfowl Habitat Area	The goal of this component is to maintain this waterfowl habitat area to provide the opportunity for the establishment of resident and migratory waterfowl populations and to provide habitat for other native species. Diverse natural habitats will be created and maintained through flow and land management to the extent feasible consistent with the needs of the "habitat indicator species" for the Blackrock Waterfowl Habitat Area. These habitats will be as self-sustaining as possible. In average and above runoff years, approximately 500 acres within an overall project area of 1500 acres will be flooded to provide habitat for resident and migratory waterfowl and other native species. In years when the runoff is forecasted to be less than average, the water supply to the area will be reduced in general proportion to the forecasted runoff in the watershed.	All preliminary construction work identified for implementation of the Blackrock Waterfowl component has been completed. The Blackrock Waterfowl Habitat Area is managed in accordance with the LORP EIR.	Implemented and ongoing.
D. Agency Consultation and Public Involvement			Consultation with the Parties, agencies, DWP ranch lessees, and the public converned with the development of the LORP Plan will occur throughout the development and implementation of the LORP Plan.	Ecosystem Sciences prepared a draft management plan for the LORP. The MOU Parties, agencies, DWP ranch lessees, and the public were consulted.	Complete.

	Provision	Progress to Date	Status
MOU Reference	**Section II-Lower Owens River Project**		
E. Monitoring and Reporting Plan - Adaptive Management	Monitoring sites and water flow gaging stations will be identified and a program for data collection, analysis, and reporting will be described as part of this plan. Should the reported information reveal that adaptive modifications to the LORP management are necessary to ensure the successful implementation of the project, or the attainment of the LORP goals, such adaptive modifications will be made.	The LORP Monitoring and Adaptive Management Plan (MAMP) was complete in 2008. Monitoring follows that prescribed in this plan and LADWP generates an annual report each year with monitoring results.	Monitoring and Reporting Plan Complete.Monitoring and Adaptive Management ongoing.
F. LORP EIR	LADWP as the lead agency and the County as responsible agency will jointly prepare an EIR on the LORP. A draft EIR was to be released by June of 2000, but the deadline has been extended by the 1997 MOU Parties. A final EIR will be completed as soon as possible following release of the draft.	The Draft EIR was released November 1, 2002. The public comment period concluded January 14, 2003. The Final EIR was approved by the Board of Water and Power Commissioners in July 2004 and the Inyo County Board of Supervisors in November 2005. LADWP received all the necessary permits for implementation by January 9, 2006 and construction began immediately thereafter.	Complete.
G. Pumpback System	Construction of a pumpback system will commence as soon as possible following the certification of the LORP EIR and will proceed as expeditiously as possible. Construction should be completed within 3 years after it is commenced.	The pumpback system was constructed prior to project implementation. The project was implemented in December 2006.	Complete.

	Provision	Progress to Date	Status
MOU Reference	**Section II-Lower Owens River Project**		
H. Implementation	The baseflow in the river channel will be commenced not later than June 2003 unless circumstances beyond LADWP's control prevent the completion of the pumpback system and/or the commencement of baseflow. Implementation of the other features of the LORP will commence upon certification of the LORP EIR.	The Draft EIR stated that the baseflow would not commence on June 13, 2003. The Final EIR was completed in June 2004 per the February 13, 2004 Stipulation and Order. Phase I releases started December 6, 2006. Phase II releases of 40 cfs were physically achieved in February 2007 and were certified by the court in July 2007. Additional punitive conditions involving maintaining flows and recording of flows were added to the 2007 Stipulation and Order following certification of the 40 cfs base flows.	Complete.
I. Permits, Approvals, Licenses	The Parties will work cooperatively with DWP and/or the County in obtaining, and will support the issuance of, any permits, approvals, licenses, or agreements which are required by law and/or are necessary for the implementation of the LORP.	Permits were received from the following agencies to facilitate implementation of the LORP: State Water Resources control Board, California Department of Fish and Game, California State Lands Commission, US Army Corps. of Engineers, Caltrans, and the Bureau of Land Management.	Complete.

1997 MOU, SECTION III - ADDITIONAL COMMITMENTS					
	A. Studies, Evaluations, and Commitments	1. Yellow-Billed Cuckoo Habitat	Under the direction of LADWP and the County, Ecosystem Sciences will evaluate Yellow-billed Cuckoo habitat in riparian woodland areas of Hogback and Baker Creeks. Based on the evaluation, if deemed warranted, habitat enhancement plans for these areas will be developed by Ecosystem Sciences, in consultation with LADWP, the lessee for the area and the parties to the 1997 MOU. The evaluations were to be completed within 36 months of the discharge of the writ, but the deadline has been extended by the 1997 MOU Parties. Actions or projects recommended by this evaluation will be presented to the Board of Water and Power Commissioners for approval and implementation. If approved by the Board of Water and Power Commissioners, habitat enhancement plans will be implemented as expeditiously as feasible.	Ecosystem Sciences completed a Yellow-billed Cuckoo (YBC) Habitat Plan in April 2005. LADWP released a Draft EIR in January 2006. The 1997 MOU Parties and others expressed displeasure with the Consultant's project. The MOU Parties and the lessees for the Baker Creek and Hogback Creek areas entered into negotiations with LADWP staff to develop another alternative for the YBC Habitat Plan. The *Ad Hoc Yellow-billed Cuckoo Habitat Enhancement Plan* was completed and a Mitigated Negative Declaration was released for public review in 2010. The Board of Water and Power Commissioners approved the project on January 19, 2010. Required initial plantings and replacement plantings have been fully implemented on schedule per the plan. Additional replacement plantings will be pursued where necessary to achieve project goals by 2016-2018.	Implemented in full. Success criteria not yet met. Monitoring is ongoing and replanting occurs as necessary to reach project goals.

1997 MOU, SECTION III - ADDITIONAL COMMITMENTS					
	A. Studies, Evaluations, and Commitments	2. Inventories of Plants and Animals at Springs and Seeps (LORP Planning Area)	Within 36 months of the discharge of the writ, an inventory of plants and animals at wetlands associated with springs and seeps was to be conducted by Ecosystem Sciences.	The deadline for completion of the inventories was extended to December 2000 and then to July 2001 by the MOU Parties. No further extensions have been granted. Ecosystem Sciences completed and submitted results of its inventory to the MOU Parties in June 2001.	Complete.
		3. Additional Mitigation	A total of 1600 AF of water per year will be supplied by LADWP for the implementation of the on-site mitigation measure at Hines Springs and on-site or off-site mitigation identified in the 1991 EIR for impacts at Fish Springs, Big and Little Seely Springs and Big and Little Blackrock Springs. Under the direction of LADWP and the County, Ecosystem Sciences will recommend reasonable and feasible on-site and/or off-site mitigation measures, including the implementation of mitigation at Hines Springs. Projects recommended by these studies and evaluations will be presented to the Board of Water and Power Commissioners for approval and implementation. The mitigation measures are to be implemented by LADWP and maintained by LADWP and/or the County. The measures were to be implemented within 36 months of the discharge of the writ.	The Second Amendment of Amended Stipulation and Order (Case No. S1CVCV01- 29768) regarding the Additional Mitigation Projects Developed by the MOU Ad Hoc Group was executed on March 8, 2010 by Inyo County Superior Court. This Amendment accepts the Additional Mitigation Projects as mitigation for the 1600 AF provision and establishes a two year timeline for implementation of the projects. The Additional Mitigation Projects were approved by the Board of Water and Power Commissioners following CEQA evaluation in June 2010. LADWP began implementing the eight projects shortly thereafter and all projects were implemented by the March 8, 2012 court deadline.	Implemented and ongoing; currently attaining goals. Monitoring is ongoing.

1997 MOU, SECTION III - ADDITIONAL COMMITMENTS			
B. Owens Valley Management Plans	LADWP, in consultation with the parties to the 1997 MOU and others, is to identify areas of City-owned land, which are not included in the LORP planning area, and develop plans for the identified areas to remedy problems caused by livestock grazing and other uses of the land. Priority will be given to riparian areas, irrigated meadows and sensitive plant and animal habitats. The plans will provide for the continuation of sustainable uses (including recreation, livestock grazing, agriculture, and other activities) will promote biodiversity and a healthy ecosystem, and will consider the enhancement of threatened and endangered species habitats. LADWP, working with Ecosystem Sciences, will commence the planning effort within 5 years, and plans are to be completed within approximately 10 years. Each plan will contain an implementation schedule and will be implemented in compliance with CEQA. As plans become final, they will be presented to the Board of Water and Power Commissioners for approval and implementation.	LADWP has completed the Owens Valley Land Management Plan (OVLMP) which describes management actions for City-owned lands in Inyo County per the MOU. A Mitigated Negative Declaration was prepared and circulated in 2010 and was adopted by the Board of Water and Power Commissioners in June 2010. Implementation of fencing and recreational management measures were completed in early 2011. City lands outside the LORP Planning Area are currently being managed under this plan. LADWP is finalizing a Habitat Conservation Plan for City lands in Inyo and Mono Counties. this plan is near complete.	Implemented and ongoing. Monitoring is ongoing.
C. Inventory of Plants and Animals at Springs and Seeps (outside LORP Planning Area)	Within 36 months of the discharge of the writ, an inventory of plants and animals at wetlands associated with springs and seeps was to be conducted jointly by LADWP and the County on lands owned by the City of Los Angeles within the portion of the Owens River watershed located in Inyo County that is not included in the LORP Planning Area.	LADWP has completed data collection for spring and seep discharge. LADWP had Ecosystem Sciences completed the inventory of plants and animals.	Complete.

1997 MOU, SECTION III - ADDITIONAL COMMITMENTS			
D. Type E Vegetation	By December 1999, LADWP and the County are to develop baseline conditions for management of vegetation classified as Type E in the long-term agreement. These conditions will be adopted by the Standing Committee.	The inventory of Type E Vegetation was conducted by Resource Concepts, Inc. (RCI) under a contract administered by Inyo County and funded by LADWP. The final report on the inventory was complete in December 1999.	Complete.
E. Aerial Photo Analysis	By June 2000, LADWP, the County, and experts in aerial photography interpretation were to conduct a study analyzing existing air photos of the Owens Valley to evaluate the merits of using air photos in monitoring vegetation in the valley, to determine the feasibility of using air photos to analyze and refine the vegetation map data base, and to provide recommendations on how aerial photography, or other remote sensing techniques, could be used to monitor vegetation conditions and changes. If feasible and cost-effective relative to other field monitoring techniques, recommendations will be implemented.	The deadline was extended by the 1997 MOU Parties. In January 2002, Ecosat Geobotanical Surveys, Inc., the consultant conducting the study, completed reports addressing the 1997 MOU requirements.	Complete.

1997 MOU, SECTION III - ADDITIONAL COMMITMENTS			
F. Mitigation Plans for Impacts Identified in the 1991 EIR and the Water Agreement	The Technical Group will prepare mitigation plans and implementation schedules for all areas for which on-site mitigation measures have been adopted in the 1991 EIR. The plans will be completed by June 1998. In accordance with the EIR, on-site mitigation will be accomplished through revegetation with native Owens Valley species and through establishment of irrigation.	In August 1999, following the receipt of comments from the MOU Parties, the Inyo/Los Angeles Technical Group approved the Revegetation Plan for Impacts Identified in the LADWP, Inyo County EIR for Groundwater Management (1999), also known as the Mitigation Plan. In January 2002, the County identified four on-site mitigation measures for which plans were inadvertently omitted from the mitigation plan. The County prepared draft plans and schedules for these measures. Mitigation plans were submitted by LADWP to ICWD for the Independence Eastside Regreening and Big Pine Northeast Regreening projects and evaluations of East of Shepherd Creek Alfalfa Potential E/M and East of Big Pine Potential E/M projects on August 13, 2004.	Mitigation Plan complete. Implementation and operation of these projects is ongoing. See Revegetation Table for more information.

1997 MOU, SECTION III - ADDITIONAL COMMITMENTS			
G. Technical Group Meetings	Technical Group meetings are to be open to the public.	Scheduled Technical Group meetings were opened to the public beginning October 15, 1997.	Ongoing.
H. Annual Report on the Owens Valley and I. Reports	LADWP and the County are to prepare annual reports describing environmental conditions in the Owens Valley, and describing studies, projects and activities conducted under the long-term agreement and the MOU. The report will be released on or about May 1 of each year.	Inyo County has prepared annual reports since 1991. LADWP has released annual reports for 2001 through 2014.	Ongoing.
SECTION IV - FISH SLOUGH			
Fish Slough	The Parties acknowledge that LADWP and CDFG have reached agreement concerning threatened and endangered species that involves land management and other activities in the Fish Slough area of Mono County. The agreement is to be memorialized in a letter from LADWP to CDFG.	A letter agreement was never memorialized; however, LADWP has worked closely with CDFG on the Fish Slough Area of Critical Environmental Concern (ACEC) for many years.	Ongoing.

SECTION VI - DISPUTE RESOLUTION			
Dispute Resolution and Litigation	The parties to the 1997 MOU will maintain frequent, informal communications to minimize disagreements. In the event of a dispute among the parties over the 1997 MOU the parties will meet and confer before any litigation concerning the dispute may be commenced. The parties may elect to retain the services of a mutually acceptable impartial mediator/facilitator to assist in dispute resolution. Any litigation arising out of the 1997 MOU is to be commenced in the Inyo County Superior Court.	The parties to the 1997 MOU, called the "MOU Signatory Group," have met regularly on an as needed basis. In addition, the Parties and their attorneys met several times during the fall/winter of 2003-04 to develop the 2004 Stipulation and Order. Due to conditions beyond LADWP's control, the 2004 Stipulation and Order schedule for putting water in the LORP could not be met. The MOU Parties filed suit in the Inyo County Superior Court on July 25, 2005. The Court ordered limited pumping, required groundwater recharge, no reduction of in-valley uses, a fine, and implementation of LORP base flows by July 25, 2007. The Court also stayed an injunction against the use of the second aqueduct if base flows were not achieved in the LORP. Upon achieving base flows prior to July 25, 2007 the injunction and daily fines were dismissed.	Ongoing.
SECTION VI -FINANCIAL PROVISIONS			
Financial Assistance	The County will pay the sum of $53,000 to the Sierra Club and the sum of $30,000 to the Owens Valley Committee for professional services in the development and preparation of the 1997 MOU.	The specified amounts have been paid by the County to the identified parties.	Complete.
** Sections not listed in this table do not have specified projects or requirements of LADWP*			

7.1. Yellow-billed Cuckoo Annual Report: Progress of Habitat Enhancement **at Baker and Hogback Creeks**

The *Final Ad Hoc Yellow-billed Cuckoo Habitat Enhancement Plan* (Enhancement Plan) states in Section 2.1.8.3:

> *"Annual reports will be prepared each year by LADWP to summarize the progress of the willow and cottonwood planting and black locust control. The annual reports will include a brief introduction to include the performance standards, monitoring methodologies, monitoring results for the year, and discussion of any adjustments required to achieve the overall goal to improve the habitat."*

<u>Fences</u>

All fencing required by the Enhancement Plan has been completed as of 2011.

<u>Baker Creek Planting</u>

All planting areas within Baker Creek have received their initial plantings and replacement pole plantings based on the first growing season monitoring.

<u>Replanting at Baker Creek</u>

Planting Areas C, E, F&G, and H, while not required by the plan, were replanted in March 2014 (Figure 7.1). They were replanted to try and achieve the target canopy cover goals by the sixth year following the initial planting. Some pole plantings were planted outside of the planting areas and will not be included in the total cover values. If they survive, they will add to the suitable habitat for the Yellow-billed Cuckoo.

- A total of 45 pole plantings were planted in Area C, of which, 16 of the poles were cottonwoods and 29 were willows (Figure 7.2).

- A total of 260 pole plantings were planted in Area E. Willows accounted for 175 of the pole plantings and cottonwoods accounted for 85 pole plantings (Figure 7.3).

- In Area F&G a total of 130 pole plantings were planted. Willows accounted for 68 of the pole plantings and cottonwoods accounted for 62 pole plantings (Figure 7.4).

- A total of 60 pole plantings were planted in Area H, of which, 27 were cottonwoods and 33 were willows (Figure 7.5).

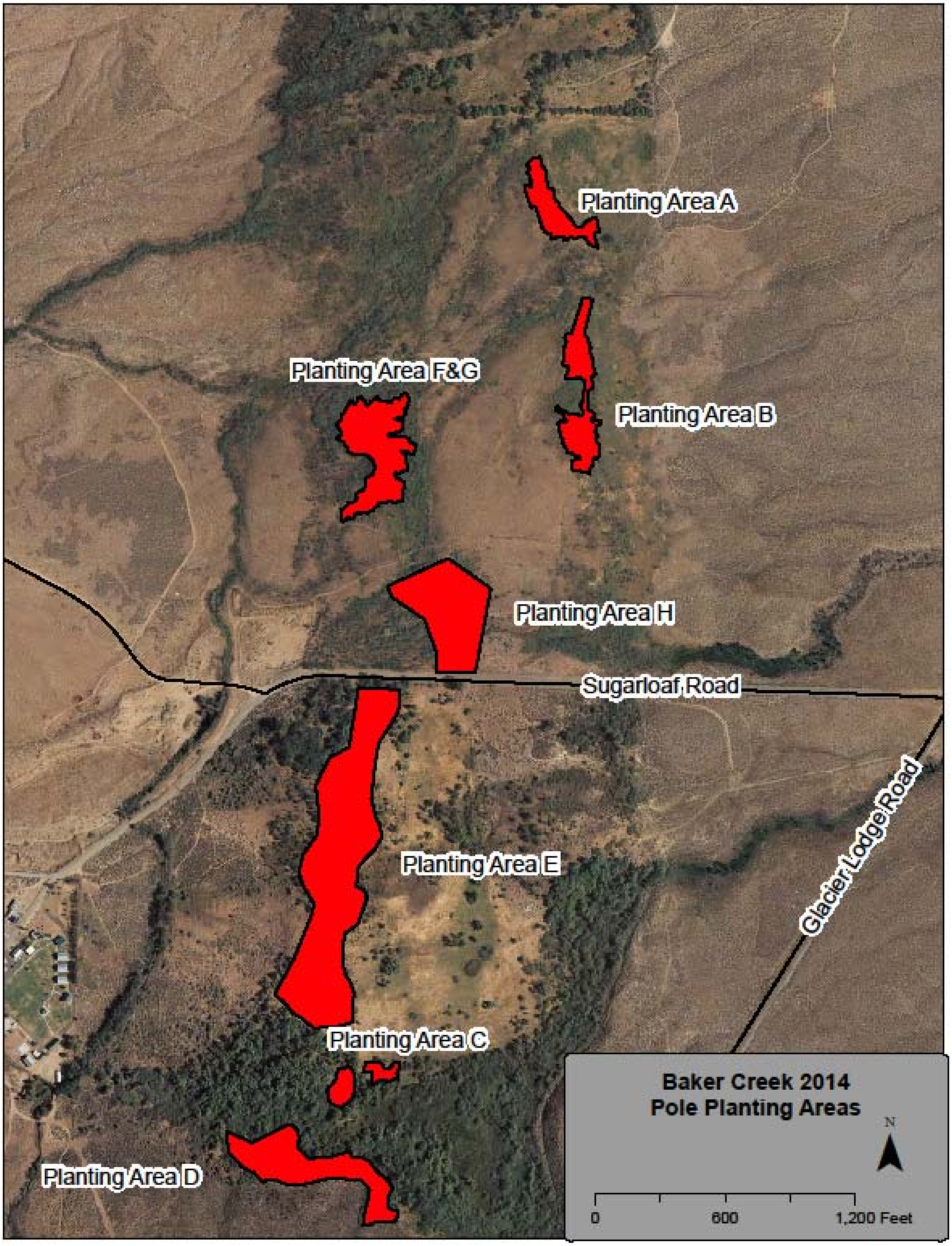


Figure 7. 1 Overview of pole planting areas in the Baker Creek watershed.

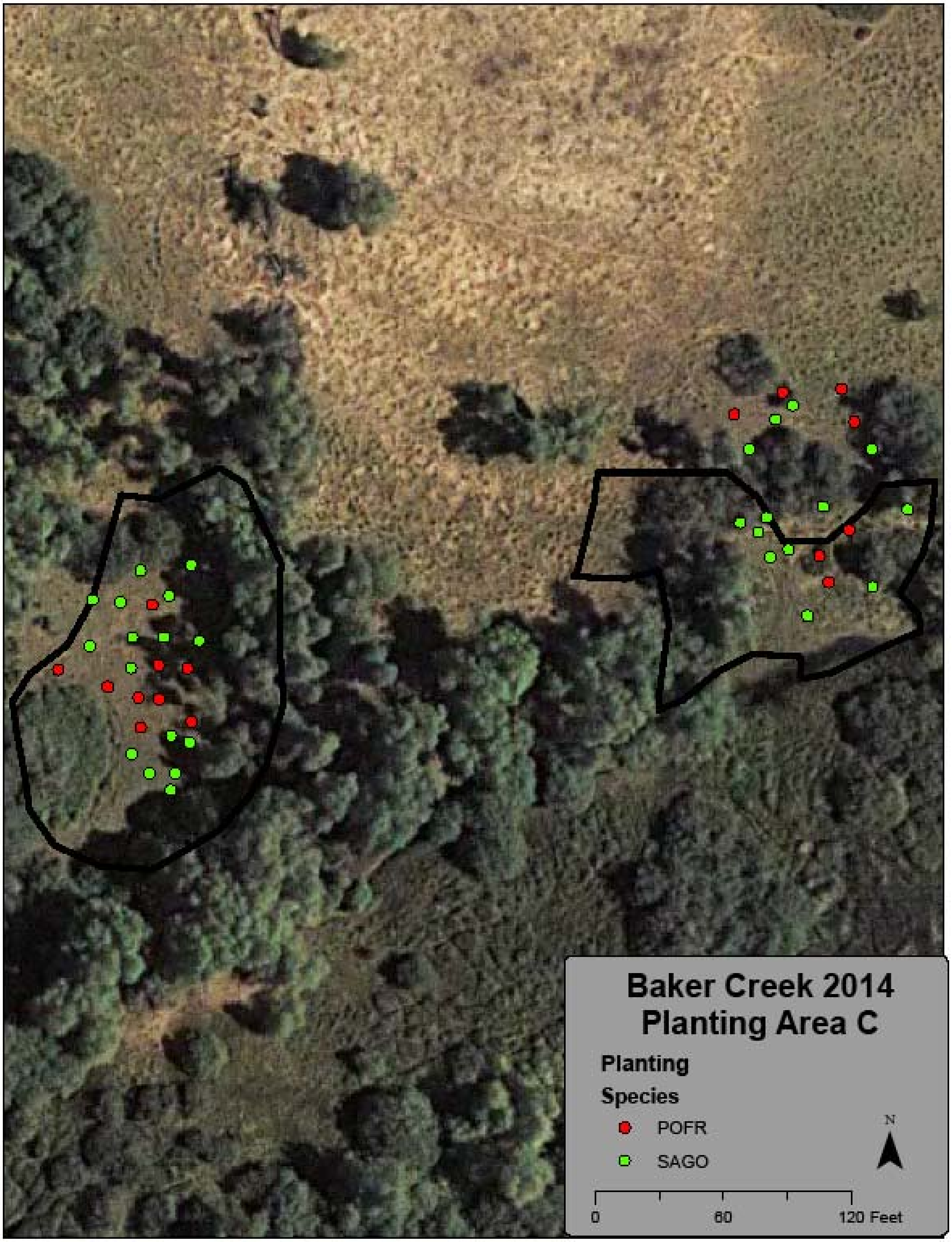


Figure 7. 2 Overview of replanting by species in planting area C.

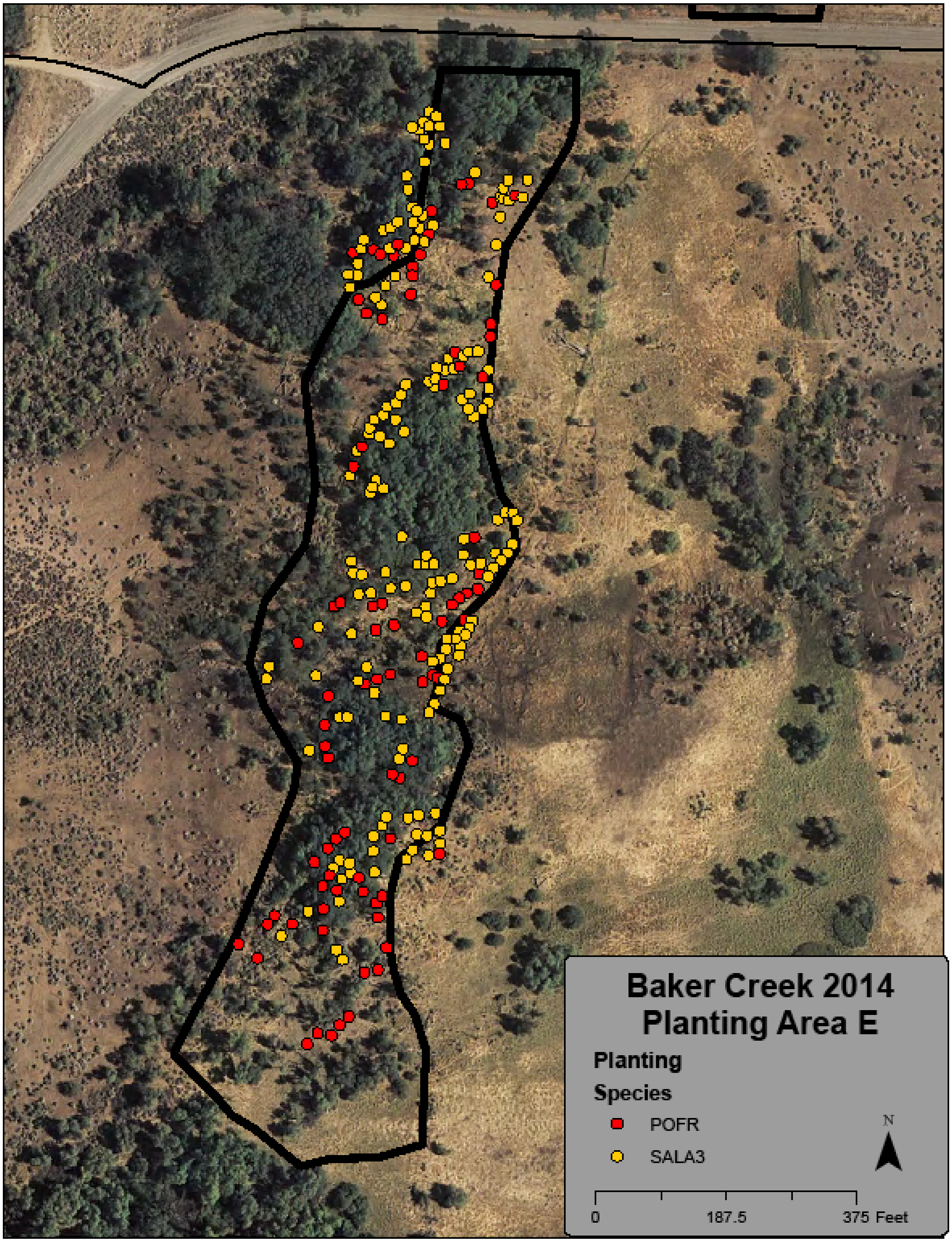


Figure 7. 3 Overview of replanting by species in planting area E.

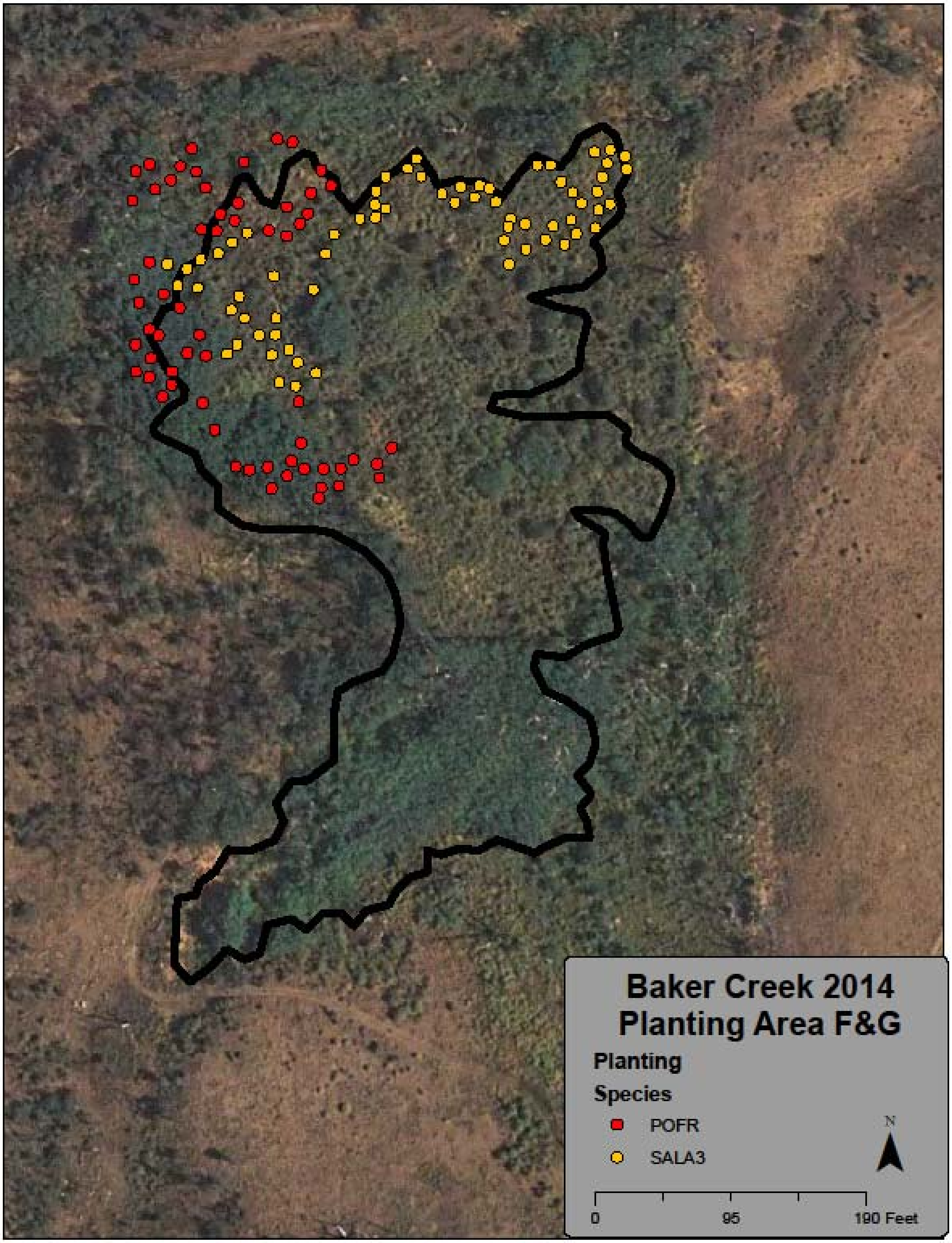


Figure 7. 4 Overview of replanting by species in planting area F&G.

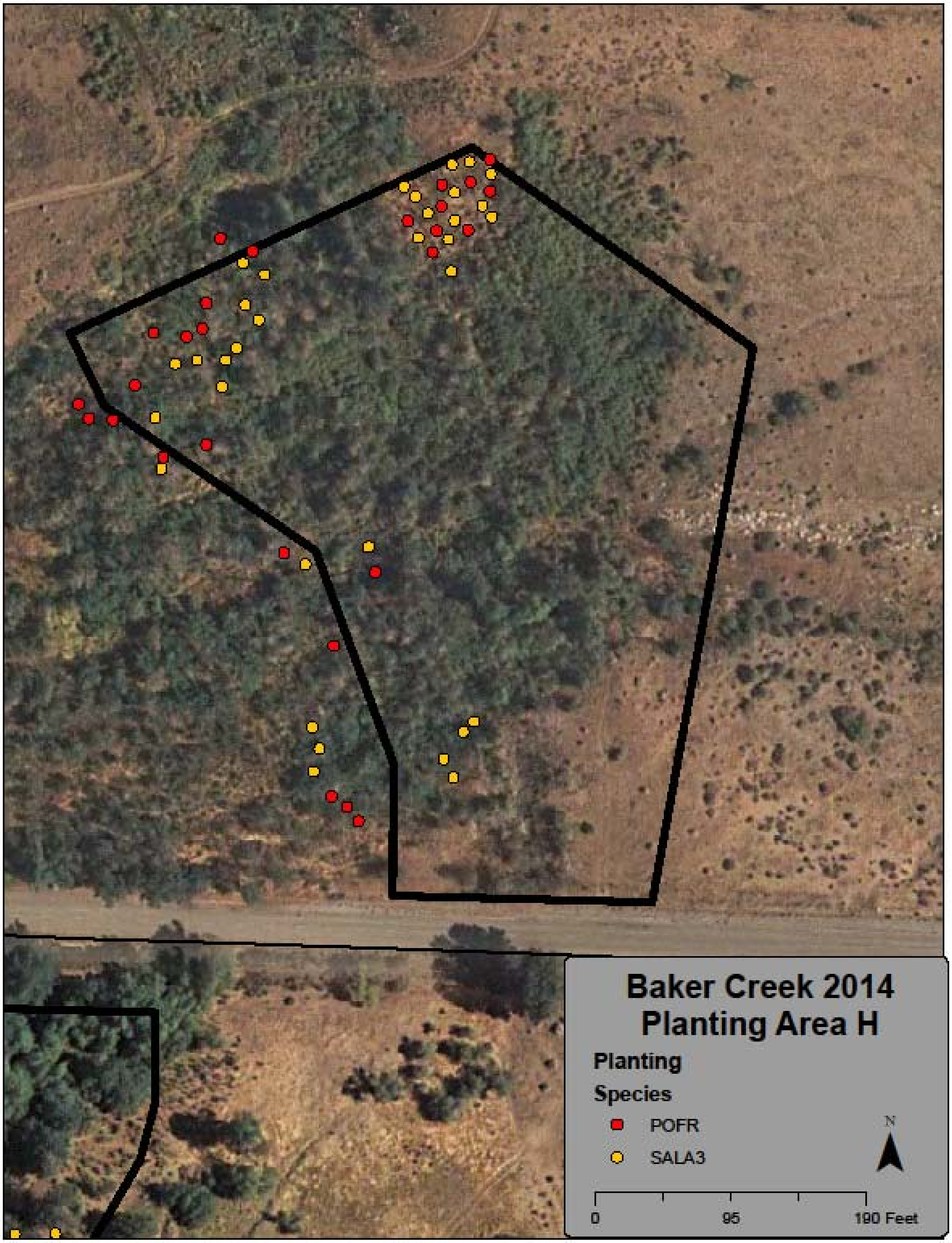


Figure 7. 5 Overview of replanting by species in planting area H.

As-Built Plans

All pole plantings in 2014 were noted by species and given an individual identifying number. The pole plantings were documented and located with a GPS and downloaded into GIS. As-Built Plans were displayed over a 2009 aerial photo. The As-Built Plans were provided to the MOU Parties and the lessee in May 2014.

Non-native Species Control

Black Locust (*Robinia pseudoacacia*)

This year black locust control was conducted throughout all of the Baker Creek planting areas. Locust control this year consisted of treating resprouts from previous treatments. LADWP crews used chainsaws and loppers to remove the locust resprouts and the cut stumps were immediately sprayed with herbicide.

Canada Thistle (*Cirsium arvense*)

In an effort to control the spread and hopefully eradicate Canada thistle in area C, LADWP crews used herbicide to treat the area during the month of September 2014. The area will be reassessed in 2015 and treated again if necessary.

Planting Area Monitoring

Section 2.1.8.1. of the Enhancement Plan states:

> *"Quantitative monitoring will assess the attainment of final success criteria and identify the need to implement contingency measures in the event of failure. Monitoring will begin in late summer after the second growing season since initial planting to capture the fullest extent of the growing season and after the majority of avian species have finished breeding. Monitoring will continue annually through Year 6 within each planting area or until the success criteria are met."*

Planting criteria as stated in section 2.1.7.1 of the Enhancement Plan reads:

> *Planting areas A, B, C, D, E, and F – Cover of target upper and mid canopy species is at least 50 percent.*
>
> *Planting areas G and H - Cover of target upper and mid canopy species is equal to 65 percent.*
>
> *Native species understory cover will be at least 50 percent in all planting areas.*
>
> *Black locust cover will be no more than five percent in all the planting areas.*
>
> *Cover of other non-native species in the understory will be less than 25 percent in all planting areas.*

Transects and bearings were randomly located using GIS for each of the planting areas. A total of six transects were generated for area A, eight transects for area B, three transects for area C, 10 transects for area D, 28 transects for area E, 10 transects for area F & G, and 12 transects for area H. Transects within these areas were sampled from July 23-30, 2014. This year was the fourth year that line point sampling was conducted for planting areas A, B, F & G, the third year for planting areas C, D, and H, and the second year for planting area E. Using line point data, absolute cover values were then calculated for each planting area and are summarized in Table 7.1.

Table 7. 1 Percent Absolute Cover Values for 2011-2014 within Planting Areas A, B, C, D, E, F & G, and H

		Planting Area A	Planting Area B	Planting Area C	Planting Area D	Planting Area E	Criteria for Areas A,B,C,D	Planting Area F&G	Planting Area H	Criteria for Area F&G, H
Upper Canopy Native	2011	T	1	-	-	-		4	-	
	2012	T	T	3	T	-		3	7	
	2013	0	T	10	3	7		9	8	
	2014	0	1	3	2	8		7	4	
Upper Canopy Non-Native	2011	0*	0*	-	-	-	<5	1*	-	<5
	2012	0*	0*	0*	0*	-		3*	1*	
	2013	0*	0*	0*	0*	6		1*	T*	
	2014	0*	0*	0*	0*	5		T*	T*	
Mid Canopy	2011	51	25	-	-	-		23	-	
	2012	62	17	10	45	-		30	35	
	2013	48	27	16	49	8		34	37	
	2014	64	40	18	56	8		30	46	
Upper & Mid Canopy	2011	51*	27	-	-	-	≥50	26	-	≥65
	2012	62*	17	13	45	-		33	42	
	2013	48	27	26	52*	15		43	45	
	2014	64*	41	20	58*	17		37	50	
Understory Native	2011	37	64*	-	-	-	≥50	53*	-	≥50
	2012	30	67*	69*	35	-		39	42	
	2013	27	52*	37	22	21		33	34	
	2014	22	44	60*	24	17		39	28	
Understory Non-Native	2011	1*	7*	-	-	-	<25	12*	-	<25
	2012	T*	10*	13*	3*	-		7*	6*	
	2013	3*	9*	32	T*	7*		8*	9*	
	2014	3*	8*	24*	2*	2*		4*	7*	

In 2014, upper and mid canopy cover in planting area A was 64%, which was 16% higher than the 2013 cover value, 2% higher than 2012 and 13% higher than the 2011 cover value. Area A has met the enhancement plan criterion in 2011, 2012, and 2014. Native understory cover values decreased for the fourth straight year, from a high of 37% in 2011 to a low of 22% in 2014. Native understory has yet to meet the enhancement plan criterion of ≥50%. Both the non-native canopy cover and understory cover values have met the enhancement plan's criteria.

The upper and mid canopy cover of Planting area B increased from the 2013 cover value of 27% to 41% in 2014. The 2014 cover value of 41% was 24% higher than the 2012 value of 17%, and 14% higher than the 2011 value. Area B has yet to meet the upper and mid canopy criterion of ≥50% in any year. Native understory cover values decreased from 52% in 2013 to 44% in 2014. For the first time post implementation, this area has not met the native understory cover criterion. Both the non-native canopy cover and understory cover values have met the enhancement plan's criteria.

Upper and mid canopy cover decreased in Area C from the 2013 value of 26% to the 2014 cover value of 20%. Area C has yet to meet the upper and mid canopy criterion of ≥50% in any year. Native understory increased from 37% in 2013 to 60% in 2014. The area has once again met the native understory criterion of 50%. While non-native canopy cover remained at 0% in 2013, non-native understory cover decreased from 32% in 2013 to 24% in 2014 and was just below the enhancement plan's criteria of 25%.

Area D increased from 52% in 2013 to 58% in 2014 for upper and mid canopy cover. At 58% upper and mid canopy cover in area D met the criterion stated in the enhancement plan. Area D has also met the criterion of non-native canopy cover with 0% cover. Native understory increased by 2% from the 2013 cover value of 22% to 24% in 2014 and was still below the 50% criterion. Non-native understory cover values in 2014 increased from a trace to 2% in 2014, which was still well below the 25% criterion value stated in the plan.

Area E had an upper and mid canopy cover value of 17% in 2014, an increase of 2% from the 2013 value. Non-native canopy cover for 2014 is right at the 5% criterion value stated in the plan. Native understory cover value in 2014 is 17% which is 33% below the target cover value specified in the plan and 4% lower than the 2013 cover value. Non-native understory cover in 2014 was 2% which is well below the 25% criterion.

In 2014, Area F & G had an upper and mid canopy cover value of 37%, a decrease of 6% from the 2013 cover value and was still below the plan's 65% criterion. Non-native canopy cover value in 2014 is just a trace and is well below the criterion. The 2014 native understory cover value is 39%, a 6% increase from the 2013 value and the same as the 2012 value. Non-native understory in 2014 decreased 4% from the 2013 cover value of 8% and is below the plan's criterion.

Area H had a 5% increase in upper and mid canopy cover in 2014 from the 2013 value of 45%. Non-native canopy cover remained the same as 2013 at a trace. Native understory decreased for a third straight year to 28% in 2014. Again, shading is the most likely cause for this reduction in understory cover and should continue to decrease as the canopy matures. Non-native understory cover has decreased from the 9% in 2013 to 7% in 2014.

Limiting Factors

Drought

The area is experiencing its fourth consecutive dry year. This four-year drought is causing the depth to groundwater to increase and is potentially lowering it below the rooting zone of the pole plantings and native understory.

Depth to Groundwater

Due to two consecutive dry years, in 2013, LADWP conducted a depth-to-groundwater analysis in five of the seven planting areas to determine if ground water levels in the planting areas were suitable for the replanting of poles. Based on that analysis it was determined that ground water levels were unsuitable for pole planting in areas A and B due to most augured holes having a depth to groundwater of more than six feet (Figure 7.6).

Following a third consecutive dry year, LADWP repeated this ground water analysis in 2014 (Figure 7.7). Based on this analysis it was determined that groundwater levels dropped in all five of the areas tested and that all five of the planting areas were unsuitable for replanting in 2015. Therefore, no replanting efforts are planned in 2015 until conditions improve.

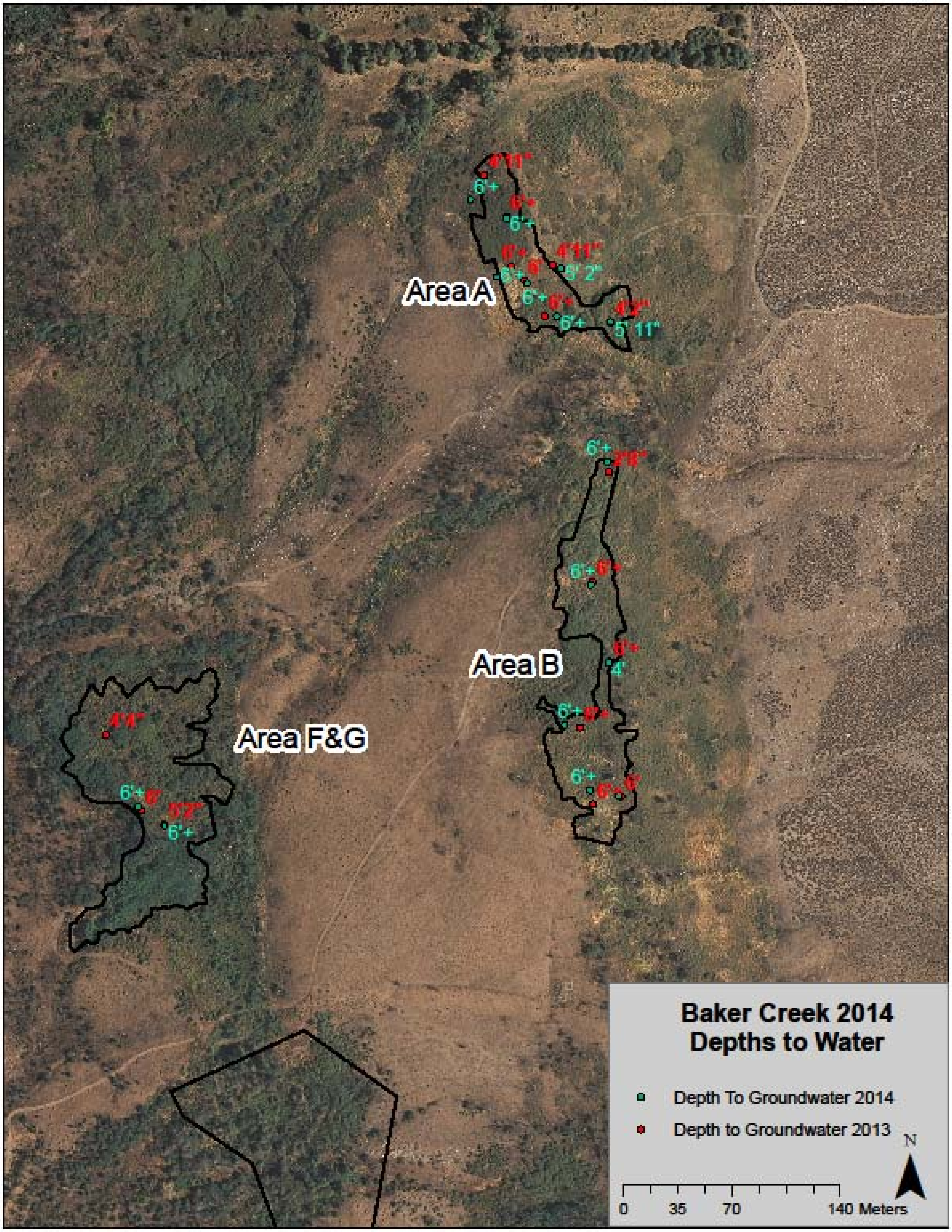


Figure 7. 6 Depths to groundwater in planting areas A, B, and F&G for 2013 and 2014.

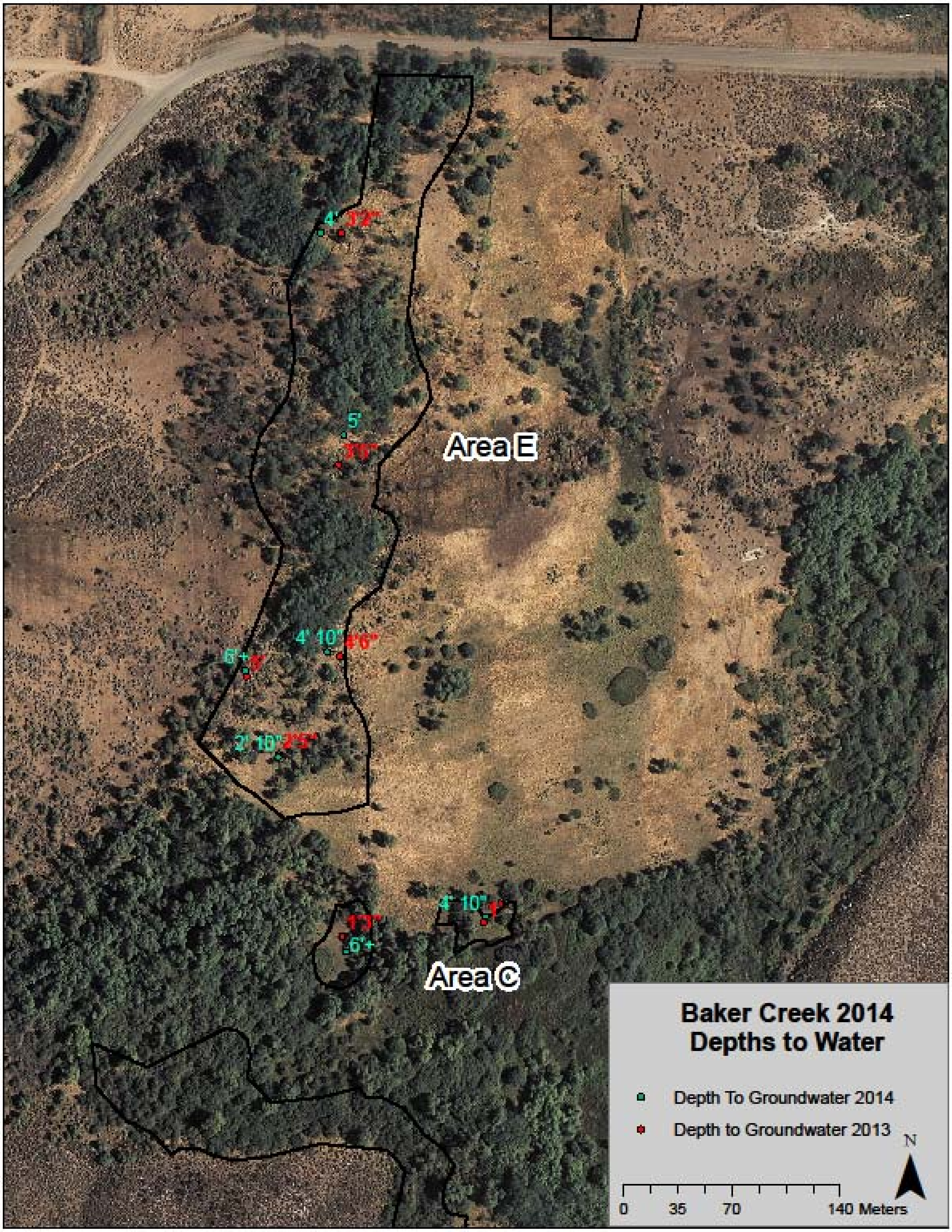


Figure 7. 7 Depths to groundwater in planting areas C and E for 2013 and 2014.

Competition

As stated in previous years' reports, shading by the upper and mid canopy could lead to a decrease in understory cover values. Competition for nutrients and water could also explain the decreases in ground cover.

Activities Scheduled for 2015

Non-native Species Control

Black locust control will continue in planting areas E, F & G, and H during the winter of 2015-2016 to control re-sprouts if needed. Thistle control in and around planting area C will continue if needed using herbicide.

Depth to Groundwater

Repeat groundwater analysis to determine if groundwater levels are suitable for pole plantings in 2016.

Planting of Pole Cuttings

If groundwater levels are suitable for pole plantings, cuttings will be harvested during the winter and planted when conditions permit in the spring of 2016. No planting efforts are scheduled during 2015 due to current groundwater depths below the rooting zone due to drought conditions.

7.2. Additional Mitigation Projects Developed by the MOU Ad Hoc Group

7.2.1. Introduction

Section III.A.3. Additional Mitigation of the 1997 MOU describes LADWP's commitment to supply 1,600 acre feet (AF) of water per year for 1) the implementation of the on-site mitigation measure at Hines Spring identified in the 1991 EIR, and 2) the implementation of on and/or off-site mitigation in addition to that identified in the 1991 EIR for impacts that occurred at Fish Springs, Big and Little Blackrock Springs, and Big and Little Seely Springs. The Second Amendment of Amended Stipulation and Order Case No. S1CVCV01-29768 was executed on March 8, 2010, by the Superior Court of California, Inyo County. This order accepts the eight projects described in the *Additional Mitigation Projects Developed by the MOU Ad Hoc Group* (Additional Mitigation Projects) document as mitigation for impacts identified above and establishes a two year timeline for their implementation. The projects are named according to their locations: Freeman Creek, Warren Lake, Hines Spring Well 355, Hines Spring Aberdeen Ditch, North of Mazourka Canyon Road, Homestead, Well 368, and Diaz Lake.

7.2.2. CEQA Process for the Additional Mitigation Projects

In accordance with CEQA, LADWP completed an Initial Study for the Additional Mitigation Projects and prepared a Mitigated Negative Declaration (MND). The document was released for review March 23- April 26, 2010. After review of the comments received and based on the information in the Initial Study, LADWP determined that with adoption of mitigation measures, implementation of the Additional Mitigation Projects would not have a significant impact on the environment. The final MND, Mitigation Monitoring and Reporting Program, and proposed implementation schedule were approved by the City of Los Angeles Board of Water and Power Commissioners (Board) on June 1, 2010. A Notice of Determination was filed with the Inyo County Clerk on June 2, 2010. LADWP began implementing the projects shortly thereafter and implemented all eight Additional Mitigation Projects by March 8, 2012 as specified in the Stipulation and Order.

7.2.3. Monitoring and Reporting per the Additional Mitigation Projects Document

The Additional Mitigation Projects document defines a five-year monitoring framework for the projects that includes flow monitoring, rapid assessment surveys, photopoint monitoring, and mapping requirements. Table 7.2 shows flow data recorded for each of the Additional Mitigation Projects from April 1, 2014, through March 31, 2015. Additionally, on July 17, 21 and 22, 2014 LADWP conducted photo point monitoring, woody recruitment surveys and assessment of fence condition (where applicable) and has generated recommendations for the projects where necessary.

Table 7. 2 Additional Mitigation Projects Developed by the MOU Ad Hoc Group, Annual Accounting in Acre Feet (April 1, 2014-March 31, 2015).

Additional Mitigation Projects Developed by the MOU Ad Hoc Group
Annual Accounting in Acre Feet (April 1, 2014-March 31, 2015)

2013-2014	Freeman Creek (*Average**) (2054)	Warren Lake (2173)	Hines Well 355 (W355)	Aberdeen Ditch (400)	North of Mazourka (F418)	North of Mazourka (404)	Homestead T775 (F421)	Homestead Well (F419)	Well 368 (F420)	Diaz Lake (86)	Total
April	20	0	13	0	9	8	6	18	11	0	85
May	19	0	19	0	9	8	6	19	11	0	91
June	14	0	18	0	8	8	6	18	10	34	116
July	13	0	19	0	9	8	6	18	11	74	157
August	10	0	18	0	9	8	7	12	10	0	74
September	13	0	18	1	7	3	6	13	10	0	71
October	22	65	19	12	7	2	6	18	10	141	302
November	22	181	18	11	7	2	6	18	10	0	275
December	23	29	18	10	7	3	7	19	11	0	125
January	23	0	17	11	7	3	7	18	10	0	96
February	18	0	16	10	6	2	6	16	9	0	84
March	18	50	13	8	7	2	7	13	10	0	127
Total					*91*	*56*	*75*	*199*			**1604**
Project Total	*215*	*325*	*207*	*64*	*147*		*274*		*124*	*248*	
Annual Target AF	*215**	*0*	*240*	*145*	*300*		*300*		*150*	*250*	***1600***
Monthly Target AF	*18*	*0*	*20*	*12*	*25*		*25*		*13*		*133*

**Freeman Creek will be recorded as 215 AF/year based on long term average regardless of varying flow reads.*

***Amount in excess of project allotment may not be carried over to future years.*

The Additional Mitigation Projects monitoring framework also defines that the California Department of Fish and Wildlife (CDFW) will annually survey for spring/seep obligates for five years post-implementation and recommend measures to improve spring/seep obligates at each project location. Timing of these surveys is at CDFW's discretion. To date, no data has been submitted to LADWP.

Inyo County Water Department (ICWD) conducted rapid assessment surveys defined by the Additional Mitigation Projects during the peak of the growing season. The flooded and vegetated extent of each project was mapped in July 8-10, 2014 with the exception of Warren Lake, which was mapped March 13, 2015. The Diaz Lake project has a continued water supply for an existing project and no changes in vegetation were expected. Therefore, no map was completed for that project.

Data collection, map units, and the list of species were similar to procedures developed in the initial mapping effort in 2013. ICWD mapped the wetted extent for each project by walking 1 meter outside of the wetted perimeter using a Garmin GPS map 76CSx GPS unit in NAD83. After downloading raw line files, polygons of the wetted areas were digitized in ArcGIS, and a one meter buffer was added. Vegetation was mapped within a liberal area surrounding the wetted perimeter because there are no fixed boundaries for each Mitigation Project. Polygons of similar vegetation cover and composition were delineated based on visible boundaries between vegetation types identified in the field. General habitat types were mapped as: wetland (based on vegetation community only; not necessarily jurisdictional), meadow, shrub meadow, phreatophytic shrub, xeric scrub, and miscellaneous areas noted as barren and disturbed. Acreages of general habitat types were extracted from ArcGIS polygons to compare changes within each project from 2013-2014 and are depicted in Table 7.3.

Each general habitat type was subdivided further into vegetation types where differences in composition could be delineated in the field. This additional detail may be beneficial for tracking the evolution of specific plant populations following project implementation. However, for the purpose of this report, only general habitat types have been mapped for the vegetated extent of each project. Therefore, some polygons depicted within each of the general habitat types are representative of sub-habitat types. The species lists and composition for each of these sub-habitat types for each project are listed in Section 7 Appendix 1.

Species for each project in Section 7 Appendix 1 are listed by sub-habitat types in order of dominance. Meadow vegetation types ranged from areas dominated by grasses with few shrubs or woody species to shrub meadows with a relatively high proportion of shrub or woody species, similar to units defined in the Green Book. Scrub habitats were composed of more than 80% of shrub species. The phreatophytic habitats are dominated by woody riparian species. Wetland habitats include open water, standing vegetation in ponded areas, and areas dominated by a variety of marsh species.

Meadow:

- Alkali Meadow - meadow with a low proportion of shrub species and a mixture of meadow species. No particular grass or forb species was predominant. This category was subdivided where possible into the categories below.
    - Alkali Meadow, flooded – seasonally wet meadow with no shrubs and a mixture of meadow species
    - Alkali Meadow, sparse - open meadow with a low proportion of shrub species and a mixture of meadow species. Cover below approximately 20%
    - Alkali Meadow with dead shrubs - meadow with diverse mix of standing dead shrubs
    - Saltgrass Meadow - nearly a monoculture of saltgrass along with minor amounts of other meadow species
        - Saltgrass Meadow with dead shrubs - nearly a monoculture of saltgrass with dead standing shrubs
        - Saltgrass/Rush Meadow - meadow with a high proportion of saltgrass and rushes
    - Alkali Sacaton Meadow, sparse - nearly a monoculture of sparse alkali sacaton
    - Anemopsis Meadow - meadow with a high proportion of *Anemopsis californica*,
    - Weedy Alkali Meadow - meadow with a high proportion of weedy species
    - Glycyrhiza Meadow - meadow with a high proportion of *Glycyrhiza*
- Rush/Sedge Meadow - meadow with a high proportion of rushes & sedges
- Wild Rye Meadow - meadow with a high proportion of creeping wild rye and some weedy species

Shrub Meadow: areas of shrubs with a grass understory

- Alkali Meadow with shrubs - alkali meadow with equal proportions of grasses and a mixture of greasewood, rabbitbrush, and Nevada saltbush
- Rabbitbrush Meadow - meadow with a high proportion of rabbitbrush
    - Dead Rabbitbrush Meadow - meadow with a high proportion of dead standing rabbitbrush
    - Dry Rabbitbrush Meadow - open meadow with a high proportion of rabbitbrush (Warren Lake only)
- Greasewood Meadow - meadow with a high proportion of greasewood
- Nevada Saltbush Meadow - meadow with a high proportion of Nevada saltbush
- Sagebrush Meadow - meadow with a high proportion of sagebrush
- Willow/Saltgrass/Alkali Sacaton - meadow consisting of coyote willow, saltgrass & alkali sacaton with few other species

Xeric Scrub: areas of shrubs with little grass

- Blackbrush Scrub - shrub habitat with a high proportion of blackbrush
- Dalea Scrub - Nearly a monoculture of dotted dalea
- Four-winged Saltbush Scrub - Shrub habitat with a high proportion of four-winged saltbush
- Greasewood Scrub - Shrub habitat with a high proportion of greasewood
    - Greasewood/Shadscale Scrub - shrub habitat with an equal proportion of greasewood and shadscale
- Shadscale Scrub - shrub habitat with a high proportion of Shadscale
- Mojave Mixed Scrub - Mojave shrub habitat with approximately equal proportions of species
- Cottonwood/Sagebrush - open habitat with equal proportions of cottonwood & sagebrush interspersed with other species
- Sagebrush Scrub - shrub habitat with a high proportion of sagebrush along with other xeric adapted species and few annual species where water has been spread
- Sagebrush & Weeds - disturbed sagebrush scrub with many exotic and native weeds
- Mixed Xeric Scrub - shrub habitat with several species of shrubs adapted to very deep water tables, few grasses

Phreatophytic Shrub Habitat:

- Allenrolfia Scrub - shrub habitat with a high proportion of *Allenrolfia*
- Cottonwood Tree – patch or individual *Populus fremontii*
- Cottonwood, Willow & Mesquite - woodland of mixed tree species
- Desert Olive - patch or individual *Forestiera pubescens*
- Greasewood Scrub - Shrub habitat with a high proportion of greasewood
    - Greasewood/Parry Saltbush Scrub - shrub habitat with an equal proportion of greasewood and Parry saltbush
- Nevada Saltbush Scrub - shrub habitat with a high proportion of Nevada saltbush. Other groundwater dependent shrubs also present.
- Parry Saltbush Scrub - shrub dominated habitat with a high proportion of Parry saltbush
- Rabbitbrush Scrub - shrub dominated habitat with a high proportion of rabbitbrush. Other groundwater dependent shrubs also present.
- Riparian Woodland - woodland habitat adjacent to creek with a high proportion of woody riparian species along with riparian forbs and graminoides
- Rose Patch - stand of *Rosa woodsii*
- Screwbean Mesquite – stand of *Prosopis pubescens*
- Willow Tree - individuals or patch of tree willows
- Willow Tree & Desert Olive - mix of tree willow species and desert olive
- Willow Scrub – stand of willow
- Wash – variety of groundwater dependent species ranging from woody riparian to annuals

Wetland Habitat:

- Pond - open water
- Dried Pond - pond bottom with species from adjacent habitats
- Bullrush - wetland habitat with a dominant proportion of Bullrush
- Phragmites - wetland habitat with a dominant proportion of *Phragmites*
- Cattail - wetland habitat with a high proportion of cattail species
    - Cattail, dry - wetland habitat with a high proportion of cattail species without ponded water
- Ditch - wet conveyance with various wetland adapted species
    - Dry Ditch - formerly used conveyance with species similar to adjacent habitats and some wetland species
- Tule/Cattail - wetland habitat with a mix of tule and cattail species
    - Tule/Cattail, dry - wetland habitat with mix of tule and cattail species, but with no ponded water
- Tule/Cattail/Saltgrass – transition between wetland and saltgrass meadow

Miscellaneous areas: Disturbed or Barren where noted

- Alkali Heliotrope Stand - previously disturbed area dominated by alkali heliotrope
- Barren - previously impacted area with little or no perennial vegetation, few species and in very low numbers
- Berm – previously constructed berm with sparse vegetation
- Cleared – unvegetated. Vegetation removed apparently for slash disposal in the Freeman creek project.
- Dead - dead standing vegetation on flooded edge of south ponds at the Homestead project
- Dead Bassia – stand of dead bassia, unvegetated
- Disturbed – construction disturbance that has sparse vegetation
- Feed Supplement Site - unvegetated
- Fence Clearing - disturbed area cleared for installation of fences; species composition similar to adjacent habitat
- Old saltcedar, cut – areas of cut tamarisk with a mixture of species at the Homestead project
- Playa – unvegetated
- Pullout/Staging Area – unvegetated vehicle parking area
- Road - unvegetated
- Slash Pile - unvegetated
- Weeds – patch of live exotic and native weeds in a disturbed area.

Table 7. 3 Additional Mitigation Projects General Habitat Type Comparison in Acres

	Freeman Creek		Warren Lake		Hines Spring & Aberdeen	
	2013	2014	2013	2014	2013	2014
Wetted extent	0.48	1.08	133.49	150.73	1.24	1.77
Wetland	1.84	1.84	0.16	0.16	1.84	1.81
Phreatophytic Shrub	9.4	9.48	12.43	12.43	15.58	15.71
Meadow	5.13	5.13	208.68	204.26	14.1	14.08
Shrub Meadow	9.83	9.78	132.54	127.9	69.01	68.88
Xeric Scrub	160.37	180.74	9.34	9.9	2.07	2.36
Barren	0	0	43.48	48.7	0	0.022
Disturbed	10.26	10.81	2.27	2.27	8.33	8.14

	North of Mazourka		Homestead Site		Well 368	
	2013	2014	2013	2014	2013	2014
Wetted extent	2.62	9.4	9.53	10.68	1.15	1.45
Wetland	6.72	4.9	9.23	9.72	0.78	0.77
Phreatophytic Shrub	4.66	5.46	24.13	24.19	6.15	4.7
Meadow	24.55	26.15	54.86	63.02	1.01	0.96
Shrub Meadow	68.86	69	76.13	72.45	0	0.22
Xeric Scrub	0	0	20.17	23.48	11.68	12.96
Barren	0.15	0.11	2.08	1.24	0.06	0.06
Disturbed	1.21	1.09	12.74	13.39	0.81	0.82

General habitat types did not fluctuate significantly from 2013-2014, with the exception of a few habitat types amongst Freeman Creek, North of Mazourka, and the Homestead sites. The southeastern section of Freeman Creek was added to 2014 survey, which explains the increase of 20 acres of xeric scrub from 2013-2014. During the 2014 growing season at the North of Mazourka site, there was a noticeable increase in saturation around the outflow area of the artesian wells, which contributed to an increase in the acreage of wetted extent within the project area. The northwestern edge of Homestead was added to the 2014 survey, which explains the increase of meadow habitat. The wetted extent of Warren Lake increased due to an increase in the makeup of flows to achieve the required 1600 AF annual water allotment to the projects.

7.2.4. Freeman Creek

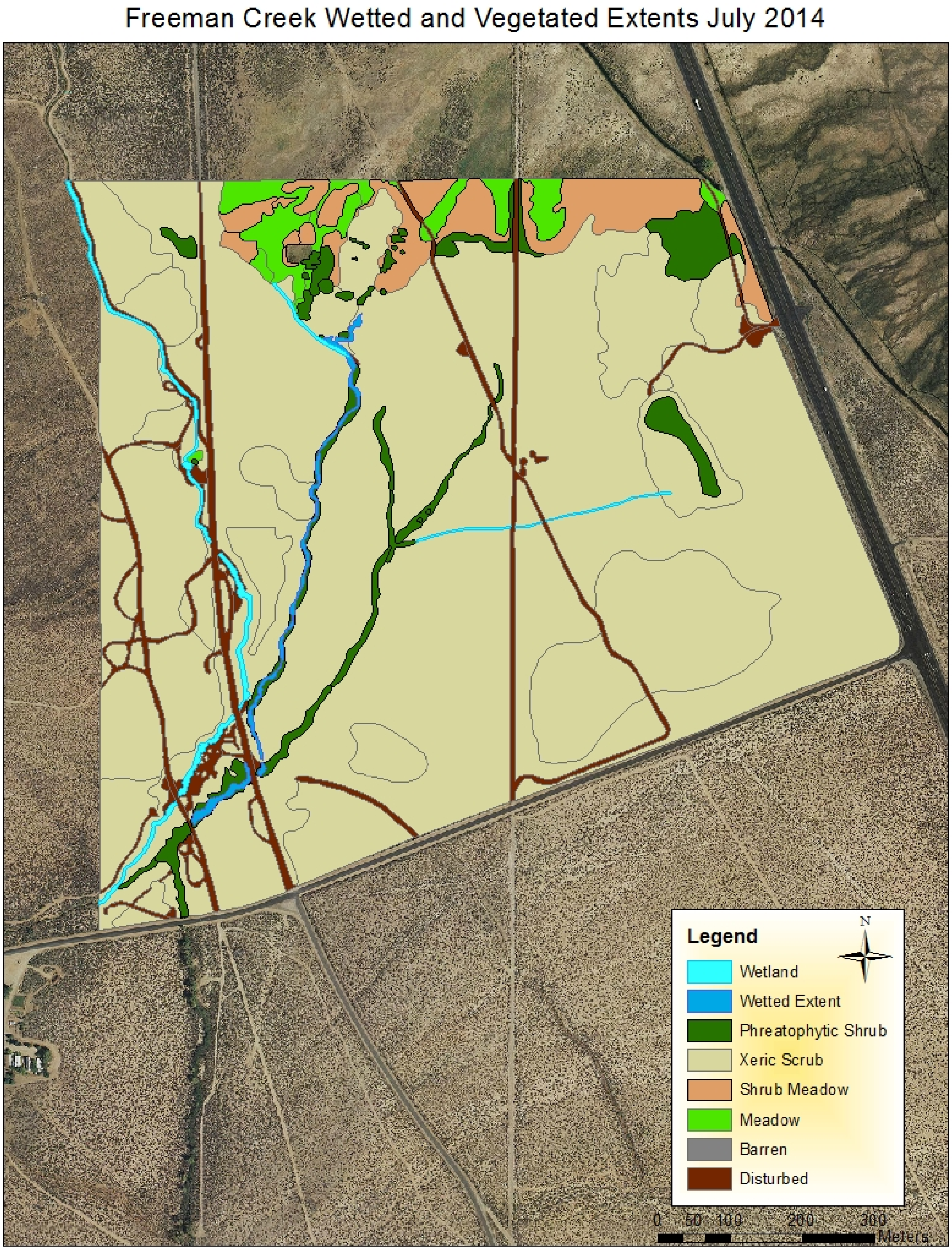


Figure 7. 8 Freeman Creek Wetted and Vegetated Extents July 2014

Flow Monitoring

The annual water allotment for this project is 215 AF/year, which was based on long term averages for Freeman Creek. This year, LADWP recorded 206 AF of water being used for the project during the 2014-2015 water year.

Photo Point Monitoring

Photo points were established in April 2011 and were recaptured at the peak of the growing seasons in 2012-2014. These photos can be made available upon request.

Woody Recruitment

Three saltcedar plants (*Tamarix ramosissima)* were observed along the upper reach of dry wash two. Along dry wash one, three Fremont cottonwood (*Populus fremontii*) and 11 Red willow (*Salix laevigata)* seedlings from 2013 are healthy and steadily growing, ranging from 1.5-3 feet tall. Additionally, new seedlings are emerging along the wash, including nine Fremont cottonwood, 19 Red willow and one Narrowleaf willow (*Salix exigua*). Fourteen Fremont cottonwood and 29 Red willow seedlings observed in 2013 in dry wash two are alive and healthy, ranging from 2-4 feet tall. Additional seedling recruitment was also noted including five Fremont cottonwoods and four Red willows. Some of these seedlings were captured in new photo points in 2013 so that survivability can continue to be assessed in the future.

Freeman Creek Dry Wash Two depicting healthy willow and cottonwood recruitment, July 2014.

In 2013, some Narrowleaf willows along the culvert and powerline road appeared to be stressed, possibly by a fungus, canker or similar type of disease. However, in 2014 these willows exhibited less dark spotting along their leaf margins and appeared healthy overall. New willow growth is occurring throughout the area.

Along Freeman Creek there is a short reach of nine Red willows that died back in 2013. The cause of this die-back is unknown; however, in 2014, new healthy sprouts have emerged out of the trunks of five individuals (refer to photos below).

Freeman Creek willow die-back showing new emerging sprouts July, 2014

Fence Condition

Not applicable.

Recommendations

Due to another extreme below average water year, flows were lower than long term averages for Freeman creek. LADWP installed a new data logger at the flume to automate data collection and monitor the volume of water that is going to the project.

No additional planting or seeding is necessary at this time, as recruitment of desirable species is naturally occurring. Monitoring for saltcedar seedlings and resprouts will continue and will be removed from the project site as resources are available.

7.2.5. Warren Lake

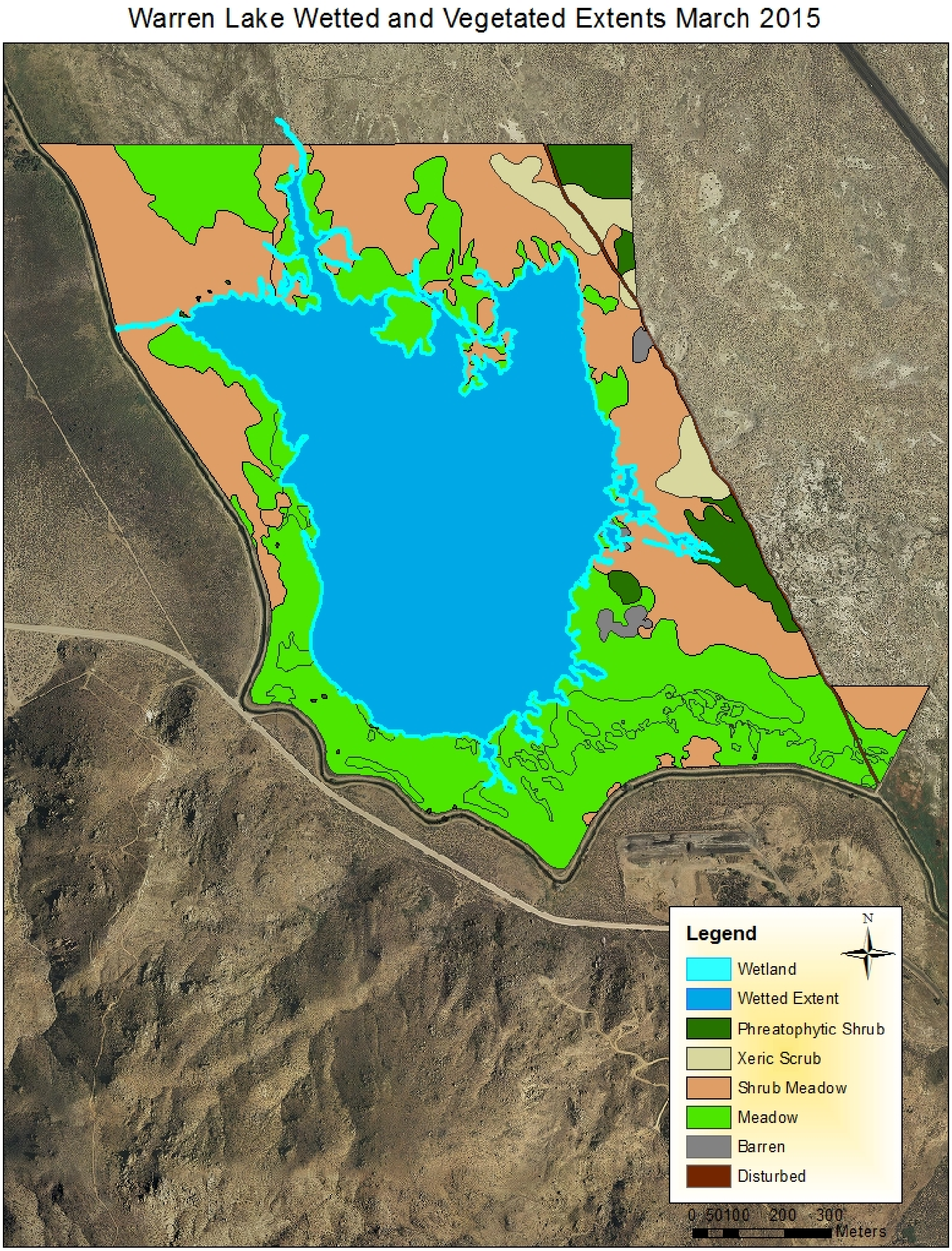


Figure 7. 9 Warren Lake Wetted and Vegetated Extent March 2015

Flow Monitoring

LADWP released water to Warren Lake from October through December 2014 and February through March 2015 to fulfill the remaining balance of the 1600 AF water commitment. The total volume of water that was released to the project was 325 AF. The wetted extent of Warren Lake increased compared to the 2013 water year due to an increase in the makeup of flows to achieve the required 1600 AF annual water allotment to the projects. However, it should be noted that the wetted extent varies in the fall versus the spring due to the varying amount of water supplied to the project during each month.

Photo Point Monitoring

Photo points were established in April 2011 and were recaptured at the peak of the growing seasons in 2012-2014. These photos can be made available upon request. One old cottonwood at the "Warren Canal South" photo point location has fallen and was cleared to the north side of the road (see photos below).

Warren Lake, July 2014

"Warren Canal South" photo point depicting fallen cottonwood, July 2014

Woody Recruitment

There are three Fremont cottonwood saplings along the floodplain of Warren Lake west from the canal that were identified in 2012. These trees remain healthy, are vigorously growing and are, on average, 10 feet tall.

Fence Condition

Not applicable.

Recommendations

The project is operating as necessary. The check wall structure constructed in the Big Pine canal in February 2014 has improved the facilitation of flows into Warren Lake and has reduced the erosion along the banks of the canal caused by the old concrete blocks.

Saltcedar was not observed in July 2014. However, a small patch of pepperweed (*Lepidium latifolium*) has established on the east bank of the canal, approximately one mile down the canal from Reynolds Road. This saltcedar will be sprayed as resources are available in 2015.

7.2.6. Hines Spring Well 355

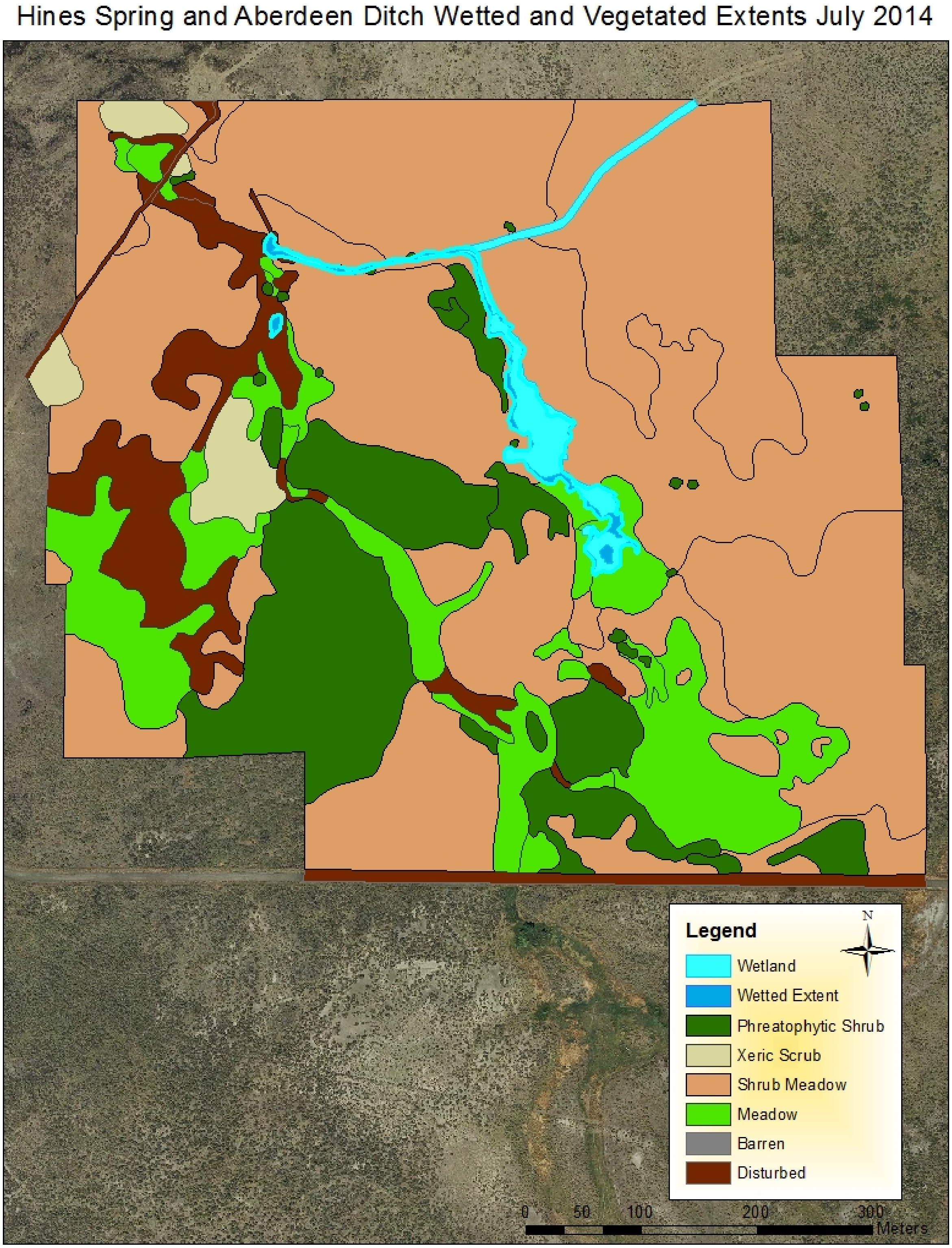


Figure 7. 10 Hines Spring and Aberdeen Ditch Wetted and Vegetated Extents July 2014

Flow Monitoring

The annual water allotment for this Hines Spring Well 355 Project is 240 AF/year. LADWP released 207 AF to this project during the 2014-2015 water year.

Photo Point Monitoring

Photo points were established in March 2012 and were recaptured at the peak of the growing seasons in 2012-2014. These photos can be made available upon request.

The flooded extent of this area varies greatly from winter to summer based on rates of evapotranspiration. Fivehorn smotherweed (*Bassia hyssopifolia*) and Russian thistle *(salsola tragus)* have encroached around the pipe outfall, and are particularly abundant to the north. Cattails (*Typha latifolia)* are being grazed by horses and mules in the main spring channel, which has improved water flow heading to the southern end of the project but encroachment of cattails progresses annually and has increased in the ponded areas.

Multiple berms have been constructed between the large red willow and the pipe outfall to attempt to direct flows around the tree to reduce ponding and ensure the trees survival. Most constructed berms failed; however, the most recent construction of packed rock and earthen berm in late summer of 2014 appears to have been successful, with minimal seepage through the barrier to the south (see photo below).

Hines Well 355 depicting berm to the left near pipe outflow and red willow, March 2015.

Woody Recruitment

There are three red willow seedlings established near the pipe outfall. Additionally, there are two more red willow seedlings growing on the west side of the ponded area. There is also abundant recruitment of desirable non-woody species throughout the project area. The main spring channel banks below the pipe outfall is exhibiting healthy and vigorous growth of Alkali sacaton (*Sporobolus airoides*), Saltgrass (*Distichlis spicata*), Salt heliotrope (*Heliotropium curassavicum)*, Beardless wildrye (*Leymus triticoides),* Rabbit-foot grass *(Polypogon monspeliensis)* and Showy milkweed *(Asclepias speciosa)* (see photo below)*.*

Hines Well 355 main spring channel below pipe outfall, July 2014

Additionally, Baltic rush (*Juncus balticus),* Bulrush (*schoenoplectus spp*.) and Monkey flower *(mimulus guttatus)* are healthy and abundant in the spring channel and ponded areas (see photo below).

Hines Well 355 ponded area depicting desirable non-woody vegetation growth, July 2014.

Fence Condition

The fence around Well 355 is in good condition. To satisfy conditions under the Additional Mitigation Projects document, LADWP constructed a fence around the Hines Well 355 and Aberdeen Ditch Projects in March 2014. A fence exclosure was constructed around a ponded portion of Hines Spring that will exclude horse grazing but will allow elk and deer passage (see Figure 7.11 and photos below). The fence exclosure was designed with three corner braces, two H-braces and a cowboy gate and runs approximately 1,110 feet in length. There are four wire strands including a smooth top wire to allow safe passage for elk and deer.

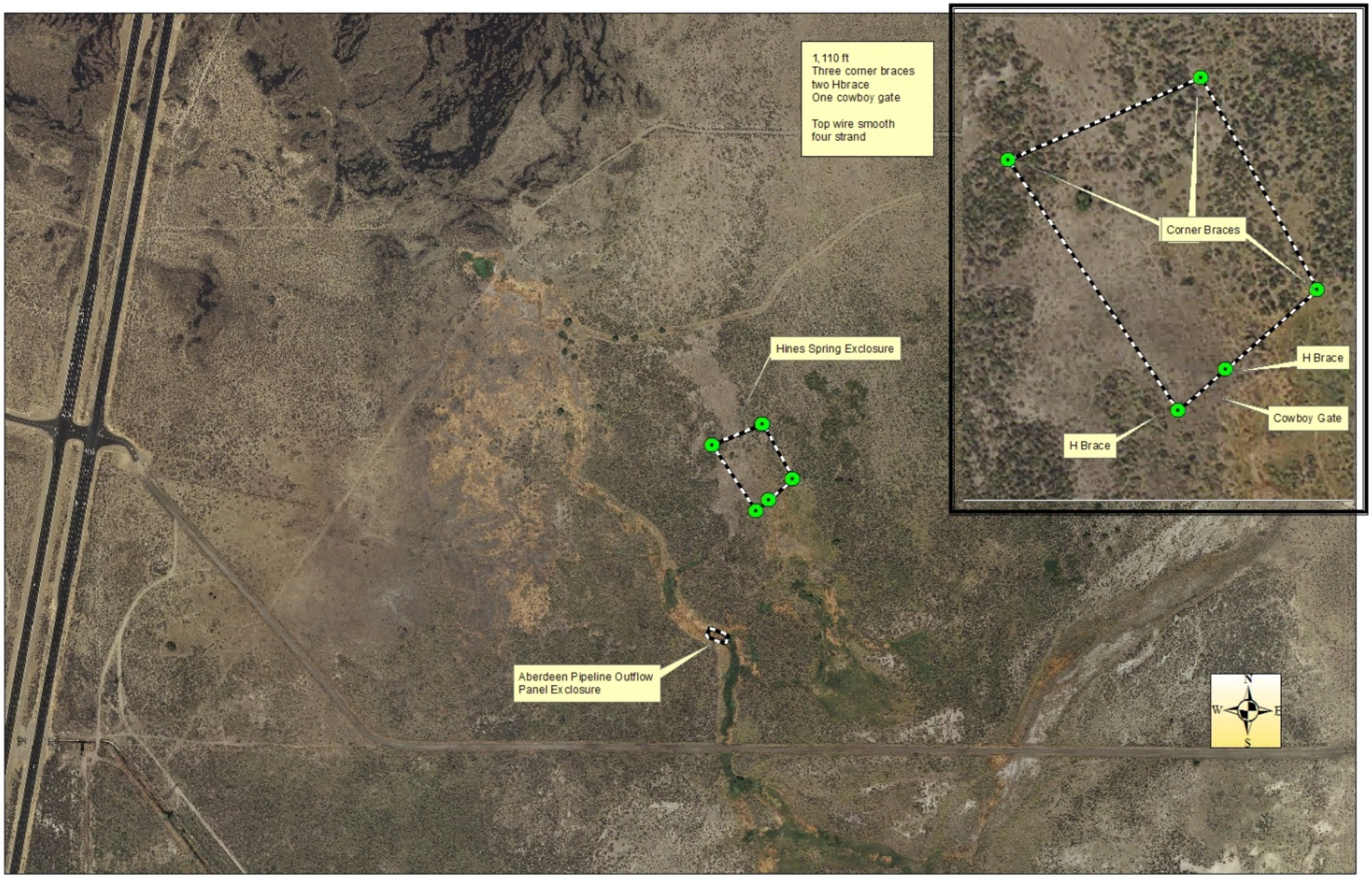


Figure 7. 11 Hines Well 355 and Aberdeen Ditch fence exclosure locations, March 2014

Hines Well 355 fence exclosure around ponded area looking north, July 2014

Hines Well 355 fence exclosure around ponded area looking southeast, March 2015.

Recommendations

No additional planting or seeding is necessary at this time, as recruitment of desirable species is vigorous, healthy, and diverse at the project site (particularly non-woody species). The main spring channel downstream of the pipe outfall was redirected around the large red willow located directly south of the outfall via a rock and earthen berm. This berm will be monitored to ensure survival of the willow. The new fenced exclosure will be monitored to examine the potential effects of domestic grazing in response to vegetation recruitment inside and outside of the exclosure. Monitoring will also examine whether comparative grazing effects occur by ungulates such as elk and deer utilizing the area when domestic grazing pressures are absent.

7.2.7. Aberdeen Ditch Project

Refer to Hines Spring map above for wetted and vegetated extent

Flow Monitoring

The annual water allotment for this project is 145 AF/year. Due to consecutive drought years and competing uses of this limited surface water, LADWP was only able to release 64 AF to this project during the 2014-2015 water year. Water was not released to the Aberdeen Ditch until September 2014 and therefore is not depicted in the Figure 7.11. Water was not released to Aberdeen Ditch during the summer of 2014 due to low flows from consecutive dry years in addition to prior water commitments for fishery flows to the aqueduct in Aberdeen Ditch, and flows to Blackrock fish hatchery. By September 2014, water use at the diversion point was reprioritized, and flows were released to the Aberdeen Ditch Project for the remainder of the water year.

Continuous problems with sinkholes have also occurred. To alleviate this issue, LADWP extended a pipe down the channel into different soil types and locations from 2012-2014 and monitored the pipe outfall, anticipating soil conditions would stabilize for surface water to flow downstream. However, due to a lack of available surface water to supply to the project, the Aberdeen Ditch was dry in July 2014 but resumed again from September 2014 through March 2015 (see photos below). Unfortunately, sinkholes continue to be problematic for this channel.

Aberdeen Channel, July 2014.

Aberdeen Channel extended outfall, March 2015.

Photo Point Monitoring

Photo points were established in March 2011 and were recaptured at the peak of the growing seasons in 2012-2014. These photos can be made available upon request.

Woody Recruitment

Two new Narrowleaf willow seedlings were observed growing along the Aberdeen Ditch intake structure during project monitoring and existing Narrowleaf willows are healthy and growing vigorously. Russian thistle and Fivehorn smotherweed are growing outside of the channel banks and are beginning to encroach in the channel; however, recruitment of desirable non-woody species are establishing throughout the project area, such as American licorice, Monkeyflower, Sedges (*Carex spp.)* and Beardless wildrye. These species are increasing along the Aberdeen Ditch intake structure, filling in prior barren gaps (see photo below).

Aberdeen Intake Structure depicting woody and non-woody species recruitment, July 2014

Fence Condition

To satisfy conditions under the Additional Mitigation Projects document, LADWP constructed a fence around the Hines Well 355 and Aberdeen Ditch Projects in March 2014 (refer to Figure 7.11). Because sink holes continue to be problematic in the spring channel, a small temporary fence exclosure was constructed until a permanent pipe outfall location can be determined to be effective.

Recommendations

Monitoring will continue to determine the effectiveness of the extended pipeline and whether static conditions are attained to construct a permanent fence exclosure for monitoring future grazing effects. LADWP will continue monitoring the establishment of woody recruitment and recruitment of desirable non-woody species.

7.2.8. North of Mazourka Canyon Road

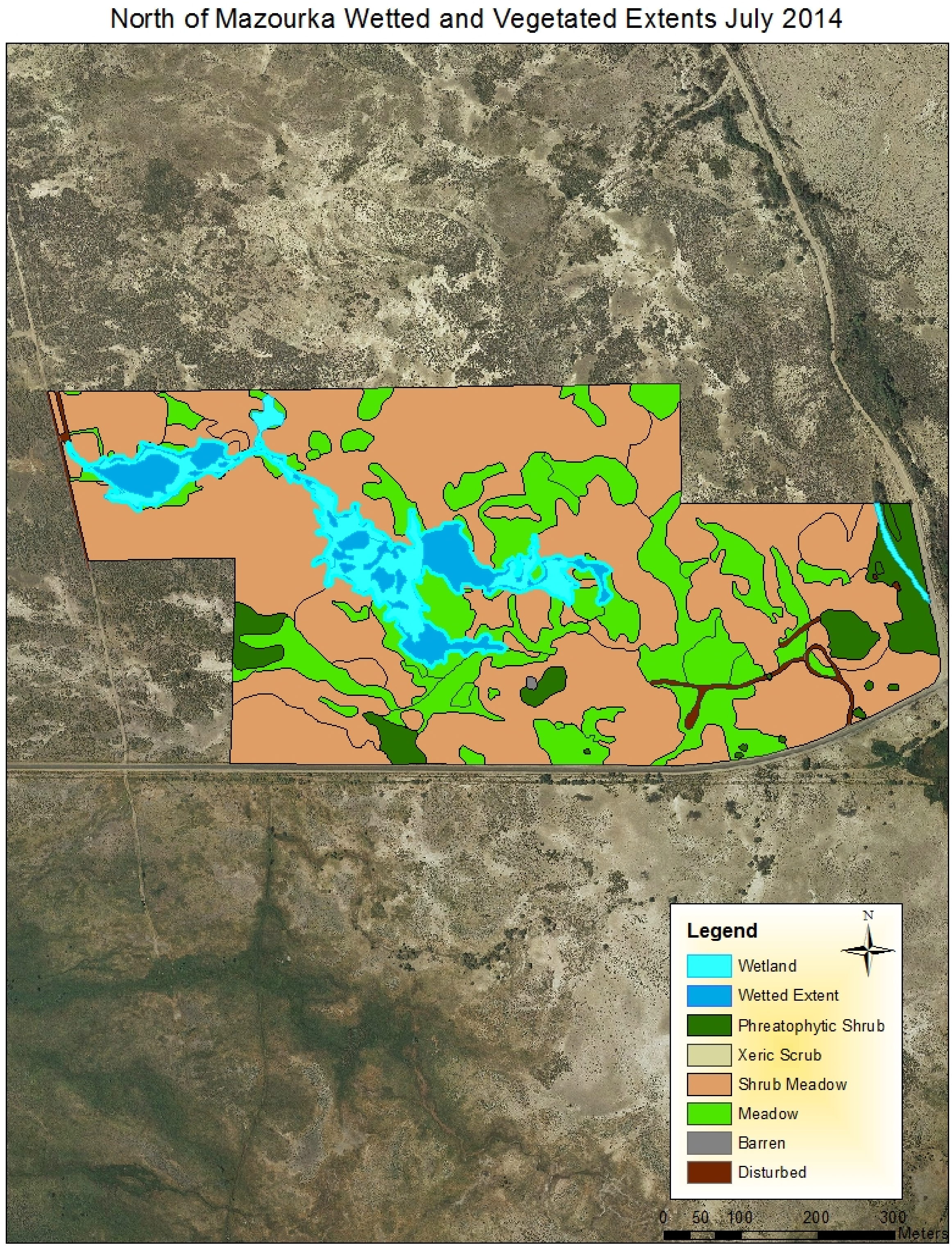


Figure 7. 12 North of Mazourka Wetted and Vegetated Extents July 2014

Flow Monitoring

The annual water allotment for this project is 300 AF/year from two artesian well sources. These wells produced 147 AF during the 2014-2015 water year. This is roughly 1/2 of the anticipated flow, and surface water did not progress as far east this year as it has in previous years. Although more water was released compared to the prior water year, the eastern pond and the “flooded area” photo point was notably less saturated during monitoring. Due to another extreme drought year, it is possible that more water was required to saturate the soil before it could reach the pond and flooded area. However, there was a noticeable increase in saturation around the outflow area of the artesian wells, which contributed to an increase in the acreage of wetted extent within the project area (Table 7.3).

Photo Point Monitoring

Photo points were established in March 2012 and were recaptured at the peak of the growing seasons in 2012-2014. These photos can be made available upon request.

Woody Recruitment

Saltcedar shoots have established and are growing along the ditch of the “flooded area” photo point. There is also one saltcedar that has established approximately 15 feet downstream of the pipe outfall. No new native woody recruitment was noted during 2014 project monitoring. However, there is abundant recruitment of desirable native non-woody species in/near the exclosure and pipe outfall extending east into the project area. Saltgrass and American licorice (*Glycyrrhiza lepidota)* are particularly abundant in this area (see photo below). Some native species, although patchy, are also beginning to establish along the pipeline berm. These include Salt heliotrope, Sacred datura (*Datura wrightii*), and Torrey’s saltbush (*Atriplex torreyi).* Even though this project area is notably drier than last year, woody vegetation and non-woody vegetation remains vigorous.

North of Mazourka pipe outfall, July 2014

Fence Condition

During project implementation, an exclosure was established around the location of water release at the pipe outfall. This fence is currently in good condition.

Recommendations

No additional planting or seeding is necessary at this time, as recruitment of desirable species is naturally occurring, particularly non-woody species in/near the exclosure. Additional saltcedar treatment is needed in areas of resprouts throughout the project area, particularly seedlings in the channel from the prior flooded area to the pond. Eradication will be conducted as resources are available and monitored for resprouts.

7.2.9. Homestead

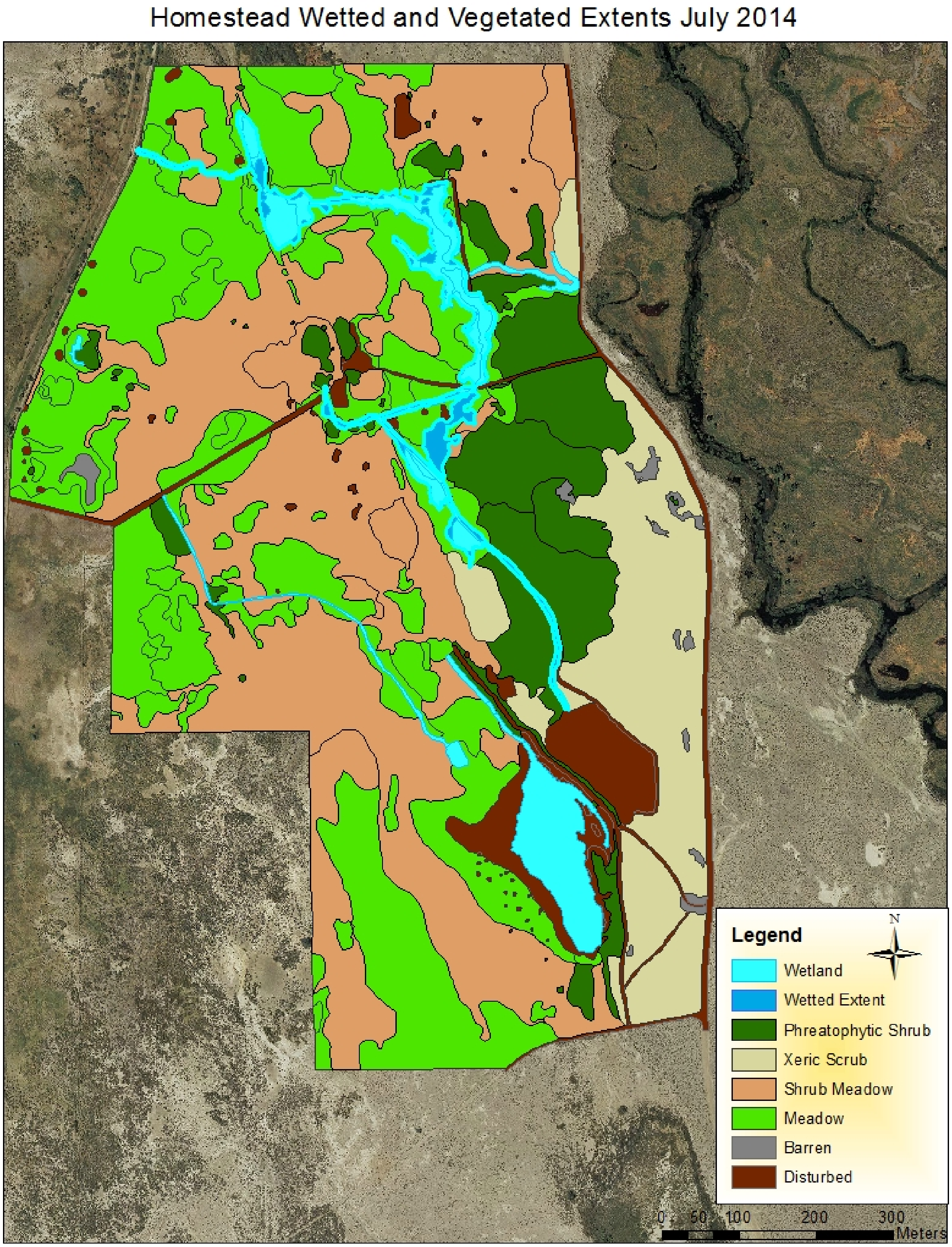


Figure 7. 13 Homestead Wetted and Vegetated Extents July 2014

Flow Monitoring

The annual water allotment for this project is 300 AF/year from two artesian well sources. These wells produced 274 AF for the project during the 2014-2015 water year. Well 419 produced 199 AF while Well 421 produced 75 AF. Flows exiting the pond via the north and south spring channels continue to be managed to prevent connectivity to the Owens River.

Much of the flow from Well 419 continues to be sent south via the tee and old irrigation ditch that was reestablished in 2013. LADWP began using this ditch to support required project flows that would otherwise connect with the river if released to the east as originally proposed. This tee and ditch maintain the majority of flow west of the fault by capturing it in an existing depression and creating an additional open water habitat.

Photo Point Monitoring

Photo points were established in March 2012 and were recaptured at the peak of the growing seasons in 2012-2014. These photos can be made available upon request.

The non-woody vegetation along the main spring channel is well established. Cattle grazing appears to have positively influenced the spring channel by reducing cattails that dominated the channel last year, thereby opening the channel to allow for wetland obligate species to establish (see photos below).

Homestead main spring channel, July 2013

Homestead main spring channel, July 2014

Woody Recruitment

Natural recruitment of native non-woody species has occurred on approximately two-thirds of the pipeline berm and is comparable to last year. These species include saltgrass, Alkali sacaton, Salt heliotrope, American licorice and Boraxweed (*Nitrophila occidentalis).* However, there are a few saltcedar seedlings growing near the tee of the pipeline as well as two along the south spring channel. A few Fivehorn smotherweed plants have established in this area as well.

The surface area of the pond continues to be dominated by cattails; however, non-woody vegetation is well established and healthy. There are three healthy 4-foot tall Red willows growing amongst the cattails on the pond shoreline (see photo below). Following the shoreline south there is additional recruitment of 15 Red and Narrowleaf willows between 1 and 2 feet tall. Where the berm meets the road there is also a 4-foot tall Fremont cottonwood that was not observed in 2013. Saltgrass recruitment has increased and continues to fill in bare gaps on the berm along the east side of the pond. There is also a saltcedar tree with sprouts approximately 150 feet from the road heading north on the berm.

Homestead pond depicting red willow recruitment, July 2014

The tee-ditch terminus has some non-woody vegetation recruitment, but saltcedar is beginning to establish vigorously throughout the area. American avocets and northern shovelers were observed utilizing the open water of the pond at the terminus during monitoring.

Fence Condition

Not applicable.

Recommendations

No additional planting or seeding is necessary at this time, as recruitment of desirable species is naturally occurring. LADWP will continue managing flows as necessary for this project to ensure that there is no connectivity to the Owens River. The T-ditch terminus will be a priority for additional treatment of saltcedar and monitoring for resprouts will continue to occur.

7.2.10. Well 368

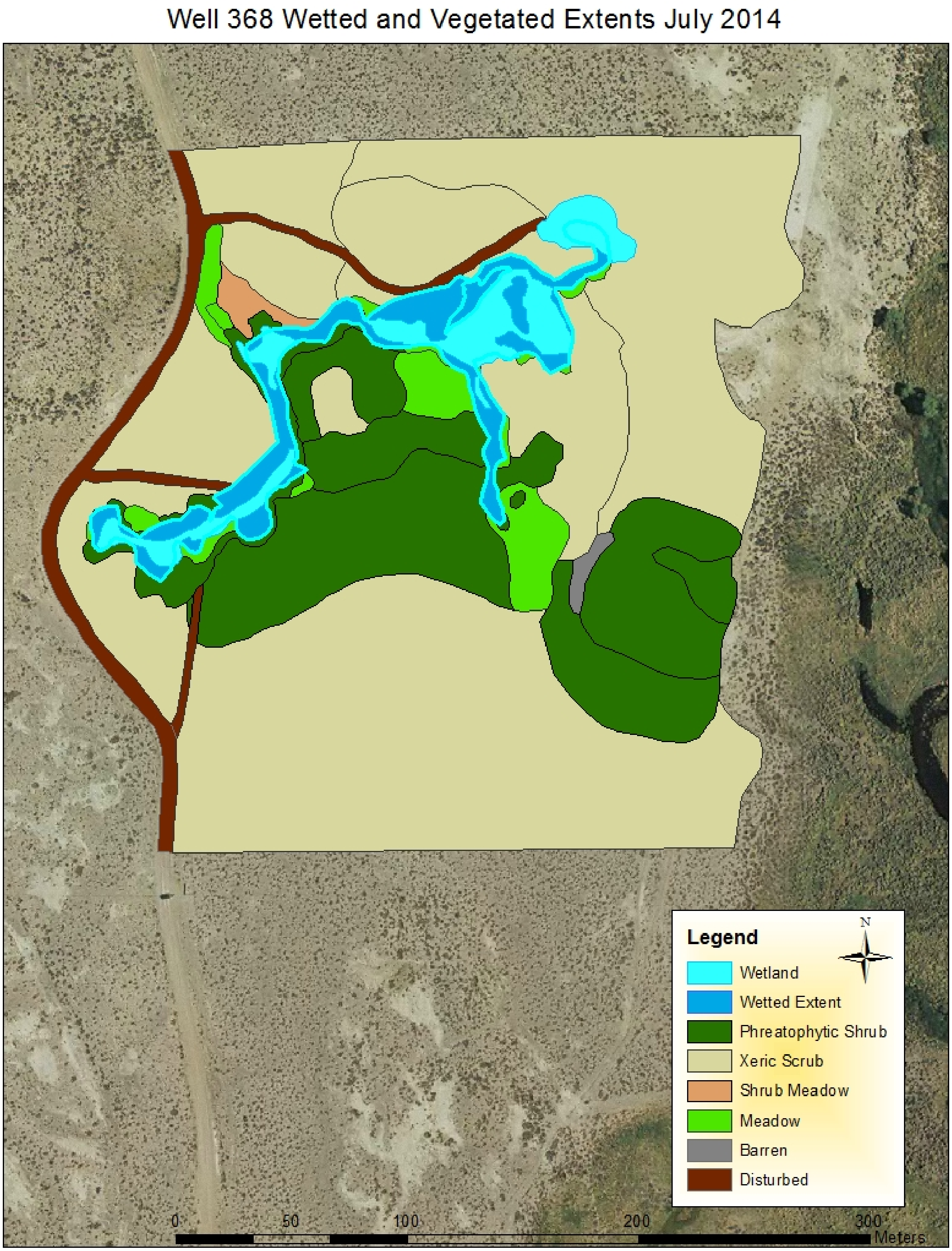


Figure 7. 14 Well 368 Wetted and Vegetated Extents July 2014

Flow Monitoring

The annual water allotment for this project is 150 AF/year. LADWP released 124 AF to this project during the 2014-2015 water year. Owens Valley pupfish (*Cyprinodon radiosus*) remain abundant throughout the extended habitat area.

Photo Point Monitoring

Photo points were established in March 2012 and were recaptured at the peak of the growing seasons in 2013-2014. These photos can be made available upon request.

Vegetation along the eastern berm remains patchy but recruitment of Scratchgrass *(Muhlenbergia asperifolia)*, Saltgrass and Salt heliotrope has increased compared to last year and is healthy and thriving. Native riparian vegetation on the banks of the pupfish marsh is dense and vigorous; however, open water within the pupfish marsh has been inundated with Cattails. Cattails continue to significantly increase within the project area (see photos below).

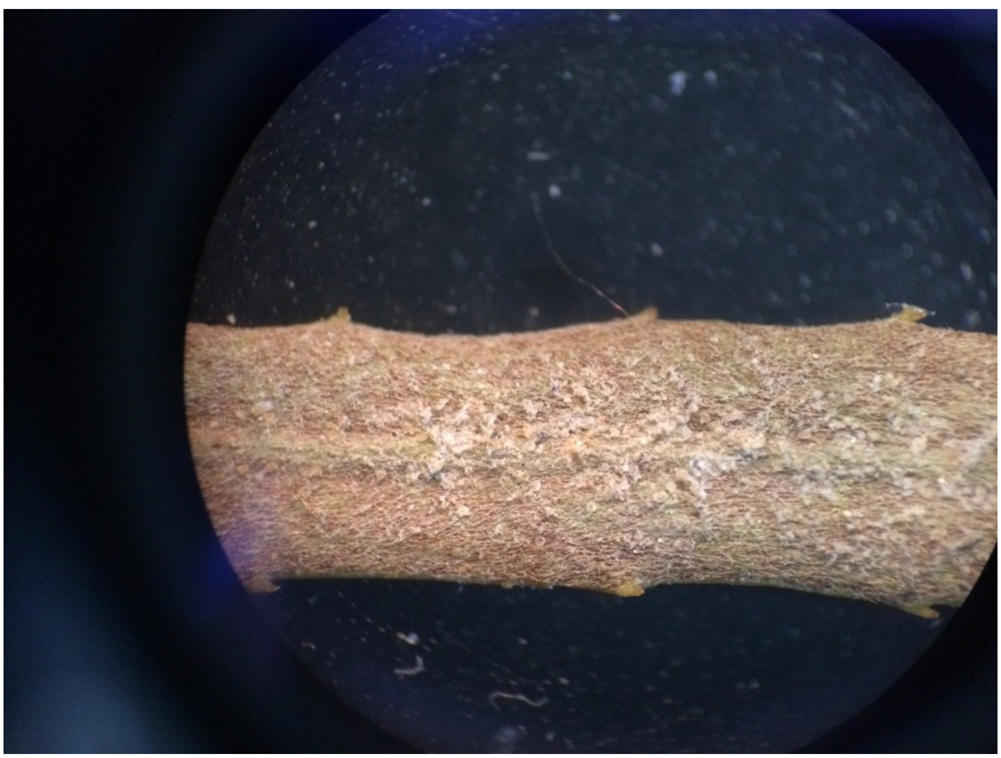
Well 368 eastern berm, July 2014

Well 368 pupfish marsh, July 2014

Woody Recruitment

Narrowleaf willow recruitment is occurring throughout the project area, particularly south of the pipe outfall and in the road depression that receives overflow from the pupfish pond. The lower pond area is dry but riparian vegetation is still thriving and new Narrowleaf willow recruitment is occurring throughout this area as well. New seedlings and growth from this year appear healthy; however, one concentrated section of Narrowleaf willows to the west of the pipe outfall continues to be stressed as they did last year. Some of these willow branches and leaves have browned and under a microscope foliar damage has occurred (see photos below). Upon closer examination, small scale bugs were found clinging to the sides of branches and nodules of leaves. Scale bugs extract sap from plant tissues and target the undersides of leaves and leaf joints, which could explain the foliar damage. Speaking with Master Gardener experts in the Owens Valley, the dieback pattern on the willows with the addition of leaf curl and damage to the outer bark indicates the presence of cankers. Willow cankers are a fungal disease caused by stress, such as drought, frost and nitrogen deficiencies and develop at wound sites made by insects, such as scale bugs in this case. The bark on the branches of these willows exhibited lesions, which shrivel and crack at the junction between living and dead tissue. Management to control the canker is recommended before it reaches the root zone of the plants.

Stressed narrowleaf willow west of pipe outfall, July 2014



Narrowleaf willow depicting foliar damage under microscope, July 2014

The road depression that receives overflow from the pupfish pond became inundated with saltcedar seedlings throughout the summer months of 2014. In September 2014, LADWP biologists manually removed an estimated 700 seedlings from this area (see photos below).

Before saltcedar removal at road depression crossing, September 2014

After saltcedar removal at old road dip crossing, September 2014

Fence Condition

Not applicable.

Recommendations

There is abundant recruitment of desirable woody and non-woody species occurring throughout the newly flooded project area and no additional seeding or planting is necessary at this time. Monitoring will continue for saltcedar seedlings in the project area and will be eradicated as resources are available.

The dieback pattern of the narrowleaf willows has been determined to be the result of branch cankers. To control the canker infection these narrowleaf willows should be cut back to their stumps. If the stumps have serious discoloration or decay the canker infection has reached the root ball and should be removed. Otherwise, if they appear healthy, they should be allowed to resprout naturally. It is possible that canker may come back in the resprouts. If this occurs, they should be cut back again. Monitoring will continue to occur.

LADWP and CDFW will collaborate on implementing a habitat improvement plan to clear cattails at the pupfish marsh to improve pupfish habitat. LADWP biologists may assist CDFW crews to implement such activities.

7.2.11. Diaz Lake

Flow Monitoring

250 AF of water is allotted for this project. LADWP released 248 AF to the project during the 2014-2015 water year.

Other Monitoring

The lake shore was monitored for pepperweed. No pepperweed was observed but saltcedar and Russian olive are present on the northeastern shore. One saltcedar was observed on the mid-west shore. Large boulders were placed around the lake shore in 2012 to block boat access to prevent the spread of the invasive quagga and zebra mussels. There were no signs of vandalism to these barriers and signage appeared to be in good condition. Photos were taken of the boulders and signs blocking boat access around the lake (see photo below).

Diaz Lake depicting rock barriers in good condition, July 2014

Recommendations

Saltcedar and Russian olive will be eradicated when resources are available and monitoring for these species, as well as pepperweed, will continue.

7.3. Annual Report on the Owens Valley Land Management Plan (OVLMP)

Introduction

Section II.B of the 1997 MOU describes the requirement for a land management plan for City of Los Angeles (City) non-urban lands in the Owens River Watershed in Inyo County (excluding the LORP planning area). The 1997 MOU states that LADWP shall continue to protect water resources used by the citizens of Los Angeles while providing for the continuation of sustainable uses such as recreation, livestock grazing, agriculture, and other activities. In doing so, LADWP shall promote biodiversity and healthy ecosystems, and address situations or problems that occur from the effects of various land uses on City property. The 1997 MOU states that priority is to be given to riparian areas, irrigated meadows, and sensitive plant and animal habitats.

Subsequently, LADWP developed the OVLMP (LADWP and Ecosystem Sciences 2010) to fulfill this requirement of the 1997 MOU and guide management of the City's lands in the Owens Valley. The OVLMP consists of 10 chapters that describe current conditions and future management of grazing, riverine-riparian ecosystems, recreation, cultural resources, fire, commercial uses, threatened and endangered species, and areas of special management concern. The fundamental role of resource management is to assess and evaluate the effects of existing land and water use practices, and recommend flow management and land management improvements if necessary.

CEQA Process for the OVLMP

An Initial Study and Mitigated Negative Declaration (MND) (LADWP 2010) was prepared for the OVLMP in March 2010. After review of the comments received and based on the information in the Initial Study, LADWP determined that with adoption of mitigation measures, implementation of the OVLMP would not have a significant impact on the environment. The final MND and Mitigation Monitoring and Reporting Program were approved by the City of Los Angeles Board of Water and Power Commissioners on June 1, 2010. A Notice of Determination was filed with the Inyo County Clerk on June 2, 2010.

7.3.1. OVLMP Grazing Management Component

Introduction

The land use component of the Owens Valley Annual Report is composed of project elements related to livestock grazing management. Under the land management program, the intensity, location, and duration of grazing is managed through the establishment of riparian pastures, forage utilization rates, and prescribed grazing periods (described in Section 3.3 Owens Valley Land Management Plan, 2010). Other actions include protection of rare plant populations, establishment of off-river watering sources (to reduce use of the river and off-river ponds for livestock watering) and the monitoring of utilization and rangeland trend throughout the leases to ensure that grazing rates maintain the long-term productivity.

Grazing management plans developed modified grazing practices in riparian and upland areas on Los Angeles Department of Water and Power (LADWP) leases in order to support Owens Valley Land Management Plan (OVLMP) goals. There are 40 leases contained in the Owens Valley Report; the ST Ranch Lease (RLI-483), 3V Ranch Lease (RLI-435), Reata Ranch Lease (RLI-453), Horseshoe Bar Ranch Lease (RLI-462), Rainbow Pack Outfit Lease (RLI-460), Rockin C Ranch Lease (RLI-493), Rafter DD Ranch Lease (RLI-439), Quarter Circle B Ranch Lease (RLI-404, 413), CT Ranch Lease (RLI-451,500), Mandich Ranch Lease (RLI-424), LI Bar Ranch Lease (RLI-487), U Bar Ranch Lease (RLI-402), Round Valley Ranch Lease (RLI-483), Big Pine Canal Lease (RLI-438), Cashbaugh Ranch Lease (RLI-411), Warm Springs Ranch Lease (RLI-497), Reinhackle Ranch Lease (RLI-492), Four J Cattle Ranch Lease (RLI-491 and 499), Rockin DM Ranch Lease (RLI-420), Baker Road Ranch Lease (RLI-475), Aberdeen Pack Lease (RLI-479), Coloseum Ranch Lease (RLI-407), Three Corner Round Ranch Lease (RLI-464), Eight Mile Ranch Lease (RLI-408), Fort Independence Ranch Lease (RLI-406,489), Georges Creek Parcel (RLI-489), JR Ranch Lease (RLI-436), Lone Pine Dairy Lease (RLI-452), Mount Whitney Pack Lease (RLI-495), Horse Shoe Ranch Lease (RLI-480), Olancha Creek Adjunct (RLI-427), Home Place Adjunct (RLI-428A), Archie Adjunct (RLI-489), Blackrock Ranch (RLI-428), Intake Ranch Lease (RLI-475), Island Ranch Lease (RLI-489), Delta Ranch Lease (RLI-490), Lone Pine Ranch Lease (RLI-456), Thibaut Ranch Lease (RLI-430), Twin Lakes Ranch Lease (RLI-491). Maps detailing the locations of each of these leases can be found in the Owens Valley Land Management Plan (2010).

7.3.1.1.Utilization

The *Owens Valley Land Management Plan* identifies grazing utilization standards for upland and riparian areas. Utilization is defined as the percentage of the current year's herbage production consumed or destroyed by herbivores. Grazing utilization standards identify the maximum amount of biomass that can be removed by grazing animals during specified grazing periods. LADWP has developed height-weight relationship curves for native grass and grass-like forage species in the Owens Valley using locally-collected plants. These height-weight curves are used to relate the percent of plant height removed with the percent of biomass removed by grazing animals. Land managers can use this data to document the percent of biomass removed by grazing animals and determine whether or not grazing utilization standards are being exceeded. Utilization data collected on a seasonal basis (mid- and end-points of a grazing period) will determine compliance with grazing utilization standards, while long-term utilization data will aid in the interpretation of range trend data and will help guide future grazing management decisions.

The calculation of utilization (by transect and pasture) is based on a weighted average. Therefore, species that only comprise a small part of available forage contribute proportionally less to the overall use value than more abundant species.

Riparian and Upland Utilization Rates and Grazing Periods

Under the *Owens Valley Land Management Plan* (OVLMP), livestock are allowed to graze in riparian pastures during the grazing periods prescribed for each lease (see Sections 3.4.1 through 3.4.50 OVLMP). Livestock are to be removed from riparian pastures when the utilization rate reaches 40%, at the end of the grazing period, or before May 1 from pastures along the Owens River that are within the boundaries of the Southwestern Willow Flycatcher recovery zone. The beginning and ending dates of the lease-specific grazing periods may vary from year-to-year depending on conditions such as climate and weather, but the duration remains approximately the same. The grazing periods and utilization rates are designed to facilitate the recruitment and establishment of riparian shrubs and trees.

In upland pastures, the maximum utilization allowed on herbaceous vegetation is 65% annually if grazing occurs only during the plant dormancy period. Once 65% is reached all pastures must receive 60 continuous days of rest for the area during the plant “active growth period” to allow seed set between June and September. If livestock graze in upland pastures during the active growth period (that period when plants are “active” in putting on green growth and seed), maximum allowable utilization on herbaceous vegetation is 50%. The utilization rates and grazing periods for upland pastures are designed to sustain livestock grazing and productive wildlife habitat through efficient use of forage. Riparian pastures may also contain upland habitat. If significant amounts of upland vegetation occur within a riparian pasture or field, upland grazing utilization standards will also apply to these upland habitat types. Livestock will be removed from a riparian pasture when either the riparian or the upland grazing utilization standards are met. Typically riparian utilization rate of 40% is reached before 65% use in the uplands occurs. Because of this pattern, utilization is not quantitatively sampled in adjacent upland areas, but use is assessed based on professional judgment. If utilization appears greater than 50% then utilization estimates using height weight curves will be implemented on the upland areas in the riparian field.

7.3.1.2.Utilization Monitoring

Monitoring methodologies are fully described in Section 4.6.2 of the *Lower Owens River Monitoring Adaptive Management and Reporting Plan* (Ecosystem Sciences, 2008), as they are also used for monitoring City land within the Lower Owens River Project Area.

Utilization is compliance monitoring and involves determining whether the utilization guidelines set forth in the grazing plans are being adhered to. Similar to precipitation data, utilization data alone cannot be used to assess ecological condition or trend. Utilization data is used to assist in interpreting changes in vegetative and soil attributes collected from other trend monitoring methods.

Utilization monitoring is conducted annually. Permanent utilization transects have been established in upland and riparian areas of pastures within the MORP, LORP, and areas outside these two project locations. An emphasis has been placed on establishing utilization monitoring sites within riparian management areas. Each monitoring site is visited prior to any grazing in order to collect ungrazed plant heights for the season. Sites are visited again approximately mid-way through the grazing period (mid-season) and again at the conclusion of the grazing period (end-of-season).

Utilization estimates are conducted on all range trend transects if there is an adequate amount of the key forage species (Alkali sacaton, saltgrass, etc.). There are additional utilization transects not associated with range trend sites. These are designated as spatial utilization transects and will be read annually as long as they represent typical use in a pasture. If they fail to be representative (e.g. fire, flooding, and change in grazing patterns) they will be temporarily or permanently abandoned.

Watershed Resources staff will update each lessee with their mid-season and end-of-season utilization results for each year. During that time the lessee will also be provided with next years target utilization stubble heights for riparian and upland management areas. This will allow LADWP and the lessees to communicate and make grazing management changes as needed in order to meet land management goals.

Target stubble heights have been calculated for each transect and pasture on a given lease and distributed to each lessee, to allow compliance with the set utilization standards. To calculate target stubble heights, ungrazed plant heights are collected after the end of the growing season to allow the plants to reach maximum production before the grazing season begins. The ungrazed heights are then averaged by species and transect in order to calculate the stubble heights that will meet the utilization standards for each field. The resulting calculated stubble heights are based on the same height/weight curves used in the mid- and end-of-season utilization calculations. The target stubble height information is provided to the lessees so that they may monitor utilization on their lease throughout the grazing season.

7.3.1.3.Range Trend

Overview of Monitoring and Assessment Program

Monitoring was conducted at all irrigated pastures and at key areas within riparian and upland management areas. Areas not identified as irrigated pasture, riparian management areas, or springs and seeps are considered upland management areas. Monitoring and assessment of key sites in riparian and upland management areas includes utilization and range trend monitoring.

This report presents data collected during various periods typically beginning in 2007. Each site will generally be read every three years unless a significant change has occurred such as a fire or a major change in management.

A description of monitoring methods, data compilation and analysis techniques can be found in the *2008 LORP Monitoring, Adaptive Management and Reporting Plan*. Descriptions of the range trend monitoring sites and their locations on the leases are in the individual lease monitoring narratives and maps in this section.

Because of the high resource value associated with riparian areas on LADWP property in the Owens Valley, the majority of the monitoring plots are either located on Moist Floodplain and Saline Meadow sites in close proximity to the Owens River.

Utilization is compliance monitoring and involves determining whether the utilization guidelines set forth in the grazing plans are being adhered to. Similar to precipitation data, utilization data alone cannot be used to assess ecological condition or trend. Utilization data is used to assist in interpreting changes in vegetative and soil attributes collected from trend monitoring methods.

Following implementation of the grazing management plans, the utilization standard for riparian management areas is 40%. The utilization standard for upland areas is 65% if grazing occurs during the plant dormancy season. The standard for upland areas is 50% if grazing occurs during the active plant growing period; however, if the pasture is completely rested for a minimum of 60 continuous days during the latter part of the active stage to allow seed set, allowable forage utilization is 65%.

These standards are not expected to be met precisely every year because of the influence of annual climatic variation, livestock distribution and the inherent variability associated with techniques for estimating utilization. Rather, these levels should be reached over an average of several years. If utilization levels are consistently 10% above or below desired limits during this period, adjustments should be implemented (Holecheck and Galt, 2000; Smith et al., 2007).

An additional driver for the 40% utilization rate on riparian pastures in the northern portion of the Owens Valley are grazing requirements as they relate to the federally listed Southwestern Willow Flycatcher. Within the Middle Owens River management area, beginning from just north of Tinemeha Reservoir to Pleasant Valley and adjacent Horton Slough, LADWP and the United States Fish and Wildlife (USFWS), developed a Conservation Strategy designed to increase the endangered Southwestern Willow Flycatcher habitat in the Owens Valley. This strategy also specifies a 40% utilization limit along the river with livestock grazing permitted between October and May of each year.

Range trend monitoring involves the quantitative sampling of the following attributes: frequency of all plant species, canopy cover estimates for herbaceous plant species, line intercept sampling for shrub canopy cover, estimates for ground cover, shrub density, and age classification of shrubs. Photo documentation of the site conditions is included as part of range trend monitoring.

Range trend monitoring at permanent transects provides quantitative data to determine the state of monitoring sites relative to baseline conditions and how a given site compares to the desired plant community. The desired plant community can be one of several plant communities that may occupy a site or one that has been identified through a management plan to best meet the plan's objective for the site. The desired plant community must protect the site as a minimum and may be described as dynamic, changing through time, or within a range of variability (Bedell, 1988). Until site-specific objectives are established, the desired plant community, which will serve as the benchmark for evaluating conditions, will be the “reference plant community” described in the ecological site description for a site. The reference plant community is the historic climax or potential plant community described for each ecological site.

Ecological site descriptions are a tool developed by USDA Natural Resource Conservation Service (NRCS) that can be used to assist in management decisions. Ecological sites are distinct units distinguished between one another by significant differences in potential vegetation composition or production between soils (NRCS, 2003). Ecological site descriptions are represented spatially as soil map units, developed from soil survey data in the Owens Valley.

Soil surveys in the area were conducted by NRCS and the final data can be found in the *Soil Survey of Benton-Owens Valley Area, California, Parts of Inyo and Mono Counties* (USDA NRCS, 2002). Vegetation data used to develop the ecological site descriptions were collected by LADWP between 1984 and 1994. This vegetation data is also referred to as “baseline” as described in the *Green Book for the 1990 Long-Term Groundwater Management Plan for the Owens Valley and Inyo County.* Ecological site descriptions include the expected production (pounds per-acre) for each soil map unit based on growing conditions (normal, favorable, unfavorable). Yearly growing conditions are based on annual precipitation data (October through September).

Nested frequency, cover, and shrub age classification data are presented for each lease and are presented as range trend transect data tables for each sampling transect and sampling year. To compare range trend sites to the associated reference plant community in the ecological site descriptions, the soil map unit that each transect was located on was cross-referenced to the *Soil Survey of Benton-Owens Valley Area, California*, *Parts of Inyo and Mono Counties* (USDA NRCS, 2002). The soil map unit narrative references the ecological site descriptions. The ecological site description describes the potential plant community by percent composition by dried weight of the major plant species. The potential plant community information does not set a specific percent composition for each species, but specifies an expected range of abundance of each of the major plant species by soil type and ecological site.

The majority of land management monitoring transects are located on the Moist Floodplain Ecological Site (MLRA 29-20). The site describes axial-stream floodplains. This ecological site does not include actual river or stream banks. Moist floodplain sites are dominated by saltgrass and to a lesser extent Alkali sacaton and Beardless wildrye (*Leymus triticoides*). Only 10% of the total plant community is expected to be composed of shrubs and the remaining 10% forbs.

Saline Meadow ecological sites (MLRA 29-2) are the second most commonly encountered ecological sites on the MORP. These sites are located on fan, stream, lacustrine terraces, and may also be found on axial stream banks. Potential plant community groups are 80% perennial grass with a larger presence of alkali sacaton than moist floodplain sites. Shrubs and trees comprise up to 15% of the community while forbs are only 5% of the community at potential. Saline Bottom (MLRA 29-7) and

Sodic Fan (MLRA 29-5) ecological sites were also associated with several range trend sites. These are more xeric stream and lacustrine terrace sites. Saline Bottom ecological sites still maintain up to 65% perennial grasses, the majority of which is alkali sacaton, while shrubs compose up to 25% of the plant community, and forbs occupy the remaining 10%. Sodic Fan ecological sites are 70% shrubs, primarily Nevada saltbush (*Atriplex torreyi*), with a minor component of alkali sacaton of up to 25% and 5% forbs.

With regard to the ecological site descriptions for the Owens Valley, management objectives for a given area may or may not correlate directly to high similarity indexes or different seral conditions. For example, a portion of the reference plant communities described for the moist floodplain ecological site allow for a species composition (dry weight) of 10% for shrubs and 80% for perennial grass; optimum wildlife habitat for a particular species might require more woody plants than allowed for and livestock production would improve with a greater percent composition of perennial grass and a decrease in shrubs. Each of these scenarios are feasible through different management prescriptions but none would reflect a high similarity to the reference plant community for the ecological site. Furthermore, due to historical or existing disturbances or the presence of nonnative species, attaining “excellent condition” or 76-100% similarity may not be feasible.

It is important to point out that reference plant communities associated with ecological sites are amalgamations of both existing reference sites and professional judgment of what the site’s potential could have been under pristine conditions. The reference plant community is a conceptual model intended to help managers gauge how a site compares to what potentially could be found on similar sites; to expect any existing location to identically match the described community would be erroneous. Estimating how similar a given site is to its potential described in the ecological site description is useful when conducting an inventory across an area but if repeat monitoring is available for the site (as it is for most LADWP leases) changes over time (trend), when compared to baseline data collected at the same location, is a more effective approach to assessing the trend of that particular key area because comparisons are made directly to the site and not between the key area and a reference plant community in an ecological site description which ultimately has no physical existence. For this reason similarity indices were not calculated and discussions in trend will not focus on changes in similarity indices.

Reference plant community data is derived from annual aboveground production (dry weight). The vegetative attribute of annual production and canopy cover are very sensitive to annual growing conditions and will therefore vary in accordance to natural climatic fluctuations. Annual production and canopy cover are inappropriate attributes to interpret long-term impacts of management decisions on plant communities when compared to other plant monitoring methods such as nested frequency.

Because frequency data is sensitive to plant densities and dispersion, frequency is an effective method for monitoring and documenting changes in plant communities (Mueller-Dombois and Ellenberg, 1974; Smith et al., 1986; Elzinga, Salzer et al., 1988; BLM 1996; Heywood and DeBacker, 2007). For this reason frequency data will be the primary means for evaluating trend at a given site during subsequent years. Based on recommendations for evaluating differences between summed nested frequency plots (Smith et al.,1987 and Mueller-Dombois and Ellenberg, 1974), a Chi-Square analysis with a Yate's correction factor was used to determine significant differences between years. Future analysis will compare estimates to the baseline datasets presented in this report.

During the pre-project period, a range of environmental conditions were encountered including "unfavorable" growing years when precipitation in the southern Owens Valley was less than 50% of the 1970-2009 average, "normal" years, when precipitation was 50-150% of average, and "favorable" conditions when precipitation was greater than 150% of average. Many of the monitoring sites responded to the variability in precipitation during the baseline period, this provided the Watershed Resources staff an opportunity to sample across a broad amplitude of ecological conditions for these sites which contributed to a robust baseline dataset.

Range trend analysis on the LORP leases began in 2002. In response to the potential critical habitat designation and subsequent MOU with the USFWS concerning the Southwestern Willow Flycatcher, rangeland analysis expanded to include the Middle Owens River areas beginning in 2007. Because of the lengthier period of monitoring on the LORP leases there is greater discussion of overall trends on those leases. As monitoring continues on the MORP leases, further discussion of results will be included in the reporting component of the project.

On transects with a long history of monitoring, trends appear to be fairly static with no obvious trajectories as each year captures and extends what appears to be the normal range of variability. The majority of range trend sites are situated on moist flood plain or saline meadow ecological sites. These sites are naturally sub-irrigated and less influenced by annual fluctuations in precipitation when compared to the more xeric ecological sites such as Saline Bottom or Sodic sites. In general perennial grass and forb communities on the mesic sites are resilient to both moderate and heavy grazing, particularly if grazing occurs during the dormant season which is the case for most LADWP grazing leases. Sites where apparent trends are occurring tend to be on: 1) shrub dominated sites where encroachment accelerates in a non-linear fashion; 2) burned sites where shrub cover is significantly reduced; 3) on sites where changes in water tables act as the primary driver for plant community composition and/or species abundance. Rising water tables will reduce shrub cover on terraces as the root zone of shrubs becomes permanently inundated. A dropping water table will have the reverse effect but similar end results with increased shrub mortality as well as a shift in plant composition. Transects along the Owens River on the Twin Lake, Thibaut and Blackrock lease have experienced a spike in cover and then a subsequent mortality of Nevada saltbush on terraces closest to the water's edge. The nested frequency transects are sensitive enough to detect vegetation responses to climatic variation by tracking the increase or decrease of annual forbs and grasses on sites.

7.3.1.4.Range Trend in 2015

Range trend transects were last read in August 2014 on the Reinhackle Lease (RLI-492), S-T Ranch Lease (RLI-461), Round Valley Lease (RLI-483), Thibaut Lease (RLI-430), and the Islands Lease (RLI-489). All results from all leases are located in Section 7 Range Trend Appendix B. Significant changes on particular leases will be discussed in this chapter. Owens Valley is currently experiencing its fourth drought year. Twenty eight transects over the past three years of sampling have shown departures outside of their typical range of variability. Not all of these departures are entirely attributable to the drought. A decrease in plant frequency occurred on 61% of those transects with an increase of plant frequency on the remaining 39% of the transects.

When broken out by ecological site, drought impacts appear more pronounced on the Saline Meadow ecological sites (n=13) with 69% of the sites showing decreases in plant frequency versus a 30% plant frequency increase on the remaining sites. The comparatively more mesic Moist Floodplain sites (n=14) were equally distributed between an increase and decrease in species frequency. There appears to be no consistent relationship between dormant season grazing utilization and changes in plant frequency. All changes in plant frequency occurred on transects where grazing occurred within the stipulated levels as outlined in their management plans. On transects where grazing had exceeded allowable use levels plant frequency did not differ between sampling events.

Table 7. 4 Significant Changes in Range Trend

(Range Trend transects where plant frequency significantly (p=0.1) departed outside of previous range of variability)

Transect	Ecological Site	Species	Change direction	Sampling period	Utilization prior to sampling event
Tatum_03	Moist Floodplain	DISP	decrease	2014	45%
Tatum_03	Moist Floodplain	JUBA	decrease	2014	45%
Tatum_05	Moist Floodplain	LETR	decrease	2014	31%
Tatum_07	Saline Meadow	SPAI	increase	2014	27%
Tatum_14	Saline Meadow	JUBA	increase	2014	28%
Tatum_14	Saline Meadow	SPAI	increase	2014	28%
MEND_09	Saline Meadow	PYRA	decrease	2014	6%
MEND_09	Saline Meadow	JUBA	decrease	2014	6%

Transect	Ecological Site	Species	Change direction	Sampling period	Utilization prior to sampling event
MEND_04	Moist Floodplain	LETR	decrease	2014	5%
MEND_07	Moist Floodplain	DISP	decrease	2014	5%
YRIB_04	Saline Meadow	JUBA	decrease	2013	23%
CASHBA_06	Moist Floodplain	DISP	increase	2012	14%
CASHBA_18	Saline Meadow	DISP	decrease	2012	39%
CASHBA_18	Saline Meadow	SPAI	decrease	2012	39%
CASHBA_16	Saline Bottom	SPAI	decrease	2012	28%
CASHBA_24	Moist Floodplain	DISP	increase	2012	38%
BLKROC_13	Moist Floodplain	DISP	decrease	2013	15%
BLKROC_13	Moist Floodplain	LETR	increase	2013	15%
BLKROC_09	Saline Meadow	DISP	increase	2013	5%
BLKROC_21	Moist Floodplain	LETR	increase	2013	21%
ISLAND_08	Moist Floodplain	DISP	increase	2014	32%
THIBAUT_02	Saline Meadow	DISP	decrease	2014	29%
THIBAUT_02	Saline Meadow	SPAI	decrease	2014	29%
THIBAUT_03	Saline Meadow	GLLE3	decrease	2014	40%
THIBAUT_03	Saline Meadow	SPAI	decrease	2014	40%
THIBAUT_05	Moist Floodplain	MALE3	increase	2014	0%
THIBAUT_07	Moist Floodplain	MALE3	increase	2014	0%
DELTA_02	Moist Floodplain	DISP	decrease	2013	26%

7.3.1.5.Irrigated Pastures

Monitoring of irrigated pastures consisted of Irrigated Pasture Condition Scoring following protocols developed by the (NRCS, 2001). Irrigated pastures that score 80% or greater are considered to be in good to excellent condition. If a pasture rates below 80%, changes to pasture management will be implemented.

All irrigated pastures were evaluated in 2013. Pastures that scored 80% or below were evaluated in 2014. The results of the evaluations will be presented in a table format by lease. All irrigated pastures will be evaluated again in 2016. Persisting drought conditions through 2014 have affected water availability and delivery. Some irrigated pasture conditions have decreased regardless of management efforts. This has been taken under consideration and no management changes have been made to these leases, with above normal or normal water year conditions should improve.

7.3.2. 2015 Grazing Management Monitoring Data

7.3.2.1.ST Ranch Lease (RLI-461)

The ST Ranch Lease (10,925 acres) consists of parcels from Aberdeen, Bishop, and Round Valley. The livestock program is a commercial cow/calf operation.

The following tables present the summarized utilization data for each pasture/field, and each transect within the pasture.

Table 7. 5 Grazing Utilization for Fields/Pastures on the ST Ranch Lease, RLI-461, 2007-14

Fields/Pastures	2007	2008	2009	2010	2011	2012	2013	2014
*Calvert Slough Pasture	56%	43%	52%	51%	25%	28%	15%	46%
*Charlie Butte Field	57%	72%	62%	0%	24%	29%	15%	60%
*East River Field	73%	52%	59%	22%	19%	28%	26%	30%
*North Horton Slough Riparian	25%	23%	13%	13%	0%	21%	0%	17%
*Northeast McCumber Riparian	9%	15%	20%	0%	12%	45%	0%	3%
*Northwest McCumber Riparian	34%	0%	74%	0%	0%	59%	21%	11%
*South Horton Slough Riparian	68%	60%	68%	31%	0%	28%	0%	52%
*Southeast McCumber Riparian	24%	27%	59%	25%	28%	14%	77%	45%
*Southwest McCumber Riparian	55%	35%	90%	40%	66%	72%	0%	31%
*West River Field	53%	58%	44%	0%	66%	34%	8%	46%

Riparian Utilization, 40%

Table 7.4 Grazing Utilization for Transects on the ST Ranch Lease, RLI-461, 2007-14

Fields/Pastures	Transect	2007	2008	2009	2010	2011	2012	2013	2014
***Calvert Slough Pasture**	CALVERT_02	0%	50%	0%	55%	18%	0%	0%	0%
	CALVERT_03	0%	45%	62%	39%	0%	0%	0%	55%
	CALVERT_04	0%	0%	34%	5%	26%	0%	0%	35%
	TATUM_11	94%	70%	77%	64%	37%	69%	71%	86%
	TATUM_13	37%	22%	34%	37%	13%	42%	20%	28%
	TATUM_29	51%	46%	63%	75%	55%	0%	0%	29%
***Charlie Butte Field**	TATUM_10	57%	71%	62%	0%	24%	29%	15%	60%
***East River Field**	TATUM_07	74%	69%	67%	0%	0%	16%	31%	26%
	TATUM_08	67%	34%	65%	10%	11%	28%	28%	28%
	TATUM_09	86%	82%	77%	48%	61%	49%	30%	59%
	TATUM_12	70%	28%	39%	23%	14%	28%	22%	5%
	TATUM_14	73%	0%	47%	28%	11%	17%	17%	28%
***North Horton Slough Riparian**	TATUM_02	25%	23%	13%	13%	0%	21%	0%	17%
***Northeast McCumber Riparian**	TATUM_01	9%	14%	20%	0%	12%	45%	0%	3%
***Northwest McCumber Riparian**	TATUM_04	34%	0%	74%	0%	0%	59%	21%	11%
***South Horton Slough Riparian**	TATUM_06	68%	60%	68%	28%	0%	28%	0%	52%
***Southeast McCumber Riparian**	TATUM_03	24%	27%	59%	25%	28%	14%	77%	45%
***Southwest McCumber Riparian**	TATUM_05	55%	35%	90%	40%	66%	72%	0%	31%
***West River Field**	TATUM_15	53%	58%	44%	57%	66%	34%	8%	46%

****Riparian Utilization, 40%***

Summary of Utilization

Riparian

Utilization in the riparian pastures in 2014 was moderate with the Calvert Slough, Charles Butte and South Horton Slough riparian exceeding the 40% grazing standard. Watershed Resources staff attribute the over utilization to the persisting drought conditions, with decreased forage production due to lack of precipitation and normal spring runoff. Although the drought is amplifying grazing pressure the mandatory off date of May 1 has been more of an issue. The conservation strategy for the Southwestern Willow Flycatcher mandates that all livestock must be removed from habitat areas by May 1. The lessee of the ST Ranch has missed this date for the past two years. As a result, if livestock are not removed on May 1, 2015, grazing will be suspended in the Pleasant Valley portion of the lease for a year.

<u>Upland</u>

The uplands on the lease are comprised of abandoned agriculture and shrub dominated vegetation communities. The utilization in these areas generally occurs in the spring is relegated to annuals and shrubs.

<u>Range Trend</u>

Range trend transects were sampled in 2014 and trends remained stable within the majority of plots. Four transects departed beyond the previously observed frequency levels. Tatum_03 decreased significantly in saltgrass and wiregrass (*Juncus balticus*).

North Horton Slough Riparian Pasture

Tatum_02 is located on a Saline Meadow Ecological site in the North Horton Slough Riparian Pasture on a Torrifluvent soil unit. Frequency trends have remained static on the site during the sampling period between 2007-2010. The last sampling period in 2014 showed a significant drop in saltgrass and a significant increase in Alkali sacaton, both trends extended beyond previous ranges of variability observed from 2007 through 2010. Tatum_05 in the Southwest McCumber field also indicated significant drop in Beardless wildrye.

South Horton Slough Riparian Pasture

Tatum_06 is located on a Moist Floodplain Ecological Site on the Torrifluvents-Fluvaquentic Endoaquaolls Complex soil unit. All plant trends remained static except for saltgrass which increased in 2009 and then decreased in 2014 to levels similar to what was observed in 2007.

Northwest McCumber Riparian

Tatum_04 is located on a Saline Meadow Ecological Site, directly south the terrace elevation drops down to a Moist Floodplain Ecological Site. The entire area from the river north to chalk bluffs is mapped as a Torrifluvents-Fluvaquentic Endoaquaolls Complex soil unit. However the site is likely on a Torrifluvent soil unit. Both saltgrass and alkali sacaton have steadily increased since 2007. Baltic rush decreased in 2014 and remains as a trace amount.

Northeast McCumber Riparian

Tatum_01 is located on a Saline Meadow Ecological Site. The transect corresponds to the Torrifluvents-Fluvaquentic Endoaquaolls Complex soil unit however the site is on an elevated terrace above the functioning floodplain and exhibits botanical characteristics similar to a Torrifluvent site (Saline Meadow). Saltgrass frequency has been stable while alkali sacaton has fluctuated back to levels observed in 2007.

Southeast McCumber Riparian

Tatum_03 is located on an Moist Floodplain Ecological Site on the Torrifluvents-Fluvaquentic Endoaquaolls Complex soil unit. The site shows no trends during the sampling periods between 2007 and 2010. In 2014 there was a significant departure from all years prior with a decrease in saltgrass and wiregrass.

Southwest McCumber Riparian

Tatum_05 is located on a Moist Floodplain Ecological Site on the Torrifluvents-Fluvaquentic Endoaquaolls Complex soil unit. Beardless wildrye has decreased outside the previous recorded levels in 2014.

West River Field

Tatum_15 is located on a Saline Bottom Ecological Site on the Winerton-Hessica Complex soil unit. Frequency has remained static during the four sampling periods.

East River Field

Tatum_07 is located on a Saline Bottom Ecological Site on the Winerton-Hessica Complex soil unit. The site has remained static with the exception of the disappearance of Bud sagebrush (PIDE4) on the site in 2010 and an increase in Alkali sacaton outside previously observed levels in 2014.

Tatum_08 is located on a Saline Bottom Ecological Site on the Winerton-Hessica Complex soil unit. There are no apparent trends in the frequency data among the three sampling events.

Tatum_09 is located on a Moist Floodplain Ecological Site on the Torrifluvents-Fluvaquentic Endoaquaolls Complex soil unit. Saltgrass declined in 2014 when compared to 2009. Perennial pepperweed was found on the transect in 2014.

Tatum_12 is located on a Saline Meadow Ecological Site on the Torrifluvent soil unit. The site remains static.

Tatum_14 is situated on a Moist Floodplain Ecological Site on the Torrifluvents-Fluvaquentic Endoaquaolls Complex soil unit. Aerial photos from 2009, 1981, and 1944 show a steady conversion of an herbaceous dominated floodplain to a shrub dominated floodplain. Saltgrass has remained relatively static while Wiregrass and Alkali sacaton have increased in 2014 to levels not seen during previous sampling events.

Charlie Butte Field

Tatum_10 is located on a Saline Meadow Ecological Site on the Shondow Loam soil unit. Frequency values remained static.

Calvert Slough Pasture

Tatum_11 is located on a Moist Floodplain Ecological Site on the Torrifluvents-Fluvaquentic Endoaquaolls Complex soil unit. Trends remain static when compared across all years (2007, 2009, 2010, and 2014).

Tatum_13

Tatum_13 is found on a Moist Floodplain Ecological Site on the Torrifluvents-Fluvaquentic Endoaquaolls Complex soil unit. The site has remained static across all four sampling periods.

Tatum_29

Tatum_29 is located on a Saline Bottom Ecological Site on the Pokonahbe Loamy Fine Sand, 0-2% Slopes. No trends in frequency were observed over the five sampling periods with the exception of a spike in Bushy bird's beak (CORA5) as a response from the above average precipitation during the winter and spring of 2010.

Irrigated Pastures

The following table shows Irrigated Pasture Condition Scores.

Table 7. 6 Irrigated Pasture Condition Scores ST Ranch 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
N Highland Pasture	86	X	78	88	X	X	82	X
S Highland Pasture	74	78	70	86	X	X	82	X
N Y Road Pasture	X	X	70	84	X	X	80	X
S Y Road Pasture	86	X	74	86	X	X	80	X
Bogie Field	X	X	66	84	X	X	84	X
Steward Pasture	84	X	82	84	X	X	84	X
North Horse	X	X	X	82	86	X	84	X
West Horse	84	X	X	82	88	X	82	X
Wanacott	82	X	78	84	X	X	84	X
Horse Trap	94	94	86	94	X	X	92	X
Mare Pasture	90	90	84	92	X	X	86	X
Front Pasture	80	80	86	90	X	X	86	X
Swamp Pasture	80	80	82	88	X	X	86	X
Castaway Pasture	X	X	74	86	X	X	80	X
Calvert Slough	X	X	X	84	X	X	80	X

X indicates no evaluation made

Summary of Irrigated Pastures

Watershed Resources staff has been working with the lessee to improve irrigated pasture condition scores since 2007. One of the main problems on the lease was water management and availability which, was being impeded by old irrigation diversions and lack of water supply. A new irrigation schedule was implemented and maintenance and repairs to ditches and head gates has improved irrigated pasture condition scores.

Stockwater Sites

There are no stockwater sites planned for the ST Ranch Lease. Stockwater is provided by the Owens River and irrigation diversions on the lease.

Fencing

In 2009, a 4.5-mile fence was constructed in Pleasant Valley on the south side of the Owens River. Included as part of this fence were two cross fences that helped create six riparian pastures. In 2010, a 1-mile of fence was constructed on the east end of the existing Pleasant Valley fence that is located on the north side of the Owens River. All fence was constructed as part of the *Conservation Strategy for the Southwestern Willow Western Flycatcher,* and to protect riparian habitat as it recovered from a wild fire that occurred in 2007.

Salt and Supplement Sites

Feed pellets that contain trace minerals and protein are distributed for supplement on the lease.

7.3.2.2.3V Ranch Lease (RLI-435)

The 3V Ranch, west of Bishop is 33 acres. There are four irrigated pastures that comprise the lease and, they are grazed on a rotational grazing schedule year round.

The ranch is a commercial cow/calf operation.

All pastures on the lease are irrigated so there is no utilization monitoring.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 7 Irrigated Pasture Condition Scores 3V Ranch Lease RLI-435, 2007-14

Pastures	2007	2008	2009	2010	2011	2012	2013	2014
Swamp	96	X	X	90	X	X	72	70
Front	96	X	X	94	X	X	88	X
Horse	96	X	X	94	X	X	84	X
Little	96	X	X	94	X	X	82	X

X indicates no evaluation made

Summary of Irrigated Pastures

Irrigated pasture scores on the 3V Ranch lease had been consistently high since 2007. In 2010 a new irrigation schedule was implemented that measured irrigation water allotments more accurately. As a result any excess water that was received previously, was no longer available. Drought conditions have decreased irrigation water delivery, and consequently irrigated pasture scores have also decreased. The Swamp Pasture will be evaluated again in 2015 and if the score remains below 80, management changes will be required.

Stockwater Sites

Stockwater is provided by irrigation diversions on the lease.

Fencing

There has been no new fencing on the lease, and there is none planned for the future beyond normal maintenance.

Salt and Supplement Sites

Cattle are fed hay and protein supplement during the winter.

7.3.2.3.Reata Ranch Lease (RLI-453)

The Reata Ranch (139 acres) consists of the Fish Slough Parcel (84 acres), north of Bishop; and the Reata Parcel (55 acres), west of Bishop. The ranch is a cow/calf operation; pairs spend summer months on private property and winter on the Reata Parcel. The Fish Slough Parcel is in nonuse.

Since the Fish Slough Parcel is in nonuse and the remaining pastures on the lease are irrigated, utilization is not monitored.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 8 Irrigated Pasture Condition Scores Reata Ranch Lease RLI-453, 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
North Reata	86	X	X	90	X	X	90	X
South Mummy	86	X	X	88	X	X	84	X
Bishop Creek	86	X	X	92	X	X	90	X
South Reata	92	X	X	90	X	X	90	X
North Mummy	84	X	X	84	X	X	84	X

X indicates no evaluation made

Summary of Irrigated Pastures

All of the irrigated pastures have maintained healthy condition since 2007 and no management changes have been recommended.

Stockwater Sites

Stockwater is provided by irrigation diversions and Bishop Creek.

Fencing

No new fencing has been constructed on the lease, nor is any planned for the future beyond normal maintenance.

Salt and Supplement Sites

Cattle are supplemented with hay and protein during the winter months.

7.3.2.4.Horseshoe Bar Ranch Lease (RLI-462)

The Horseshoe Bar Ranch (336 acres) is a cow/calf operation that consists of two separate parcels: the 141-acre Sewer Parcel, which lies to the east of Bishop; and the 195-acre Dairy Parcel, which lies west of Bishop. Pastures are typically grazed during the winter months but, the Sewer Parcel does get some grazing during the summer. Utilization monitoring is not needed on this lease because the lease is solely comprised of irrigated pastures.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 9 Irrigated Pasture Condition Scores Horseshoe Bar Ranch Lease RLI-462, 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
West Pasture	82	X	X	90	X	X	84	X
Front Pasture	82	X	X	92	X	X	84	X
Sewer Pasture	82	X	X	88	X	X	88	X

X indicates no evaluation made

Summary of Irrigated Pastures

The irrigated pastures were low but within the irrigated pasture condition minimum score of 80% in 2007. Low pasture condition scores was attributed to old irrigation diversion which did not convey water effectively. Since that time new head gates have been constructed and the lessee has been able to irrigate more effectively. However, weed infestation is still an issue lowering scores.

Stockwater Sites

All stockwater is provided by irrigation diversions.

Fencing

There has been no new fencing constructed on the lease, and there are no planned fencing projects beyond normal maintenance.

Salt and Supplement Sites

Cattle are supplemented with protein tubs during the winter.

7.3.2.5.Rainbow Pack Outfit Lease (RLI-460)

The Rainbow Pack Outfit Lease (144 acres) is a commercial pack operation that grazes horses and mules. The lease consists of the Wye Road, Brockman, and Dutch John Parcels, all in the Bishop area. The Wye Road Parcel consists of the Spruce Street and the Wye Road Fields, which are separated by a ditch. The Brockman pasture is irrigated and is located just off of Highway 395 and Brockman lane. The Dutch John Parcel is located up the Bishop Creek drainage off of Highway 168, it currently does not receive any use.

Summary of Utilization

The Wye Road Field is the only field on the lease that requires utilization monitoring. Livestock begin grazing in January and remain in the field until a 2-inch stubble height is reached, or rare plants Owens Valley checkerbloom (*Sidalcea covillei*) begin to start growing. When either one of these criteria are met livestock are moved from the field.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 10 Irrigated Pasture Condition Scores Rainbow Pack Outfit Ranch Lease RLI-460 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
Brockman	X	72	82	80	82	80	80	X

X indicates no evaluation made

Summary of Irrigated Pastures

In 2007, the Brockman pasture was not rated because there was no grazing allowed. At that time the condition of the pasture was too poor to allow any grazing. In 2008 irrigated pasture condition improved as a result of better irrigation practices and grazing management. Since 2008 conditions of the pasture have increased to meet the minimum pasture condition score of 80%. Water distribution and weeds have continued to be a problem that the lessee is working on. Annual monitoring of this pasture will continue until a consistent upward trend in scores is achieved.

Summary Wye Road Field

Since 2011 the Wye Road field has not been grazed. Horses and mules that normally use this field have been moved to different grazing areas. No monitoring was needed for the Wye Road field in 2014.

Stockwater Sites

Stockwater is provided by irrigation diversions.

Fencing

A temporary fence was constructed by the lessee in the Wye Road Field in 2008 to prevent livestock from crossing to the south end of the field. This was done to utilize available forage on the north end of the pasture, which had not yet met the utilization stubble height of 2 inches. Since then, the lessee has been maintaining the fence.

Salt and Supplement Sites

A large supplement area had been established on the west side of the Wye Road field. This site became degraded, harming vegetation and it was in close proximity to a stream so the lessee was asked to move the site. The lessee moved the site to the north end of the field where there is a large disturbed area. This has now become the new supplement site.

7.3.2.6.Rockin C Ranch Lease (RLI-493)

The Rockin C Ranch (320 acres) lies east of Bishop and is used to graze cattle and five to ten horses. The livestock spend the summer on the Sewer Farm (RLI-462).

Currently there is no utilization monitoring occurring on the lease. Grazing occurs on the Sewer Farm pasture, Holding Pasture, and Little Horse Pasture which are irrigated pastures.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 11 Irrigated Pasture Condition Scores Rockin C Ranch RLI- 493, 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
Little Horse Pastue	X	X	X	X	X	X	84	X
Rain Gun Pasture	X	X	X	X	X	X	84	X

X indicates no evaluation made

Summary of Irrigated Pastures

The irrigated pastures located on the lease have not been rated for the past four years. This is due to a change of management in 2007 that lead to the reseeding and construction of a new irrigation system. Both pastures were rated in 2013 and the pastures rated above the minimum score of 80.

Stockwater Sites

There are no new stockwater sites purposed for the lease. Stockwater is provided by irrigation diversions and the Kingsley ditch.

Fencing

There are no new fencing projects proposed for the lease. In 2007 management changed on the lease and new corrals and fencing were constructed by the lessee.

Salt and Supplement Sites

Cattle and horses are fed hay in the winter along with cake and salt blocks.

7.3.2.7.Rafter DD Ranch Lease (RLI-439)

The Rafter DD Ranch (240 acres) consists of two parcels: the Round Valley Parcel (160 acres), north of Bishop and the Bishop Parcel (80 acres), east of Bishop. The Rafter DD Ranch Lease is a commercial pack operation (Frontier Packers), grazing horses and mules on the Round Valley Parcel and on the Bishop Parcel.

The Bishop parcel consists of irrigated pastures and some dry grazing located in the Desert Field. Utilization is not monitored on the lease because the Desert Field is abandoned agriculture land comprised of shrubs and annuals. The Round Valley portion of the lease consists of all irrigated pastures that get grazed during the winter by pack stock.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 12 Irrigated Pasture Condition Scores Rafter DD Ranch Lease RLI-439, 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
Mare Pasture	84	X	X	86	X	X	86	X
Pasture 1	86	X	X	92	X	X	82	X
Archy	92	X	X	92	X	X	92	X
Corral Holding	84	X	X	86	X	X	88	X
South Archy	94	X	X	94	X	X	88	X
Schober	88	X	X	90	X	X	96	X
South Schober	88	X	X	88	X	X	88	X

X indicates no evaluation made

Summary of Irrigated Pastures

The irrigated pasture condition scores for the lease have been consistently above the minimum required score of 80% since 2007. Pasture 2 is the only pasture that has not met the minimum score of 80%. A rain gun sprinkler system was installed in Pasture 2 with plans to plant the field to pasture. However, cost of running the pumps and poor irrigation uniformity has hampered the ability of the lessee to get the pasture established. Currently the lessee is researching new techniques to get the pasture established.

The Round Valley portion of the lease is in good condition and no management changes are required.

Stockwater Sites

All stockwater is provided by irrigated diversions or troughs.

Fencing

All fencing activities on the lease will consist of normal maintenance.

Salt and Supplement Sites

Hay and salt are provide for the horses and mules on the lease during the winter.

7.3.2.8.Quarter Circle B Ranch Lease (RLI-404, 413)

The Quarter Circle B Ranch (1,143 acres) lies west of Bishop. The Quarter Circle B Ranch is a cow/calf operation. The RLI-404 portion of the lease produces alfalfa or grass hay and grazes the stubble with cattle or horses.

The lease is comprised of irrigated pastures and dry grazing. Utilization monitoring is not required because, the fields consists of shrubs and annuals.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 13 Irrigated Pasture Condition Scores Quarter Circle B Ranch RLI-404 and 413, 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
Riata Pasture	76	76	76	74	70	80	78	72
Mummy Pasture	78	76	76	72	70	80	78	72
Otey Pasture	80	72	76	76	76	78	81	X

X indicates no evaluation made

Summary of Irrigated Pastures

Since 2010 pasture condition scores have been below or at the minimum standard of 80%. These pastures rate continually low, due to a lack of consistent irrigation and weed control. Sucker elm trees located in the pasture are also bringing the overall score down. The lessee has been working on removing the elms trees and spraying the weeds. They have also been working on different irrigation strategies to improve pasture condition. Yearly evaluations of the lease will continue to be made until pasture conditions improve on the lease.

Currently the lessees have sold all of the cattle on the lease and no grazing is occurring on the irrigated pastures.

Stockwater Sites

Stockwater is provided by irrigation ditches when livestock are present.

Fencing

There are no new fencing projects planned for the lease beyond normal maintenance.

Salt and Supplement Sites

Hay and protein supplement are fed to the cattle during the winter months. Site locations are in good condition at this time.

7.3.2.9.CT Ranch Lease (RLI-451,500)

The C-T Ranch (6,055 acres) consists of several different leases. The Chance Ranch Parcels RLI-451 (1,040 acres) are located in Round Valley. The first parcel (569 acres) is approximately 10 miles northwest of Bishop, east of Rock Creek Road, and north of Birchim Road. The second Parcel (471 acres) consists of the Roberts Ranch, north of Pine Creek Road and west of Rock Creek Road; and the Evans Ranch west of U.S. Highway 395 and south of Pine Creek Road. The Sunland Parcel RLI-500 (249 acres) is southwest of Bishop and west of Sunland Road; and the Patch Parcel (4,766 acres) is 13 miles northeast of Bishop in Mono County, near Chalfant Valley. The livestock program is a commercial cow/calf operation.

All of the CT Ranch that is located within Inyo County is comprised of irrigated pastures and there is no utilization monitoring needed.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 14 Irrigated Pasture Condition Scores CT Ranch RLI-451, 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
Upper Pond Pasture	92	X	X	82	X	X	88	X
Locust Pasture	94	X	X	86	X	X	86	X
Iron Gate Pasture	94	X	X	88	X	X	86	X
80 Pasture 1	96	X	X	90	X	X	86	X
80 Pasture 2	94	X	X	88	X	X	86	X
Below Hay Stack	90	X	X	88	X	X	86	X
Hay Stack Pasture	86	X	X	88	X	X	86	X
Rock Pasture	86	X	X	90	X	X	86	X
Holding Pasture	86	X	X	90	X	X	86	X
Pasture Below House	94	X	X	92	X	X	92	X
Stink Ant Pasture	88	X	X	94	X	X	86	X
Pasture #4	94	X	X	84	X	X	96	X
Derick Pasture	90	X	X	92	X	X	88	X
Pond Pasture	96	X	X	92	X	X	96	X
Lowest South Pasture	94	X	X	96	X	X	96	X
Lower Middle Pasture	92	X	X	100	X	X	92	X
Wahlene Pasture	94	X	X	98	X	X	92	X
Second Pasture	96	X	X	86	X	X	88	X
Iris Pasture	94	X	X	96	X	X	92	X
Long Pasture	88	X	X	94	X	X	84	X
Horse Pasture	88	X	X	86	X	X	88	X
Front Pasture	92	X	X	94	X	X	96	X
Alfalfa Pasture	94	X	X	86	X	X	98	X
Pine Cr Road Pasture	92	X	X	94	X	X	94	X
Four Pasture	90	X	X	90	X	X	94	X
A Pasture	94	X	X	94	X	X	98	X
B Pasture	94	X	X	90	X	X	96	X
40 Acre Pasture	92	X	X	90	X	X	96	X
F Pasture	92	X	X	94	X	X	96	X
Lou's Pasture	98	X	X	92	X	X	94	X
Highway Pasture	94	X	X	90	X	X	94	X
Bull Pasture	90	X	X	82	90	X	94	X
Orchard Pasture	90	X	X	86	X	X	90	X
G Pasture	84	X	X	90	X	X	96	X
E Pasture	84	X	X	82	94	X	98	X

X indicates no evaluation made

Table 7. 15 Irrigated Pasture Condition Scores CT Ranch RLI-500, 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
South 80	84	X	X	92	X	X	82	X
North 40	86	X	X	96	X	X	86	X
Trailer Park	86	X	X	94	X	X	86	X

X indicates no evaluation made

Summary of Irrigated Pastures

All of the pastures on the CT Ranch have been well above the required irrigated pasture condition score of 80%. The lessee's are currently working on removing a non-native ornamental perennial bunch grass by burning and spraying herbicides. There are no recommended management changes for the lease.

Stockwater Sites

There are no stockwater sites planned for the lease. All stockwater is provided by irrigation diversions or perennial streams.

Fencing

A wildfire occurred on the Round Valley portion of the lease on February 6, 2015. As a result large portions of fence and working corrals were destroyed. The lessee will be in the process of replacing fence and corrals throughout the spring and summer of 2015.

Salt and Supplement Sites

Hay and protein supplement are fed on a seasonal basis, and sites are rotated.

7.3.2.10. Mandich Ranch Lease (RLI-424)

The Mandich Ranch (165 acres) southwest of Bishop is a cow/calf operation.

The entire Mandich Ranch lease is comprised of irrigated pastures, and utilization monitoring is not required.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 16 Irrigated Pasture Condition Scores Mandich Ranch RLI-424, 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
West Schober	86	X	X	96	X	X	88	X
East Schober	86	X	X	90	X	X	88	X
North Horse	90	X	X	86	X	X	90	X
South Horse	86	X	X	86	X	X	90	X
Heifer Pasture	88	X	X	94	X	X	90	X
Jack In The Box	84	X	X	90	X	X	88	X
Sheep Pasture	90	X	X	86	X	X	90	X
East 80	88	X	X	92	X	X	90	X
West 80	88	X	X	90	X	X	90	X

X indicates no evaluation made

Summary of Irrigated Pastures

All irrigated pastures on the lease have been well above the minimum score of 80%. The lessee has just finished replacing old irrigation diversions on the lease. There is no management changes recommended.

Stockwater Sites

All water is provided by irrigation diversions.

Fencing

The lessee is currently replacing all the perimeter fences on the lease.

Salt and Supplement Sites

Hay and protein supplements are fed during the winter and all feed sites are rotated.

7.3.2.11. LI Bar Ranch Lease (RLI-487)

The LI-Bar Ranch Lease (684 acres) consists of two separate parcels: the South Bishop Place, which lies to the southeast of Bishop, east of U.S. Highway 395; and the Hess Place, which is west of Bishop, south of west Line Street, and east of Barlow Lane and is a commercial cow/calf operation.

The entire LI Bar Ranch lease is comprised of irrigated pastures, utilization monitoring is not required.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 17 Irrigated Pasture Condition Scores LI-Bar Ranch Lease RLI-487, 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
Sheep/Horse Pasture	89	X	X	92	X	X	88	X
Hess Pasture	86	X	X	94	X	X	88	X
West Line	92	X	X	94	X	X	94	X

X indicates no evaluation made

Summary of Irrigated Pastures

All irrigated pastures on the lease have consistently been in good condition since 2007. No management changes are recommended for the lease.

Stockwater Sites

All stockwater is provided by irrigation diversions.

Fencing

There is no fencing projects planned for the lease beyond normal maintenance.

Salt and Supplement Sites

Cattle are supplemented with hay pellets and protein tubs. Supplement sites are rotated each time the cattle are fed.

7.3.2.12. U Bar Ranch Lease (RLI-402)

The U Bar Ranch Lease (407 acres) lies south of Bishop, east of U.S. Highway 395 and is a cow/calf operation. The ranch is comprised of irrigated pasture and some dry abandoned agriculture.

The abandoned agriculture on the U Bar Ranch is comprised of shrubs and annuals. There are no native perennial grasses present to measure utilization.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 18 Irrigated Pasture Condition Scores U Bar Ranch RLI-402, 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
Highway North	88	X	X	92	X	X	80	X
Highway South	88	X	X	92	X	X	80	X
Upper North 40	88	X	X	90	X	X	86	X
Upper Middle	88	X	X	88	X	X	92	X
Lower Middle	92	X	X	94	X	X	92	X
Bull	88	X	X	90	X	X	92	X

X indicates no evaluation made

Summary of Irrigated Pastures

Irrigated pasture condition scores dropped in 2013 in the North and South Highway pastures, caused by inconsistent water delivery due to drought conditions. The drought conditions are temporary so no management changes are planned for the lease.

Stockwater Sites

Stockwater is provided by irrigation diversions.

Fencing

No fencing projects are planned for the lease beyond general maintenance.

Salt and Supplement Sites

Hay and protein supplement are fed to the cattle during the winter months. Feeding areas are rotated periodically for cattle health and to minimize grazing impacts.

7.3.2.13. Round Valley Ranch Lease (RLI-483)

The Round Valley Ranch Lease (19,780 acres) is a commercial cow/calf operation. The Round Valley Ranch is broadly distributed across several different locations within the Owens Valley. In the Big Pine area, the lease consists of 13 separate pastures. The southernmost pasture lies on the east side of the Owens River and extends from Tinemaha Reservoir, on the south, to U.S. Highway 168, on the north. On the east side of the Owens River, the lease extends from north of Steward Lane to north of Klondike Lake. The Round Valley portion of the ranch, approximately eight miles northwest of Bishop, consists of 22 pastures/fields. The Buttermilk portion of the ranch lies approximately eight miles west of Bishop, and consists of eight pastures/fields.

There are five pastures on the Round Valley Ranch lease within the MORP boundary. The East Side Riparian, East Side River Field, Hole Pasture, River Pasture, Zurich Riparian all of which are located in the Big Pine portion of the lease.

The following tables present the summarized utilization data for each field/pasture, and the transects in each field.

Table 7. 19 Grazing Utilization for Fields/Pastures on the Round Valley Lease, RLI-483, 2007-14

Fields/Pastures	2007	2008	2009	2010	2011	2012	2013	2014
***East Side Riparian**	85%	51%	76%	17%	14%	28%	0%	5%
***East Side River Field**	75%	30%	46%	17%	44%	30%	14%	0%
***Hole Pasture**	25%	65%	79%	63%	61%	56%	47%	0%
***River Riparian**	60%	32%	72%	29%	16%	20%	17%	19%
***Zurich Riparian**	56%	51%	27%	20%	6%	18%	16%	31%
Riparian Utilization, 40%								

Table 7. 20 Grazing Utilization for Transects on the Round Valley Lease, RLI-483, 2007-14

Fields/Pastures	Transect	2007	2008	2009	2010	2011	2012	2013	2014
***East Side Riparian**	MEND_04	67%	68%	75%	19%	14%	28%	0%	5%
***East Side River Field**	MEND_05	96%	43%	76%	17%	0%	0%	0%	0%
	MEND_06	77%	27%	73%	20%	46%	62%	29%	0%
	MEND_07	72%	52%	52%	15%	40%	12%	26%	0%
	MEND_08	75%	16%	15%	0%	47%	17%	0%	0%
***Hole Pasture**	MEND_12	25%	65%	67%	50%	61%	56%	47%	0%
***River Riparian**	MEND_03	68%	72%	79%	33%	53%	51%	28%	30%
	MEND_09	0%	9%	10%	0%	0%	2%	6%	6%
	MEND_10	0%	14%	41%	0%	3%	0%	33%	15%
	MEND_11	67%	42%	94%	29%	15%	25%	0%	24%
***Zurich Riparian**	MEND_04	56%	51%	27%	20%	33%	18%	16%	31%
Riparian Utilization, 40%									

Summary of Utilization

In 2009, a new ranch manager took over managing the lease for the lessee, and has consistently worked with Watershed Resources staff to decrease utilization. In 2010, the Hole Pasture was the only pasture over the riparian utilization standard. Since that time the duration of grazing in the Hole Pasture has been decreased to only 5 days or it isn't grazed at all.

The completion of the new riparian fencing north of Highway 168, has allowed the manager to control grazing intensity and cattle distribution more effectively. In turn, utilization scores have decreased and are expected to remain within the current riparian standard of 40%. No management changes are recommended for the lease.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 21 Irrigated Pasture Condition Scores Round Valley Ranch, RLI-483, 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
Big Stockley	80	86	92	88	X	X	90	X
Heifer	82	X	94	92	X	X	88	X
Little Stockley	82	X	94	86	X	X	90	X
Outside	82	X	90	88	X	X	90	X
Sheep	90	X	94	92	X	X	92	X
Bull	88	X	92	88	X	X	90	X
Horse	88	X	90	70	X	X	94	X
Triangle	86	X	92	90	X	X	90	X
Georges	86	X	96	86	X	X	90	X
40 Acre	82	88	88	90	X	X	88	X
Freeway	84	84	94	88	X	X	90	X
Tonys	88	X	86	86	X	X	94	X
Rock House	82	X	90	90	X	X	94	X
Steer	86	X	90	92	X	X	90	X
Canal Pasture	X	X	X	82	X	X	88	X
Hole Pasture	X	X	X	82	X	X	88	X
Little Pasture	X	X	X	78	X	X	88	X
Wells Pasture	80	X	X	86	X	X	90	X
McGee Pasture	81	X	X	88	X	X	90	X
Birch Pasture	80	X	X	88	X	X	88	X
Horse Pasture	80	X	X	86	X	X	88	X

X indicates no evaluation made

<ins>Summary of Irrigated Pastures</ins>

All irrigated pastures on the lease have rated well above 80%. There is no management changes recommended for the lease.

Range Trend

River Riparian

MEND_09 is located on a torrifluvent Saline Meadow. Sampling in 2014 compared to the two prior events (2007, 2009) point towards a decrease in plant frequencies with a decline in Wiregrass and Beardless wildrye, and Clustered goldenweed (*Pyrrocoma racemosa)*.

MEND_10 is located in a moist flood plain ecological site. Trends have remained static through all three sampling events (2007, 2009, and 2014).

MEND_03 is located in a moist flood plain ecological site. Trends have remained static through all three sampling events (2007, 2009, and 2014).

Hole Pasture

MEND_12 is located in a moist flood plain ecological site. Trends have remained static through all three sampling events (2007, 2009, and 2014).

Little Pasture

MEND_02 is located in a moist flood plain ecological site. Trends have remained relatively static through all three sampling events (2007, 2009, and 2014). Alkali sacaton has fluctuated with its lowest value in 2009 and highest value in 2014.

Zurich Riparian

Mend_04 is located in a moist flood plain ecological site. Saltgrass has remained virtually unchanged through all three sampling periods. Beardless wildrye, always at trace levels on the site did decrease significantly in 2014.

East Side Riparian

MEND_05 is located in a moist flood plain ecological site. Saltgrass continued to drop significantly on the transect to levels lower than what was observed in 2007 and 2009.

East Side River Field

MEND_06 is on a Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, moist flood plain ecological site, situated in the East Side River Field. Alkali sacaton increased in 2009 and 2014 when compared to 2007.

MEND_07 is on a Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, moist flood plain ecological site, situated in the East Side River Field. In 2014 saltgrass significantly decreased beyond previously observed levels.

MEND_08 is located on the Winterton-Hessica Complex, 0-2% slopes, situated on a Saline Bottom ecological site. Similar to many other sites, Bassia increased substantially in response to the above average winter of 2009. All other plant frequencies have remained static.

Stockwater Sites

One new stockwater well will be drilled in 2015 in the East Side River Field. This well will help improve livestock distribution and relieve grazing pressure from the riparian area during the spring months. All other stockwater on the lease is provided by the Owens River, creeks or irrigation ditches.

Fencing

A new 4.5 mile long riparian fence was constructed in March of 2011. The fence begins just north of Highway 168, and ties into the existing fence line boundary for the Big Pine canal and Round Valley Ranch leases. This fence will allow the lessee to better control cattle movement and improve grazing uniformity. It will also create two new riparian pastures along the Owens River.

Salt and Supplement Sites

Hay and Protein supplement tubs are used during the winter. Supplement sites are rotated regularly to improve livestock distribution and reduce impacts to supplement sites.

7.3.2.14. Big Pine Canal Lease (RLI-438)

The Big Pine Canal Lease (9,441 acres) is made up of the Canal and Coyote Mountain Parcels. The Canal Parcel (9,084 acres) lies south of the city of Bishop, along U.S. Highway 395. The Coyote Flat Parcel (357 acres) includes three fields north of Baker Creek that are surrounded by Forest Service land. The livestock operation is a cow/calf operation.

The following tables present the summarized utilization data for each field/pasture, and the transects in each field.

Table 7. 22 Grazing Utilization for Fields on the Big Pine Canal Lease, RLI-438, 2007-14

Fields	2007	2008	2009	2010	2011	2012	2013	2014
***North 40**	85%	41%	52%	24%	24%	37%	29%	30%
***South 40**	75%	25%	25%	17%	0%	19%	17%	17%
****Riparian Utilization, 40%***								

Table 7. 23 Grazing Utilization for Transects on the Big Pine Canal Lease, RLI-438, 2007-14

Fields	Transect	2007	2008	2009	2010	2011	2012	2013	2014
***North 40**	YRIB_04	84%	41%	52%	34%	37%	28%	23%	33%
	YRIB_03	91%	36%	62%	47%	0%	0%	33%	23%
	YRIB_06					10%	46%	30%	30%
***South 40**	YRIB_01	65%	13%	20%	11%	0%	28%	26%	26%
	YRIB_02	76%	32%	59%	69%	0%	10%	9%	9%
	YRIB_05	0%	0%	0%	14%	0%	0%	17%	17%

Riparian Utilization, 40%

Summary of Utilization

Since 2007 the lessee has been working to lower grazing utilization in both the North and South 40 fields. Each grazing season has improved except for the North 40 in 2009. Utilization was high at YRIB_04 because a temporary exclosure was built directly next to the transect. This created a fence effect that increase utilization. In 2010 YRIB_04 was moved to a new location, also an additional transect in the North 40 Field was added YRIB_6. Utilization was within the riparian standards in 2014.

Range Trend

North 40

YRIB_04 is on a Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, moist flood plain ecological site, situated in the North 40 pasture. Wiregrass significantly declined on this site in 2014.

YRIB_06 is located on a Torrifluvents, 0-2% slopes soil unit, on a Saline Meadow ecological site in the North 40 pasture. This is a new site, established in 2013 and read only once.

South 40

YRIB_03 is on a Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, moist flood plain ecological site, situated in the South 40 pasture. Saltgrass frequency increased significantly over the last two sampling periods when compared to 2007.

YRIB_01 is located on a Torrifluvents, 0-2% slopes soil unit, on a Saline Meadow ecological site in the South 40 pasture. Saltgrass declined in 2013 when compared to 2010 but changed little compared to 2007 and 2009.

YRIB_05 is located on a Torrifluvents, 0-2% slopes soil unit, on a Saline Meadow ecological site in the South 40 pasture. The site has remained relatively static with the exception of a spike in annual forbs responding to above average precipitation during the winter of 2010.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 24 Irrigated Pasture Condition Scores Big Pine Canal Ranch RLI-438, 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
Alfalfa 2	96	X	X	96	X	X	78	X
Alfalfa 1	94	X	X	96	X	X	91	X
Alfalfa 3	92	X	X	94	X	X	91	X
Heifer	94	X	X	98	X	X	94	X
South Meadow	90	X	X	100	X	X	96	X
Horse Pasture	94	X	X	94	X	X	90	X
4C	96	X	X	96	X	X	98	X
Canal	100	X	X	98	X	X	94	X
Baker	X	98	96	X	X	X	80	X
Sanger Meadow	X	98	96	X	X	X	X	X
Cow Creek	X	98	96	X	X	X	X	X

X indicates no evaluation made

Summary of Irrigated Pastures

All irrigated pastures on the lease have rated well. Sanger and Cow Creek meadows were not rated in 2013 due to drought conditions. Sanger and Cow Creek are high altitude meadows located on the Coyote flat and irrigation water comes from spring flow and snow melt due to drought conditions spring production has decreased reducing available water. No management changes are planned for the lease.

Stockwater Sites

One stockwater well is located in the Horse Field and provides water for the Old Bull, North 40 and Horse Fields.

Fencing

No new fencing projects are planned for the lease besides normal maintenance.

Salt and Supplement Sites

Hay and mineral supplement are fed during the winter months. Supplemental feeding sites are rotated regularly to improve livestock distribution and reduce impacts to supplement sites.

7.3.2.15. Cashbaugh Ranch Lease (RLI-411)

The Cashbaugh Ranch Lease (23,602 acres) is located around the eastern edges of Bishop, extending south to Big Pine on the east side of the Owens River. The lease is a commercial cow/calf operation.

The following tables present the summarized utilization data for each field/pasture, and the transects in each field.

Table 7. 25 Grazing Utilization for Fields on the Cashbaugh Ranch Lease, RLI-411, 2007-14

Fields	2007	2008	2009	2010	2011	2012	2013	2014
*Bishop Creek Field	26%	37%	23%	23	15%	22%	29%	25%
*Ears Field	0%	4%	1%	0%	0%	4%	4%	0%
*East of River Field	63%	0%	26%	15	25%	38%	54%	23%
*Laws River Field	34%	18%	18	20%	25%	47%	45%	25%
*Slough Field	35%	10%	35%	15%	25%	29%	15%	19%
*Warm Springs Holding Field	81%	60%	76%	50%	77%	55%	5%	32%
*White Mountain Field	41%	50%	16%	21%	18%	42%	42%	39%
**Riparian Utilization, 40%*								

Table 7. 26 Grazing Utilization for Transects on the Cashbaugh Ranch Lease, RLI-411, 2007-14

Fields	Transect	2007	2008	2009	2010	2011	2012	2013	2014
***Bishop Creek Field**	CASHBA_02	14%	20%	2%	0%	11%	11%	10%	1%
	CASHBA_04	0%	75%	59%	51%	37%	53%	81%	74%
	CASHBA_05	44%	47%	1%	13%	0%	14%	27%	10%
	CASHBA_06	41%	46%	21%	12%	0%	14%	12%	41%
	CASHBA_09	10%	16%	33%	20%	26%	16%	17%	0%
***Ears Field**	CASHBA_19	0%	2%	0%	0%	0%	0%	0%	0%
	CASHBA_20	0%	7%	0%	0%	0%	0%	0%	0%
	CASHBA_21	0%	5%	4%	0%	0%	15%	0%	0%
	CASHBA_22	0%	0%	0%	0%	0%	0%	0%	0%
	CAHSBA_25	0%	0%	0%	0%	0%	0%	16%	0%
***East of the River Field**	CASHBA_16	59%	0%	21%	21%	24%	28%	20%	7%
	CASHBA_24	67%	0%	31%	10%	43%	38%	49%	62%
***Laws River Field**	CASHBA_01	16%	14%	8%	12%	22%	44%	50%	31%
	CASHBA_03	66%	15%	46%	44%	49%	66%	56%	48%
	CASHBA_07	27%	33%	0%	0%	15%	47%	31%	6%
	CASHBA_08	36%	16%	5%	9%	14%	31%	43%	14%
***Slough Field**	CASHBA_17	38%	15%	42%	0%	20%	19%	25%	31%
	CASHBA_18	32%	6%	34%	17%	25%	39%	15%	12%
	CASHBA_23	35%	11%	27%	0%	32%	30%	6%	15%
***Warm Spring Holding**	CASHBA_15	81%	60%	76%	50%	77%	55%	5%	32%
***White Mountain Field**	CASHBA_12	53%	50%	17	26%	0%	55%	64%	53%
	CASHBA_14	24%	50%	15%	15%	18%	29%	21%	24%

Riparian Utilization

Summary of Utilization

Utilization on the Cashbaugh Ranch has been moderate and within riparian standards. The Laws River Field has increased in overall utilization during the past few years of drought at CASHBA_3. Watershed Resources Staff have been working with the lessee to relieve grazing pressure by moving livestock earlier and reducing numbers. The lessee has tried to improve production by dragging the meadows adjacent to the river and placing supplement further away from the Owens River.

Range Trend

Transects on the Cashbaugh Ranch were sampled in 2007, 2009, 2010, and 2012.

Laws River Field

CASHBA_03 is on a Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, moist flood plain ecological site, situated in the Laws River Field. Saltgrass frequency increased substantially in 2012.

CASHBA_08 is located on a Torrifluvents, 0-2% slopes soil unit, on a Saline Meadow ecological site in the Laws River Field. Frequency appears static during the past three sampling events.

CASHBA_07 is located on a Torrifluvents, 0-2% slopes soil unit, on a Saline Meadow ecological site in the Laws River Field. Plant frequencies remained static over the past four sampling events.

Bishop Creek Field

CASHBA_02 is located on a Torrifluvents, 0-2% slopes soil unit, on a Saline Meadow ecological site in the Bishop Creek Field. Plant frequencies remained static over the past four sampling events.

CASHBA_06 is on a Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, moist flood plain ecological site, situated in the Bishop Creek Field.

CASHBA_04 is located on a Torrifluvents, 0-2% slopes soil unit, on a Saline Meadow ecological site in the Bishop Creek Field. Saltgrass increased significantly in 2012 compared to prior sampling periods. All other plant frequencies remained static.

CASHBA_05 is located on a Torrifluvents, 0-2% slopes soil unit, on a Saline Meadow ecological site in the Bishop Creek Field. Saltgrass significantly dropped in 2012 while alkali sacaton remained high when compared to the first sampling event.

CASHBA_09 is on a Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, moist flood plain ecological site, situated in the Bishop Creek Field. Saltgrass increased to its highest levels while sacaton decreased to levels similar to what was observed in 2007.

White Mountain Field

CASHBA_14 is on a Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, moist flood plain ecological site, situated in the White Mountain Field. Plant trends have remained static on the site.

CASHBA_12 is on a Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, moist flood plain ecological site, situated in the White Mountain Field. Saltgrass increased in 2012 but remains within previously sampled parameters.

Warm Springs Holding Field

CASHBA_15 is on a Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, moist flood plain ecological site, situated in the Warm Springs Holding Field. Despite heavy utilization in the pasture the plant community has now trended down.

Slough Pasture

CASHBA_18 is on a Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, moist flood plain ecological site, situated in the Slough Pasture. Two key forage species, Saltgrass and Alkali sacaton declined dramatically in 2012.

CASHBA_23 is on a Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, moist flood plain ecological site, situated in the Slough Pasture. The site has remained static.

CASHBA_17 is on a Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, moist flood plain ecological site, situated in the Slough Pasture. The site has remained static.

East of the River Field

CASHBA_16 is located on the NUMU Loam, 0-2% slopes soil series which corresponds to a Saline Bottom ecological site in the East of the River Field. Alkali sacaton decreased significantly when compared to all prior years.

CASHBA_24 is on a Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, moist flood plain ecological site, situated in the East of the River Field. Saltgrass significantly increased in 2012 while the remaining plants were static.

Warm Springs Pasture

CASHBA_25 is located on the NUMU Loam, 0-2% slopes soil series which corresponds to a Saline Bottom ecological site in the Warm Springs Pasture. Both in 2010 and 2012 Alkali sacaton was remained lower than frequency levels observed in 2009. All other species have been stable, aside from annuals increasing during the wet year of 2010.

Ears Field

CASHBA_19 is located on the NUMU Loam, 0-2% slopes soil series which corresponds to a Saline Bottom ecological site in the Ears Field.

CASHBA_20 is located on the NUMU Loam, 0-2% slopes soil series which corresponds to a Saline Bottom ecological site in the Ears Field. All species have been stable, aside from annuals increasing during the wet year of 2010.

CASHBA_21 is located on the NUMU Loam, 0-2% slopes soil series which corresponds to a Saline Bottom ecological site in the Ears Field.

CASHBA_22 is located on the NUMU Loam, 0-2% slopes soil series which corresponds to a Saline Bottom ecological site in the Ears Field. Species have been static over the last four sampling periods.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 27. Irrigated Pasture Condition Scores Cashbaugh Ranch 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
Bull Pasture	92	X	X	96	X	X	94	X
Horse Pasture	80	X	X	96	X	X	94	X
Old Bull Pasture	92	X	X	90	X	X	96	X
Lower Pasture	90	X	X	98	X	X	94	X
Middle Pasture	92	X	X	98	X	X	94	X
Upper Pasture	92	X	X	96	X	X	94	X
Sheep Pasture	86	X	X	92	X	X	84	X
Winter Pasture	82	X	X	82	X	X	80	X
Lake Pasture	86	X	X	86	X	X	80	X
Williams Pasture	82	X	X	88	X	X	84	X
Symons Pasture	X	X	90	86	X	X	96	X

X indicates no evaluation made

Summary of Irrigated Pastures

All irrigated pastures on the lease have rated well for the past four years. No management changes are planned for the lease.

Stockwater Sites

Three stockwater wells were drilled in 2011. One well site is located east of the Owens River off of Warm Springs Road in the East of the River Field. The second well site is located east of Laws Poleta Road in the Corral Field and the third well was drilled east of the river in the Ears Field. All wells have been equipped with troughs and are being used. The Poleta Well is currently being augmented by the Upper McNally Canal because it cannot keep up with the demand from the cattle in the field. A new well was drilled in 2013 just east of Laws Poleta Road about a mile west of the existing well; it will be fitted in 2015.

Fencing

A cross fence was repaired and two cattle guards were installed on the lease in 2011. No other fencing projects are scheduled for the lease beyond general maintenance.

Salt and Supplement Sites

Hay and Protein supplement tubs are fed during the winter months. Supplemental feeding sites are rotated regularly to improve livestock distribution and reduce impacts to supplement sites.

7.3.2.16. Warm Springs Ranch Lease (RLI-497)

The Warm Springs Lease (4,161 acres) lies southeast of Bishop, north of Warm Springs Road, between U.S. Highway 395 and the Owens River. The ranch operates a commercial cow/calf operation.

The following tables present the summarized utilization data for each field/pasture, and the transects in each field.

Table 7. 28 Grazing Utilization for Fields/Pastures on the Warm Springs Lease, RLI-497, 2007-14

Fields/Pastures	2007	2008	2009	2010	2011	2012	2013	2014
River Field	22%	23%	12%	0%	11%	29%	37%	30%
White Mountain Field	38%	50%	16%	21%	18%	42%	43%	39%
Riparian Utilization, 40%								

Table 7. 29 Grazing Utilization for Transects on the Warm Springs Ranch Lease, RLI-497, 2007-14

Fields/Pastures	Transects	2007	2008	2009	2010	2011	2012	2013	2014
River Field	CASHBA_10	0%	23%	14%	0%	25%	32%	48%	53%
	CASHBA_11	16%	33%	5%	0%	0%	21%	22%	6%
	CASHBA_13	7%	15%	20%	0%	7%	34%	41%	30%
White Mountain Field	CASHBA_12	53%	50%	17%	26%	0%	55%	64%	53%
	CASHBA_14	24%	50%	15%	15%	18%	29%	21%	24%
Riparian Utilization, 40%									

Summary of Utilization

Utilization for the River Field has been minimal every year except for 2013. Use increased mostly due to drought conditions. The lessee has since destocked as a result of the persisting drought in 2014. There are currently no plans to change management.

Range Trend

River Field

CASHBA_11 is located on the Torrifluvents, 0-2% slopes soil series which corresponds to a Saline Meadow ecological site in the River Field. There were no statistically significant changes in frequency between 2007 and 2009.

CASHBA_10

CASHBA_10 is on a Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, moist flood plain ecological site, situated in the River Field. There were no statistically significant changes in frequency between 2007 and 2009.

CASHBA_13 is on a Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, moist flood plain ecological site, situated in the River Field. There were no statistically significant changes in frequency between 2007 and 2009.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 30 Irrigated Pasture Condition Scores Warm Springs Ranch Lease RLI-497, 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
Watterson North	90	X	X	94	X	X	96	X
Watterson South	86	X	X	84	X	X	96	X
Calving Pasture	86	X	78	X	X	X	86	X
New Alfalfa	X	80	70	X	X	X	82	X
Old Alfalfa	X	80	78	X	X	X	82	X

X indicates no evaluation made

Summary of Irrigated Pastures

The Watterson North and South pastures have rated well since 2007. The Calving, New Alfalfa, and Old Alfalfa pastures were rated low but have improved. Improvements have been due to repaired irrigation diversions on the lease allowing more efficient water use by the lessee.

Stockwater Sites

One new stockwater well has been drilled in 2014; it is located east of Warm Springs road on the uplands. It should help pull livestock away from the riparian areas in the spring months.

Fencing

There is no fencing projects planned for the lease beyond general maintenance.

Salt and Supplement Sites

Cottonseed meal and protein supplement tubs are fed during the winter months at rotated supplement sites.

7.3.2.17. Reinhackle Ranch Lease (RLI-492)

The Reinhackle Ranch Lease (5,947 acres) consists of three separate parcels: the Reinhackle Place, which lies to the east of Bishop and south of U.S. Highway 395; the Five Bridges Parcel, which is north of Bishop and west of Five Bridges Road; and the Laws Parcel, which lies west of U.S. Highway 6 and east of Five Bridges Road.

The following tables present the summarized utilization data for each pasture, for the transects in each field.

Table 7. 31 Grazing Utilization for Fields/Pastures on the Reinhackle Ranch Lease, RLI-492, 2007-14

Fields/Pastures	2007	2008	2009	2010	2011	2012	2013	2014
Laws Holding Field	33%	34%	35%	45%	25%	39%	33%	49%
Laws Holding Riparian*					8%	19%	38%	26%
Triangle Field*	32%	14%	36%	34%	37%	46%	43%	20%
Riparian Utilization, 40%								

Table 7. 32 Grazing Utilization for Transects on the Reinhackle Ranch Lease, RLI-492 ,2007-14

Fields/Pastures	Transects	2007	2008	2009	2010	2011	2012	2013	2014
Laws Holding Field	LACEY_03	0%	0%	32%	37%	5%	34%	27%	41%
	LACEY_05	27%	45%	40%	52%	62%	65%	35%	79%
Laws Holding Riparian*	LACEY_08					8%	19%	38%	26%
Triangle Field*	LACEY_01	23%	4%	56%	33%	41%	79%	56%	38%
	LACEY_02	24%	16%	50%	33%	19%	35%	41%	0%
	LACEY_04	0%	13%	17%	0%	34%	21%	0%	0%
	LACEY_06	48%	19%	25%	0%	26%	62%	50%	29%
	LACEY_07	0%	0%	41%	39%	65%	31%	65%	23%

Riparian Utilization,40%

Summary of Utilization

A new riparian fence was constructed in 2010 creating the Laws Holding Riparian Field. Utilization in the Laws Holding Riparian Field has been below the allowable utilization standard of 40%. The Triangle has steadily increased utilization and exceeded 40% over the years. This is mostly due to livestock crossing the river from the north. Grazing is better in the south portion of the Triangle Field, and low winter flows in the Owens River allow livestock to cross easily. Supplement and a change in field rotation are going to be tried by the lessee to lower the utilization in the Triangle Field.

Range Trend

Triangle Field

LACEY_02 is on a Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, moist flood plain ecological site, situated in the Triangle Field. Saltgrass decreased significantly on LACEY_02 while Alkali sacaton significantly increased in 2013.

LACEY_04 is on a Torrifluvents 0-2% slopes, Saline meadow ecological site, situated in the Triangle Field.

Laws Holding Riparian

LACEY_08 is on a Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, moist flood plain ecological site, situated in the Laws Holding Riparian field.

River Field

LACEY_03 is on a Torrifluvents 0-2% slopes, Saline meadow ecological site, situated in the River Field. Saltgrass has decreased significantly on this site in 2013.

LACEY_05 is on a Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, moist flood plain ecological site, situated in the River Field. Trends across the three years appear static.

LACEY_06 is on a Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, moist flood plain ecological site, situated in the River Field. Trends across the three years appear static.

LACEY_07 is on a Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, moist flood plain ecological site, situated in the River Field. Trends across the three years appear static.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 33 Irrigated Pasture Condition Scores Reinhackle Ranch 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
South Pasture	80	74	74	92	X	X	86	X
West Pasture	86	74	X	90	X	X	86	X
East Pasture	80	X	X	94	X	X	86	X
Horse Pasture	82	X	66	86	X	X	72	74

X indicates no evaluation made

Summary of Irrigated Pastures

Irrigation on the lease has improved due to a new irrigation schedule. However, the Horse Pasture has remained consistently low due to invasive weeds and over grazing. The lessee is in the process of making management changes to improve the condition of the Horse Pasture. A small improvement was made in the Horse Pasture condition in 2015, with a normal irrigation season it should improve more.

Stockwater Sites

Two stockwater wells were drilled in 2011. The wells are located in the Laws area one supplying the Holding Field and the other just north of the Lower McNally Canal to supply water for spring grazing and to remove grazing pressure from the Owens River.

Fencing

There are no fence projects planned for the lease other than general maintenance.

Salt and Supplement Sites

Portable liquid supplement stations are used during the winter. These stations are placed in designated areas outside the riparian corridor and are periodically moved.

7.3.2.18. Four J Cattle Ranch Lease (RLI-491 and 499)

The 4-J Ranch Lease consists of two different ranches. The Big Pine Ranch (RLI-491) contains approximately 10,764 acres, (9,567 acres are covered by this plan) and is located near the community of Big Pine. The Laws Ranch (RLI-499) contains approximately 1,197 acres and lies north of Laws, between U.S. Highway 6 and the Upper McNally Canal. The 4-J Ranch Lease is owned by the 4-J Cattle Corporation and managed by Mr. Mark Johns. In addition to this lease, the lessee holds the Big Pine lease (RLI-491) which is comprised of the Baker Creek area near Big Pine and the Twin Lakes area near Blackrock. The majority of the mature breeding cattle graze in the Owens Valley in winter and summer in Long Valley. However, there are small herds that graze the Laws Ranch, Baker Creek Ranch periodically throughout the year. Cattle that graze on the Long Valley and Baker Creek leases also utilize adjacent Federal grazing allotments.

The Big Pine portion of the Lease consists of irrigated pastures with the surrounding fields being a mix of native Alkali sacaton meadows and dry uplands in the Twin Lakes portion of the lease. Cattle typically graze the Ranch from late October to early May. The duration of grazing may vary from year to year dependent upon forage conditions in Long Valley. During the grazing season cattle are moved using the best pasture rotation strategy.

The Laws Ranch consists entirely of irrigated pastures. Cattle graze the ranch on a year round basis under various stocking rates that are dependent upon available forage.

All grazing on the lease occurs on irrigated pastures or federal grazing allotments so no utilization data is collected. The Twin Lakes portion of the lease is part of the LORP and all grazing monitoring results are contained in the LORP Annual Report.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 34 Irrigated Pasture Condition Scores Four J Cattle Ranch 2007-14

RLI- 491 Pastures	2007	2008	2009	2010	2011	2012	2013	2014
Front Pasture	81	86	X	90	X	X	80	X
Triangle Pasture	84	X	X	88	X	X	72	68
Holding Pasture	90	X	X	98	X	X	90	X
Hessian Pasture	84	X	X	84	X	X	76	70
Fish Springs	86	X	X	90	X	X	94	X
Tinemaha Pasture	86	X	X	84	X	X	94	X
Baker Meadow	98	X	X	94	X	X	90	X
Cottonwood Meadow	86	X	X	90	X	X	94	X
Silver Canyon Pasture	86	X	X	86	X	X	94	X
Middle Pasture	90	X	X	88	X	X	94	X
Jean Blank Pasture	84	X	X	88	X	X	96	X
RLI- 499 Pastures	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Wiper Pivots Pasture	94	X	X	98	X	X	96	X
Full North Pivot	88	X	X	90	X	X	96	X
Full South Pivot	88	X	X	86	X	X	96	X
Mitigation Pasture	84	X	X	86	X	X	96	X

X indicates no evaluation made

Summary of Irrigated Pastures

Irrigated pastures on the lease have scored well in the past. However, drought conditions have decreased the amount irrigation water provided by Big Pine and Baker Creeks and the Hessian and Triangle pastures have declined in condition. With normal irrigation the pastures should improve condition. No management changes are recommended for the lease.

Stockwater Sites

All stockwater is provided by irrigation diversions, Big Pine Canal or troughs.

Fencing

No fencing is planned on the lease beyond general maintenance.

Salt and Supplement Sites

Hay and liquid supplement are used during the winter.

7.3.2.19. Independence Ranch Lease (RLI-454)

The Independence Lease (5,437 acres) consists of the Big Pine, Springfields, and Shepherds Creek Parcels. The Big Pine Parcel (5,087 acres) consists of 12 irrigated pastures, 4 of which are used for hay production. The Springfields Parcel (4,674 acres) consists of 13 pastures (plus a county landfill, several revegetation sites, and livestock corrals) east of U.S. Highway 395 and west of the Los Angeles Aqueduct near the town of Independence. The Shepherds Creek Parcel (315 acres) is an irrigated alfalfa field and hay yard west of U.S. Highway 395 and north of the Manzanar National Monument.

The following tables present the summarized utilization data for each field/pasture, and the transects in each field.

Table 7. 35 Grazing Utilization for Independence Ranch Lease, RLI-454, 2007-14

Field	2007	2008	2009	2010	2011	2012	2013	2014
***South River Field**	0%	14%	17%	15%	46%	30%	46%	14%
****Riparian Utilization, 40%***								

Table 7. 36 Grazing Utilization for Transects on the Independence Ranch Lease, RLI-454, 2007-14

Field	Transect	2007	2008	2009	2010	2011	2012	2013	2014
***South River Field**	4J_02	0%	18%	25%	15%	0%	61%	0%	26%
	4J_03	0%	10%	9%	0%	31%	6%	28%	7%
	4J_04	0%	10%	17%	16%	61%	24%	64%	9%
****Riparian Utilization, 40%***									

Summary of Utilization

Utilization has increase in the South River Field mainly due to a change in management in 2010. The utilization increased under the new lessee and was over utilization for several years. Since 2010 the lessee has been working with Watershed Resources staff to decrease utilization. Faster pasture rotation along with changing the timing of the grazing has resulted in 2014 utilization in the South River Field of 14%, and all livestock have been moved for the rest of the grazing season. There will be no further management changes.

Range Trend

South River Field

4J_02 is on a Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, moist flood plain ecological site, situated in the South River Field. Trends across the three years appear static.

4J_03 is on a Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, moist flood plain ecological site, situated in the South River Field.

4J_04 is on a Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, moist flood plain ecological site, situated in the South River Field. Saltgrass increased significantly between 2010 and 2012. All other species remained static.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 37 Irrigated Pasture Condition Scores Independence Ranch 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
Pasture 1	84	X	X	96	X	X	86	X
Pasture 2	84	X	X	92	X	X	86	X
Pasture 3	96	X	X	84	X	X	84	X
South Pasture	88	X	X	94	X	X	94	X
Horse Field	90	X	X	90	X	X	94	X
Elk Field	82	X	X	90	X	X	86	X
North Feedlot	84	X	X	98	X	X	94	X
NW Feedlot	90	X	X	92	X	X	94	X
Stewart Wiper	X	Planted	X	92	X	X	100	X

X indicates no evaluation made

Summary Irrigated Pastures

All irrigated pastures on the lease are doing well regardless of drought conditions. This is the result of irrigation water that is provided by the Big Pine Canal. Not having to rely on perennial stream flow for irrigation, has helped maintain good conditions on these pastures.

Stockwater Sites

Stockwater is provided by irrigation diversions or the Owens River.

Fencing

No fencing projects are planned beyond normal maintenance.

Salt and Supplement Sites

Cake blocks that contain trace minerals and protein are distributed for supplement on the lease.

7.3.2.20. Rockin DM Ranch Lease (RLI-420)

The 110-acre Rockin DM Ranch Lease west, of Big Pine is a cow/calf operation in Big Pine. Only a portion of the grazing for the entire ranch occurs on City property. This part of the ranch is irrigated and is the location of the ranch headquarters. The LADWP portion of the ranch is located on the south side of the Baker Creek Road, and is comprised of irrigated pasture and dry grazing all located within the same pasture.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 38 Irrigated Pasture Condition Scores Rockin DM Ranch 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
Whistler	70	82	X	86	X	X	80	X

X indicates no evaluation made

Summary of Irrigated Pastures

The irrigated pasture on the lease has improved slightly since 2007. Lack of forage on the Inyo County portion of the ranch has increased grazing pressure on the Whistler Pasture for the last year. Along with drought conditions, the lessee has had to decrease cattle numbers.

7.3.2.21. Baker Road Ranch Lease (RLI-475)

The Baker Road Ranch Lease is managed in conjunction with the lessee’s other LADWP ranch leases in the LORP project area. The lease grazes horses and mules that are used in a commercial packer operation. The Baker Road Ranch Lease (680 acres) is comprised of four irrigated pastures and two mountain meadows. The 185-acre Intake Pasture lies to the west of the Owens River and the LAA at the Intake. The 104-acre Big Meadow Pasture lies to the east of the Owens River, north of the Intake and east of the LAA below the Intake. The remaining 495-acre Baker Road Ranch portion is located in Big Pine, Fuller, and Saulk Meadows. The Big Pine portion of the lease is comprised of five irrigated pastures that are grazed during the winter months. The Fuller and Saulk portions of the lease are located at the base of Kid and

Birch Mountain's and are naturally irrigated by annual spring flows. These meadows are also grazed by pack stock during the summer.

The following tables present the summarized utilization data for each field/pasture, and the transects in each field.

Table 7. 39 Grazing Utilization for Fields/Pastures on the Baker Road Ranch Lease, RLI-475, 2007-14

Fields/Pastures	2007	2008	2009	2010	2011	2012	2013	2014
***Intake Field**	15%	0%	20%	20%	28%	0%	0%	10%
Riparian Utilization, 40%								

Table 7. 40 Grazing Utilization for Transects on the Baker Road Ranch Lease, RLI-475, 2007-14

Fields/Pastures	Transects	2007	2008	2009	2010	2011	2012	2013	2014
***Intake Field**	Stewart_01	15%	0%	20%	20%	28%	0%	0%	10%
Riparian Utilization, 40%									

Summary of Utilization

Utilization on the Intake portion of the Baker Road Ranch has been well below the allowable riparian utilization standard of 40%. There will be no management changes on the lease.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 41 Irrigated Pasture Condition Scores Baker Road Ranch 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
North H Way	88	X	X	84	X	X	88	X
South H Way	88	X	X	88	X	X	88	X
West County	80	X	X	92	X	X	88	X
East County	80	X	X	98	X	X	88	X
West Poplar	80	X	X	92	X	X	88	X
East Poplar	78	X	X	90	X	X	88	X
Fuller Meadow	92	X	X	86	X	X	94	X
Saulk Meadow	X	X	X	X	X	X	X	X

X indicates no evaluation made

Summary of Irrigated Pastures

All irrigated pastures on the lease have remained in good condition since 2007. The Saulk Meadow has not been rated for several years due to lack of irrigation due to drought conditions. Improved precipitation in the future will allow for more spring output and better irrigation. There are no management changes recommended for the lease.

Stockwater

Stockwater is provided by irrigation diversions, springs and the Owens River on the lease.

Fencing

No fencing projects are scheduled for the lease beyond general maintenance.

Salt and Supplement

No salt supplements are used by the lessee.

7.3.2.22. Aberdeen Pack Lease (RLI-479)

The Aberdeen Lease is used to graze horses and mules used in a commercial packer operation. The lease (3,314 acres) is made up of the Hines Spring and Haystack Parcels. The Bairs Parcel is a use permit and is managed in conjunction with this ranch lease. The Hines Spring Parcel includes the area from the Blackrock Fish Hatchery north to Hines Spring. This is an upland area and utilization is set at 65% for all fields. There are two fields in this portion of the lease. The Haystack Parcel borders the east side of the town of Independence. The Independence sewer treatment facilities border the northeast corner of the parcel. The lessee uses the parcel to raise alfalfa and graze pack stock. There are 16 pastures and operating structures in the parcel.

The following tables present the summarized utilization data for each field/pasture, and the transects in each field.

Table 7. 42 Grazing Utilization for Fields/Pastures on the Aberdeen Ranch Lease, RLI-479, 2007-14

Fields/Pastures	2007	2008	2009	2010	2011	2012	2013	2014
Hines Spring Exclosure	63%	75%	45%	31%	41%	35%	34%	41%
Pipeline Field	4%	19%	19%	14%	26%	39%	50%	21%
Riparian Utilization, 40%								

Table 7. 43 Grazing Utilization for Transects on the Aberdeen Ranch Lease, RLI-479, 2007-14

Fields/Pastures	Transects	2007	2008	2009	2010	2011	2012	2013	2014
Hines Spring Exclosure	ABERDEEN_30	63%	75%	48%	49%	44%	66%	66%	39%
	HINES_SPRING_02	0%	0%	44%	27%	45%	20%	35%	28%
	HINES_SPRING_03	0%	35%	44%	5%	33%	20%	32%	57%
Pipeline Field	ABERDEEN_33	5%	22%	29%	26%	5%	57%	40%	10%
	PIPELINE_02	0%	14%	19%	7%	19%	35%	50%	37%
	PIPELINE_03	0%	14%	23%	0%	13%	26%	51%	15%
Riparian Utilization, 40%									

Summary of Utilization

Utilization on the Aberdeen lease has been maintained at an allowable level since 2007. The only year utilization was over the 65% was 2008. Since that time utilization has been low, with livestock distribution being affected by water spreading from the Hines Spring mitigation project. The increase water spreading has produced more forage for the pack stock and changed the location where they are grazing. Future monitoring may include the addition of several new utilization transects in the new grazing areas if needed.

Range Trend

Range trend transects were read on the Aberdeen Lease seven times (2002-04, 2007, 2009-10, 2012).

Hines Spring Exclosure

ABERDEEN_30 is situated on the Winnedumah Silt Loam 0-2% slopes, which corresponds to a Sodic Fan ecological site. Trends across the seven years appear static.

Pipeline Field

ABERDEEN_33 is on the Pokonahbe Loamy fine Sand, 0-2% slopes which corresponds to the Saline Bottom ecological site. Trends across the seven years appear static.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 44 Irrigated Pasture Condition Scores Aberdeen Ranch Lease RLI-479, 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
One Acre	80	76	84	82	76	90	88	X
North	80	82	X	86	X	X	88	X
Middle	84	92	X	84	X	X	80	X
South	84	96	X	70	X	X	80	X
Hay Stack	84	92	X	86	X	X	88	X

X indicates no evaluation made

Summary of Irrigated Pastures

The irrigated pastures on the Aberdeen lease have varied throughout the years with the scores ranging above and below the allowable standard of 80%. However, for the past several years better management has maintained scores. The 2013 scores dropped due to drought conditions. No management changes are recommended for this lease.

Stockwater Sites

Stock have begun to use the water that is coming from the Hines Spring mitigation project for the past few years. Stock do not have to travel to Aberdeen Ditch in order to get water.

Fencing

An exclosure fence is planned for the Hines Spring mitigation project and should be completed by the end of 2015.

Salt and Supplement Sites

Pack stock is supplemented with hay and trace mineral blocks if needed by the lessee.

7.3.2.23. Coloseum Ranch Lease (RLI-407)

The Coloseum Ranch Lease lies West of Lone Pine in the Alabama hills, and south of the Blackrock Fish Hatchery and Eight Mile Ranch on the west and on the east side of U.S. Highway 395. The ranch grazes horses on the Lone Pine portion of the lease (Movie Field) and cattle on the Blackrock portion of the lease (South East Field). Cattle graze the South East Field in the fall, winter and summer on federal grazing allotments.

The following tables present the summarized utilization data for each field/pasture, and the transects in each field.

Table 7. 45 Grazing Utilization for Fields on the Coloseum Ranch Lease, RLI-407, 2007-13

Fields/Pastures	2007	2008	2009	2010	2011	2012	2013	2014
Movie Field	70%	12%	16%	0%	0%	3%	0%	0%
South East Field	77%	0%	36%	54%	44%	72%	0%	0%
North East Field	72%	7%	29%	38%	32%	48%	40%	0%
****Riparian Utilization, 40%***								

Table 7. 46 Grazing Utilization for Transects on the Coloseum Ranch Lease, RLI-407, 2007-13

Fields/Pastures	Transects	2007	2008	2009	2010	2011	2012	2013	2014
Movie Field	COLOSEUM_01	65%	8%	14%	0%	0%	0%	0%	0%
	COLOSEUM_02	70%	0%	19%	0%	0%	0%	40%	0%
	COLOSEUM_03	74%	29%	16%	0%	0%	0%	0%	0%
South East Field	COLOSEUM_38	77%	0%	9%	0%	0%	70%	0%	0%
	COLOSEUM_T1			20%	42%	42%	40%	0%	0%
	COLOSEUM_T2			69%	40%	58%	74%	0%	0%
	COLOSEUM_T3			32%	39%	25%	79%	0%	0%
	COLOSEUM_T4			45%	62%	57%	64%	0%	0%
	COLOSEUM_T5			39%	85%	51%	0%	0%	0%
North East Field	NORTHEAST_01	72%	7%	29%	38%	32%	48%	0%	0%

Riparian Utilization, 40%

Summary of Utilization

Utilization on the Coloseum has been below the allowable standard of 65% for the past seven years. However for the past few years use has increased in the North and South East Fields due to drought conditions that have decreased forage production on the lessees federal grazing allotments. The lessee has been bringing cattle sooner and leaving them longer increasing utilization. In 2013, cattle arrived during the growing season before ungrazed plant heights where collected. Watershed Resources staff had to estimate utilization for the growing season. The 2014 season for the lease will not be monitored because the lessee has sold all of his livestock.

Range Trend

South East Pasture

Coloseum _38 is located on the Shondow Loam 0-2% slopes soil unit, on a Saline Meadow. The transect is in the South East Pasture in the Sawmill parcels of RLI-407. Trends across the seven year period appear static.

Movie Field

Coloseum_02 is located in the Movie Filed on the Mt. Whitney Parcels of RLI-407. The transect is on a Dehy-Conway-Lubkin association, 0-9% slopes. The site most closely corresponds to a Saline Meadow ecological site. Trends across the six sampling periods have been static.

Irrigated Pastures

There are no irrigated pastures on the Coloseum Ranch Lease.

Stockwater Sites

Stockwater is provided by a diversion coming off Sawmill Creek.

Fencing

No new fencing is planned for the lease beyond normal maintenance.

Salt and Supplement Sites

Hay is fed during the winter, no other supplement is used.

7.3.2.24. Three Corner Round Lease (RLI-464)

The Three-Corner-Round Ranch Lease (1,792 acres) is east of Aberdeen, between new and old U.S. Highway 395, and is leased to the Three-Corner-Round Pack Outfit. The ranch grazes burros that are used during the summer months for youth camp and pack trips in the Sierra Nevada Mountains. The fields consist entirely of upland vegetation.

Summary of Utilization

There are no utilization transects for this lease due the composition of the vegetation. There are no perennial grasses and the bulk of the vegetation is made up of Sage Brush, Nevada Salt Bush and annuals. The burros forage on the shrubs and annuals when available in the spring. If needed they are supplemented with hay during the winter. The lease condition was evaluated in 2014 and was found to be in good condition with current stocking rates.

Fencing

The lessee had a private contractor replace the western boundary fence in 2010. No other fence projects are planned for the lease.

7.3.2.25. Eight Mile Ranch Lease (RLI-408)

The 770-acre Eight-Mile Lease is operated as a commercial packer operation and uses the ranch to graze pack stock during winter and grow alfalfa hay during the summer. The lease is located south of Aberdeen, bordered on the east by U.S. Highway 395. Horses and mules graze the hay stubble in the fall and winter, if precipitation allows spring grazing will occur on the upland portions of the lease. The lease includes a small partially irrigated field (Tree Lot), two small fields (Yearling and Feed Lot) and five large fields (Upper North, Lower North, West, South and Willow Fields) that are not irrigated. A corral and a stock yard complete the lease.

Summary of Utilization

There is no utilization data for the upland fields on the lease as they are recovering from the 2007 Inyo Complex fire. The South Field was partially burned. Utilization transects have been established in the this field, which has perennial grass components and monitoring is planned once grazing resumes.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 47 Irrigated Pasture Condition Scores Eight Mile Ranch, 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
House	84	X	X	80	86	X	84	X

X indicates no evaluation made

Summary of Irrigated Pasture

The House pasture has rated at or just above the allowable standard of 80%. The scores on the pasture could be improved if it was replanted.

Fencing

All of the boundary fences to the west of the lease were burned in 2007. They have been replaced, and no other new fencing projects are planned.

Salt and Supplement

Hay is fed to livestock when needed during the winter months.

7.3.2.26. Fort Independence Ranch Lease (RLI-406,489)

The Fort Independence Lease includes 3,849 acres covered by RLI-406, in conjunction with the Islands (north of Lone Pine); Delta (south of Lone Pine); Georges Creek (northwest of Lone Pine); Archie Adjunct (south of Owens Lake); and Lubkin Adjunct (south of Lone Pine) grazing leases. The livestock program is a commercial cow/calf operation.

The Fort Independence lease is comprised entirely of irrigated pastures and has no grazing utilization transects. The lease is monitored using the irrigated pasture condition scoring.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 48 Irrigated Pasture Condition Scores Fort Independence 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
Zucco	96	X	X	98	X	X	92	X
D&D	96	X	X	96	X	X	92	X
Bardoff	94	X	X	96	X	X	92	X
Plot	100	X	X	100	X	X	96	X
Heifer Heaven	96	X	X	96	X	X	90	X
Garden	94	X	X	96	X	X	90	X
Orchard	100	X	X	100	X	X	82	X
Pampa	96	X	X	100	X	X	90	X
Cane	100	X	X	100	X	X	92	X
L&L	100	X	X	100	X	X	90	X
Willow	94	X	X	100	X	X	84	X
Clover	94	X	X	96	X	X	92	X
Horse Heaven	90	X	X	94	X	X	84	X
Hectare	92	X	X	96	X	X	90	X
Dessert	94	X	X	96	X	X	96	X

X indicates no evaluation made

Summary of Irrigated Pastures

All of the pastures in the Fort are above the minimum irrigated pasture condition score of 80%. The pastures are managed well; the lessee actively sprays and mows weeds and shrubs during the growing season. The species composition of the pastures is high giving variable options for high quality forage for livestock. There will be no management changes recommended for this lease.

Stockwater Sites

Stockwater is provided by irrigation ditches and diversions.

Fencing

No new fencing is planned for this lease beyond general maintenance.

Salt and Supplement Sites

Mineral tubs or cake blocks are used to supplement feed in designated areas.

7.3.2.27. Georges Creek Parcel (RLI-489)

The Georges Creek Parcel (4,000 acres) is a cow/calf operation in conjunction with a surrounding BLM grazing allotment. This parcel borders BLM land to the west, U.S. Highway 395 to the east, the Moffat Ranch to the south, and the Shepherd Creek alfalfa field to the north. The parcel is presently managed as four pastures.

Georges Pastures #1 and #2 are irrigated and the perimeters are fenced. The North Field, north and west of Manzanar, is not fenced separate from BLM lands. This pasture is grazed only in conjunction with the adjacent BLM grazing allotment and has no utilization transects in it. The South Field is located between Moffat Ranch and Georges Creek irrigated pastures. It also borders BLM land and has no fences, so it is managed the same as the North Field. The only portion of the parcel presently fenced is around the irrigated pasture in the center and western edge of the parcel. A small corral near Georges Creek along the west boundary of the parcel is used to work cattle.

The following tables present the summarized utilization data for each field/pasture, and the transects in each field.

Table 7. 49 Grazing Utilization for Fields/Pastures on the Georges Creek Parcel, RLI-489, 2007-14

Fields/Pastures	2007	2008	2009	2010	2011	2012	2013	2014
South Field	43%	26%	6%	6%	12%	7%	6%	0%
Riparian Utilization, 40%								

Table 7. 50 Grazing Utilization for Transects on the Georges Creek Parcel, RLI-489, 2007-14

Fields/Pastures	Transects	2007	2008	2009	2010	2011	2012	2013	2014
South Field	ISLAND_02	40%	15%	8%	0%	24%	19%	10%	0%
	ISLAND_59	74%	47%	18%	0%	23%	10%	14%	0%
	SOUTHFIELD_02	0%	0%	3%	7%	0%	0%	0%	0%
	SOUTHFIELD_03	0%	0%	0%	0%	0%	0%	0%	0%
Riparian Utilization, 40%									

Summary of Utilization

Utilization on the Georges Creek Parcel has been within the upland standard of 65%. As the tables above show grazing has been light to moderate for the past seven years with no changes being recommended in management. If precipitation increases this spring grazing could decrease on the parcel as livestock move up to the adjacent fans to graze on spring annuals or native perennial grasses.

Range Trend

South Field

ISLAND_59 is located in the South Field on the Georges Creek Parcel. The transect is on the Reinhackle Sand, 0-2% slopes which corresponds to a Saline Bottom ecological site. Trends across the four year period appear static.

ISLAND_02 is located in the South Field on a disturbed Dehy-Conway-Lubkin-Association, 0-9% slopes. Because of the complexity of different soil units, ecological sites associated with the unit vary from Wet Meadow, Saline

Meadow, to Gravelly Loamy Sand. The actual site appears to be a xeric oriented Saline Meadow transitioning to a Gravelly Loamy Sand site. Trends across the five year period appear static.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 51 Irrigated Pasture Condition Scores Georges Creek Parcel 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
Olive	88	X	X	88	X	X	82	X
Georges	84	X	X	90	X	X	82	X

X indicates no evaluation made

Summary of Irrigated Pastures

The irrigated pastures on this parcel have been above the minimum score of 80% since the monitoring has started. Score dropped in 2013 due to the drought conditions which affect the water supply to the pastures from Georges Creek. Conditions should improve when a normal irrigation season occurs. Grazing on the irrigated pastures was minimal due to the lack of forage production.

Stockwater Sites

Stockwater is provided by Georges Creek, irrigation ditches and diversions on the lease.

Fencing

There is no fencing planned for the lease beyond general maintenance.

Salt and Supplement Sites

Mineral tubs and cake blocks are used to supplement cattle in designated areas.

7.3.2.28. JR Ranch Lease (RLI-436)

The JR Ranch Lease (976 acres) lies to the north and west of Lone Pine. Until 2001, the lessee grazed 25 cow/calf pairs on the lease. Now, the lessee grazes only horses.

Summary of Utilization

The upland grazing on the lease is currently in non-use, no utilization data is collected.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 52 Irrigated Pasture Condition Scores JR Ranch 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
EM	84	80	68	68	70	90	86	X
Olivia	78	68	62	62	82	88	86	X
Lone Pine	84	78	68	68	74	92	88	X

X indicates no evaluation made

Summary of Irrigated Pastures

The irrigated pastures on this lease have had trouble maintaining the minimum score of 80% for several years. The main reason for the low scores is a lack of irrigation management. For the past few years the lessee has made some changes and the scores have increased above the minimum. This lease will continue to be monitored annually until the scores become stable.

Stockwater Sites

Stockwater is provided by irrigation diversions and troughs.

Fencing

No fencing is planned beyond general maintenance.

Salt and Supplement Sites

Hay is fed during the winter if needed in designated areas.

7.3.2.29. Lone Pine Dairy Lease (RLI-452)

The Lone Pine Dairy Lease (80 acres) is south of Lone Pine, north of the Lone Pine Golf Course, and west of U.S. Highway 395. The Lone Pine Dairy Lease grazes between 35 and 45 purebred Red Angus cows.

Summary of Utilization

The Lone Pine Dairy lease is comprised entirely by irrigated pastures no utilization is measured on the lease.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 53 Irrigated Pasture Condition Scores Lone Pine Dairy Lease 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
Calving	84	X	X	98	X	X	96	X
Oystye	84	X	X	98	X	X	96	X
Golf Field	96	X	X	96	X	X	98	X
Middle Back	96	X	X	96	X	X	96	X
North Back	96	X	X	94	X	X	98	X

X indicates no evaluation made

Summary of Irrigated Pastures

Pastures on the lease are in excellent condition and have never decreased in score since monitoring has started. There are no management changes recommended for the lease.

Stockwater Sites

There were no stockwater sites implemented on the Lone Pine Lease. Stockwater is provided by irrigation diversion and water troughs.

Fencing

There was no new fencing, nor are there any plans to construct any new fences on the lease.

Salt and Supplement Sites

All salt and supplemental feeding is in designated areas away from any riparian areas.

7.3.2.30. Mount Whitney Pack Lease (RLI-495)

The Mount Whitney Ranch (626 acres) consists of the Diaz Parcel (146 acres), south of Diaz Lake and Lone Pine; and the Tuttle Parcel (480 acres), west of Lone Pine and is periodically used for horses/mules.

The following tables present the summarized utilization data for each field/pasture, and the transects in each field.

Table 7. 54 Grazing Utilization for Tuttle Field, Mount Whitney Pack Lease, RLI-495, 2007-14

Field	2007	2008	2009	2010	2011	2012	2013	2014
Tuttle Field	61%	0%	0%	0%	0%	27%	0%	0%
****Riparian Utilization, 40%***								

Table 7. 55 Grazing Utilization for Transects on the Mount Whitney Pack Lease, RLI-495, 2007-14

Fields/Pastures	Transects	2007	2008	2009	2010	2011	2012	2013	2014
Tuttle Field	TUTTLE_01	61%	0%	0%	0%	0%	27%	0%	0%
Riparian Utilization, 40%									

Summary of Utilization

The Tuttle Field is rarely grazed. Most use typically occurs from wildlife. Monitoring will continue regardless if grazing occurs or not.

Range Trend

Tuttle Field

TUTTLE_01 is located in the Tuttle Field on a Dehy-Conway-Lubkin-Association, 0-9% slopes. Because of the complexity of different soil units in ecological sites associated with the unit vary from Wet Meadow, Saline Meadow, to Gravelly Loamy Sand. The actual site appears to be a xeric oriented Saline Meadow transitioning to a Gravelly Loamy Sand site. Trends across the five year period appear static.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 56 Irrigated Pasture Condition Scores Mount Whitney Pack Lease 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
East Diaz	80	80	78	80	82	88	88	X
West Diaz	80	80	72	80	78	88	82	X

X indicates no evaluation made

Summary of Irrigated Pastures

In 2007 the Diaz irrigated pastures were at the minimum with conditions looking as though it would decline the next year. This was due to the presence of weeds and over grazing. Over the past seven years the lessee has worked to reduce the amount of weeds and reduce the grazing intensity on the pasture. This has helped to improve the condition of the pastures and increase the scores.

Stockwater Sites

There were no stockwater sites implemented on the Mount Whitney Lease. Stockwater is provided by the irrigation ditches and diversions.

Fencing

There is no new fencing, nor are there any plans to construct any new fences on the lease.

Salt and Supplement Sites

All salt and supplemental feeding is in designated areas.

7.3.2.31. Horse Shoe Ranch Lease (RLI-480)

The 2,966-acre Horseshoe Grazing Lease (RLI-480) contains the Lake and Cottonwood Parcels. The Cottonwood Parcel, located on the Kern Plateau at 10,000 feet elevation, is being grazed under USDA Forest Service grazing prescriptions. The lower elevation Lake Parcel borders the southwest side of Owens Lake.

Lake Parcel

The Lake Parcel includes a portion of what was once the Owens lakebed and later the shoreline of Owens Lake. The 1,956-acre parcel lies west and east of U.S. Highway 395, about 24 miles south of Lone Pine near lower Cottonwood Creek. Most of the lease lies west of U.S. Highway 395 (West Field), while most of the forage lies east of U.S. Highway 395, in the East Field. Only very dry vegetation types (i.e., Creosote bush) survive on the east side. The eastern part of the lease lies along a remnant wind wave-formed shoreline of Owens Lake.

The majority of the livestock forage occurs along a north-south running fault that forces underground water to the surface along an old lakeshore contour. Springs emerge from the fault forming open water ponds, marshes, and wet and dry meadows. The springs all drain eastward and disappear in the "old" lakebed. Charcoal Kiln Pond, near the border of the parcel, contains 5 acres of standing water and could support pupfish and/or Tui chubs. The pond is completely isolated from all other fish species. Remnants of old charcoal production kilns occur within the parcel that may have significant historic value. The remains of an old railroad bed, with tracks and ties removed runs south to north through the parcel.

Utilization is not measured on this portion of the lease, due to species composition of the vegetation around the spring. Annual monitoring of seeps and springs is conducted.

Cottonwood Parcel

The Cottonwood Parcel lies in rolling high elevation hills with topography heavily modified by snow and ice during past glacial periods. These rolling hills enclose grassy, high elevation meadows. A Forest Service trailhead and camping area borders the parcel on the north and serves as a "jump-off" point for recreationists to the Golden Trout Wilderness. City lands, totaling 1,011 acres, abut the south end of the trailhead parking and camping area. City lands are scattered in separate sub-parcels surrounded by Forest Service lands. These sub-parcels lie in and around Horseshoe Meadows two parcels are in or around Round Valley Meadows, and the last and largest sub-parcel is in Last Chance Meadow, with Cottonwood Creek flowing through it. The Last Chance Meadow area is classified as a "Research Natural Area." All LADWP meadows being grazed are about 10,000 feet in elevation.

Horseshoe and Round Valley Creeks flow through City lands and merge downstream with Cottonwood Creek. The Golden Trout Wilderness, created under the Endangered American Wilderness Act, surrounds City lands.

Since these parcels are surrounded by the national forest and there are no fences, the parcels are managed under federal grazing guide lines.

7.3.2.32. Archie Adjunct (RLI-489)

The Archie Adjunct Lease comprises about 627 acres, and is managed in conjunction with the LADWP leases at Islands, Delta, Georges Creek, Fort Independence, and Lubkin, as well as their own private land. The Archie Adjunct Lease is just north of Olancha, lying on both sides of U.S. Highway 395 and is south of the Crystal Geyser Bottling Plant. The lease borders the Homeplace Lease to the south and BLM land to the west and north. The lease is divided into one pasture, two fields, a corral, and holding pen. The Archie Pasture east of U.S. Highway 395 is irrigated exclusively from Cartago Creek through a water delivery pipeline. A 17-acre marsh along the east side of the Archie Pasture has formed in response to irrigation run-off.

In 1989, mudslides covered large parts of the North Field and eliminated large forage areas. The North Field is used in the spring to hold livestock prior to going to a Forest Service grazing allotment for summer grazing and again in the fall when they return from the Forest Service grazing allotment.

The Archie Adjunct is comprised primarily of irrigated pastures and has no utilization transects.

<u>Irrigated Pastures</u>

The following table shows Irrigated Pasture Condition scores.

Table 7. 57 Irrigated Pasture Condition Scores Archie Adjunct 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
Lake Field	84	X	X	90	X	X	74	X
Bolin	84	X	X	X	X	X	90	X
Archie	82	X	X	88	X	X	90	X

X indicates no evaluation made

<u>Summary of Irrigated Pastures</u>

Irrigated pastures on this lease have always rated well since 2007. Irrigation water on the lease is managed well by the lessees. The pastures have good species composition and are not over grazed. The Lake Fields score dropped in 2013 due to drought conditions. The continued drought in 2014 did not allow the field to improve. When drought conditions improve the field should improve. There are no recommended changes for this lease.

Stockwater Sites

There are no new stockwater sites planned for the lease.

Fencing

No new fencing is planned for the lease beyond general maintenance.

Salt and Supplement Sites

Supplement is used in designated sites and is composed of cake tubs.

7.3.2.33. Olancha Creek Adjunct (RLI-427)

The Olancha Creek Adjunct Lease (RLI–427) is managed in conjunction with the Lone Pine Lease (RLI–456) in the Lower Owens River area. One of the owners of the Spainhower Anchor Ranch near Lone Pine (Gabe Fohgerty) manages the lease. The lessee also manages the Lone Pine Lease surrounding the town of Lone Pine. Mr. Fohgerty manages the Olancha Creek Adjunct Lease in combination with the Ash Creek BLM allotment located between Cartago and Lone Pine, and the Monache Meadows Forest Service allotment in the southern Sierras.

The lease has been used as a staging area for cattle coming to and from the Lower Owens River area on their way to graze Forest Service lands in the southern Sierras. The lessee typically sends cows with calves to the Forest Service's Monache Meadows on July 1 and grazes this allotment until about October 1. Animals are taken to the Lone Pine area for the winter.

The lease lies in Olancha and is bisected by U.S. Highway 395. Saltgrass-sacaton meadow, irrigated pasture, and semi-desert shrub vegetation types are prominent. The lease shares a common boundary with the Homeplace Lease to the north. The Olancha Creek Adjunct Lease is made up of seven fields and pastures.

There are 56 acres on the lease irrigated with water diverted from Olancha Creek. Both Olancha Creek and the diversion ditch need frequent cleaning to allow sufficient water to reach irrigated lands. The irrigated pastures are used to grow livestock forage. No grass hay or alfalfa hay is produced on the lease. All four Esta fields and most of the two Oesta Fields are irrigated. The West Field, east of the Olancha Creek Diversion Ditch, is abandoned agricultural land that is not grazed except for two days in October and one day in the spring for weed control. The West Field, west of the diversion ditch, is semi-desert shrub land.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 58 Irrigated Pasture Condition Scores Olancha Creek Adjunct, 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
Esta 1	84	X	X	88	X	X	92	X
Esta 2	92	X	X	90	X	X	92	X
Esta 3	X	X	X	88	X	X	92	X
Esta 4	X	X	X	88	X	X	86	X
Oesta 1	72	84	78	82	80	86	86	X
Oesta 2	58	74	78	82	80	86	86	X

X indicates no evaluation made

Summary of Irrigated Pastures

The irrigated pastures on the Olancha Creek lease have rated well for the past seven years except the Oesta 1&2 pastures. These pastures have continual trouble with irrigation water and shrub encroachment. The pastures are sandy and require a lot of water. Over the past several years irrigation management has improved and some of the shrubs have been removed, which has increased the pastures scores.

Stockwater Sites

Stockwater is provided by irrigation ditches and troughs located in the pastures.

Fencing

There are no fencing projects planned for this lease other than general maintenance.

Salt and Supplement Sites

Cake mineral and protein tubs are put out during the winter. The locations of these tubs are rotated around in the pastures.

7.3.2.34. Homeplace Adjunct (RLI-428A)

The Homeplace Adjunct Lease is just north of Olancha, between the Olancha Creek Lease to the south and the Archie Lease to the north. The lease consists of 11 pastures and fields (Table 1). The lease is bisected by U.S. Highway 395. Two small fields (Little Bull and South Fields) are west of the highway. About a third of the lease is irrigated grass pasture (199 acres) east of the highway. No irrigated grass hay or alfalfa hay is harvested on the lease.

The Homeplace Adjunct Lease (644 acres) is managed as part of the 32,641-acre Blackrock Lease (RLI-428). The lease is managed by Mark Lacey and John Lacey, in combination with their Blackrock Lease in the Lower Owens River area. The Homeplace Adjunct Lease was a pivotal part of the Lacey grazing operation in the past.

Historically, the lease was used as a holding area for cattle herds going to and from Forest Service lands in the southern Sierras. During this holding period, the lease was nearly vacant of livestock most of the summer and fall (a 90-day period) when the herd was on Forest Service lands. The lessees sold their Forest Service permits and cattle must now either remain on the Homeplace Adjunct Lease year-round or go to some other grazing property.

The lease is mainly grazed as a cow-calf operation. Olancha Creek provides irrigation and stockwater. LADWP Well 404 supplies supplemental water when Olancha Creek flows are inadequate for irrigation and stockwater.

Livestock are fed supplements when needed. Supplemental feeding sites are rotated around the pastures to reduce trampling effects. Feeding sites are mainly on the more alkali portions of the pastures where less grass is produced. One hired person manages the grazing and irrigation on the lease year-round.

Pastures and fields are flood irrigated from April 1 to October 1 to increase livestock forage production. Most pastures are sub-irrigated by the elevated water table resulting from irrigation. Because Gus Walker Creek recently washed out and changed channels, the stream no longer delivers water to the lease. Olancha Creek, in combination with well water, delivers water year-round for livestock drinking purposes. All irrigated pastures have ditches to carry the necessary livestock drinking water. Water troughs are present in all pastures that are supplemented by irrigation water. All pastures and fields are completely fenced. Fences are in good to fair condition. The lessees maintain all exterior and interior fences.

A proposed California Department of Transportation plan for the reconstruction and widening of U.S. Highway 395 might take the eastern side of this lease for construction of a new roadway. Most of the land identified for the proposed roadway is now irrigated pasture. This grazing plan assumes that highway relocation will not take place and there will be no infringement on the lease. If, in the future, the highway construction project takes part of the lease, this plan will be modified. Cattle numbers, grazing duration, and timing will all need to be adjusted to match the lesser amount of forage available on the remaining grazing lands.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 59 Irrigated Pasture Condition Scores Home Place Adjunct, 2007-14

Pasture	2007	2008	2009	2010	2011	2012	2013	2014
L Pasture	80	88	X	94	X	X	94	X
Hay	80	90	X	94	X	X	94	X
East Stud	92	X	X	96	X	X	96	X
West Stud	80	88	X	96	X	X	94	X
Store	80	90	X	92	X	X	98	X
Woven	80	90	X	94	X	X	80	X

X indicates no evaluation made

Summary Irrigated Pastures

For the past seven years the irrigated pastures on the Home Place portion of RLI-428 have rated well, maintaining pasture condition. There are no recommended management changes for this lease.

Stockwater Sites

Stockwater is provided by irrigation ditches and troughs located in the pastures.

Fencing

In 2014 the main corrals were re-built. No fencing projects are planned for this lease other than general maintenance.

Salt and Supplement Sites

Supplement is comprised of hay and liquid molasses. Feeding locations are designated and used each year.

7.3.2.35. Blackrock Lease (RLI-428)

The Blackrock Lease is a cow/calf operation consisting of 32,674 acres divided into 24 management units or pastures. Blackrock is the largest LADWP grazing lease within the LORP area. The pastures/leases on the Blackrock Lease provide eight months of fall through spring grazing, which can begin any time after 60 continuous days of rest. A normal grazing season begins in early to mid-October and ends in mid-May or June.

There are twenty pastures on the Blackrock Lakes lease within the LORP boundary: South Blackrock Holding, White Meadow Field, White Meadow Riparian Field, Reservation Field, Reservation Riparian Field, Little Robinson Field, Robinson Field, East Robinson Field, North Riparian Field, Russell Field, Locust Field, East Russell Field, South Riparian Field, West Field, Wrinkle Field, Wrinkle Riparian Field, Spring Field, Wrinkle Holding, Horse Holding, and North Blackrock Holding. Twelve of these pastures are monitored using range trend and utilization. The other eight pastures are holding pastures for cattle processing or parts of the actual operating facilities.

Summary of Utilization

The following tables present the summarized utilization data for each pasture/field, and each transect within the pasture.

Table 7. 60 Grazing Utilization for Fields/Pastures on the Blackrock Ranch Lease, RLI-428, 2007-14

Fields/Pastures	2007	2008	2009	2010	2011	2012	2013	2014
Horse Holding	67%	13%	1%	36%	29%	31%	0%	0%
Locust Field	68%	15%	14%	34%	15%	32%	32%	53%
***North Riparian**	72%	51%	21%	29%	31%	10%	35%	39%
Reservation Field	68%	34%	38%	37%	29%	26%	30%	11%
Robinson Field	76%	55%	14%	23%	6%	28%	25%	17%
Russell	85%	49%	15%	39%	6%	26%	26%	1%
***South Riparian Field**	35%	25%	26%	21%	23%	23%	19%	8%
Springer Field	77%	43%						
White Meadow Field	3%	9%	19%	10%	9%	19%	19%	7%
***White Meadow Riparian**	87%	0%	75%	0%	57%	32%	21%	15%
Wrinkle Field	51%	33%	27%	44%	24%	20%	22%	21%
***Wrinkle Riparian Field**	8%	13%	29%	41%	18%	24%	29%	28%
West Field				22%	38%	41%	36%	18%
****Riparian Utilization, 40%***								

Table 7. 61 Grazing Utilization for Transects on the Blackrock Ranch Lease, RLI-428, 2007-13

Fields/Pastures	Transect	2007	2008	2009	2010	2011	2012	2013	2014
Horse Holding	BLKROC_9	67%	13%	1%	36%	29%	31%	0%	0%
Locust Field	BLKROC_06	68%	15%	14%	34%	13%	32%	32%	53%
***North Riparian**	BLKROC_12	0%	67%	6%	16%	0%	0%	0%	Flooded
	BLKROC_22	72%	36%	36%	43%	31%	31%	35%	39%
Reservation	BLKROC_02	69%	31%	0%	36%	0%	18%	35%	0%
	BLKROC_03	81%	44%	54%	46%	53%	27%	33%	12%
	BLKROC_44	72%	37%	49%	45%	0%	28%	40%	22%
	BLKROC_49	41%	10%	12%	16%	0%	11%	0%	0%
	BLKROC_51	80%	46%	48%	33%	41%	39%	44%	15%
	RESERV_06	0%	0%	29%	48%	23%	34%	30%	18%
Robinson Field	BLKROC_04	76%	58%	14%	22%	8%	38%	24%	18%
	ROBNSON_2	0%	52%	15%	23%	4%	18%	25%	16%
Russell Field	BLKROC_05	85%	43%	19%	48%	13%	24%	22%	2%
	RUSSELL_02	0%	55%	12%	31%	0%	28%	31%	0%
***South Riparian**	BLKROC_13	45%	29%	28%	10%	31%	23%	15%	15%
	BLKROC_23	25%	8%	43%	20%	22%	0%	0%	0%
	SOUTHRIP_3		39%	5%	33%	19%	10%	10%	8%
	SOUTHRIP_4					20%	36%	31%	2%
	SOUTHRIP_5						0%	18%	10%
White Meadow	BLKROC_01	7%	2%	4%	4%	0%	9%	18%	0%
	BLKROC_39	0%	4%	0%	0%	0%	0%	0%	0%
	WMEAD_03	0%	15%	37%	12%		29%	43%	0%
	WMEAD_04	0%	7%	0%	0%	0%	3%	0%	5%
	WMEAD_05	05	17%	52%	34%	36%	54%	32%	29%
***White Meadow**	BLKROC_11	0%	0%	75%	0%	68%	55%	30%	16%
	BLKROC_14	87%	0%						
	BLKROC_26					45%		6%	18%
	WMRIP_T5						23%	29%	29%
	WMRIP_T4						23%	21%	21%
	WMRIP_T1						26%	0%	0%
Wrinkle Field	BLKROC_07	51%	28%	26%	40%		7%	28%	6%
	WRINKL_03		37%	28%	48%	24%	34%	17%	35%
***Wrinkle Riparian**	BLKROC_18	30%	21%	43%	46%	48%		30%	20%
	BLKROC_19	0%	10%	12%	26%	8%	15%	28%	20%
	BLKROC_20	0%	11%	34%	53%	12%	33%	38%	34%
	BLKROC_21	0%	9%	28%	38%	6%		21%	40%
West Field	WRINKLE_2				22%	38%	41%	36%	18%
****Riparian Utilization, 40%***									

Summary of Utilization

Riparian

Utilization on the Blackrock lease has shown a steady decline in utilization in the riparian pastures on the lease since 2007. This has been due to the implementation of the Lower Owens River Project (LORP) and the 40% grazing utilization standard. Since the beginning of the project there has been a need to add or drop transects in the riparian pastures, this can be seen in the tables above. There has also been some grazing trials done using animal impacts to remove shrubs and annual weeds in 2010-2011. During these times utilization was waived in the pastures. These trials have had some beneficial effects on the riparian meadow habitat but, the overall benefit to the riparian pastures has been the re-introduction of flows to the river channel. Some further High-impact short duration trials will be conducted in the White Meadow Riparian Field in 2015.

Summary of Range Trend Data and Condition Blackrock Lease

There are twenty-six range trend sites on the Blackrock Lease. Fourteen are located on Moist Floodplain ecological sites. Six of these sites are located along the historical 'dry reach' of the river (BLKROC_10, 11, 14, 15, 16, and 17). The similarity index for these six sites ranged between 4-47% averaged across all sampling periods.

The similarity index on BLKROC_11 averaged 47% across the entire baseline period indicating the site is in fair condition. All other sites in the former dry reach averaged less than 20%, indicating the sites are in poor condition. The similarity index for BLKROC_11 is higher due to persistence of perennial grasses at the site. At other dry reach sites, there was a loss of perennial grasses on the floodplain resulting from Los Angeles Aqueduct diversions.

The similarity indices for Moist Floodplain sites, which were not dried by Aqueduct diversions, have historically received perennial flow, ranged from 45-80%. Similarity indices for the eight sites located on Saline Meadow ecological sites ranged from 10-86%. With the exception of BLKROC_01 and BLKROC_02, the remaining six sites were in good to excellent condition. The three range trend sites on Sodic Fan, BLKROC_09, BLKROC_51, and BLKROC_44, have been in good condition while the one Sandy Terrace site BLKROC_49, is in fair condition. In general there have been no departures outside of the typical range of variability observed since monitoring has begun on all sites with the exception of a spike in sacaton on BLKROC_19 and increases Nevada saltbush on BLKROC_16. Therefore similarity to site potentials in 2010 are likely very similar to what was calculated during the baseline period.

Significant changes in 2013 frequency beyond what had previously been observed during the baseline period occurred on two of the 24 sites. This was an increase in Beardless wildrye on BLKROC_21 and an increase in Cattail on BLKROC_18.

Significant increases when compared to 2010 on Moist Floodplain sites for saltgrass occurred on two sites and decreased on two sites, Alkali sacaton decreased on two sites, Nevada saltbush decreased on three sites, Bassia decreased on three sites, Beardless wildrye increased on one site and decreased on another, Mohave seablite decreased on one site, Baltic rush decreased on one site and Cattail increased on one site.

Significant changes on Saline Meadow sites in 2013 compared to 2010 were a decrease in saltgrass on one site, and an increase in Alkali sacaton on two sites and a decrease on one site.

Significant changes on Sodic Fan sites in 2013 compared to 2010 were an increase in saltgrass in one site and an increase in alkali sacaton on another site.

Description of Monitoring Transects by Pasture

White Meadow Riparian Field

BLKROC_10 is located in the White Meadow Riparian Field. The soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, 0-2% slopes, which corresponds to the Moist Floodplain ecological site. The transect is located within the historical dry reach of the river. The similarity index has ranged between 6-25% during baseline period. Utilization estimates have not been conducted during the past three years because of the dense stands of bassia has prevented access by livestock. An increase in Nevada saltbush and bassia frequency outside baseline parameters were detected during the monitoring year 2009 but in 2010 frequency for both species decreased. Nevada saltbush continues to have a high frequency when compared to 2002-2007, which coincided with the pre-watering years. As waters raise, the soil profile along the floodplain, Nevada saltbush has responded with only 2.8 m of canopy cover in 2003 to 59.7 m of cover in 2010 and is now beginning to decline in 2014 to 37 m. Nevada saltbush density has also declined. The site has begun to show an increase in saltgrass while sacaton has remained stable as well as the perennial forb, mallow (MALE3). To date, fire would not improve the site, because of the small perennial grass component in the area.

BLKROC_11

BLKROC_11 is located in a riparian management area in the White Meadow Riparian Field. The soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, 0-2% slopes, which corresponds to the Moist Floodplain ecological site. The transect is located within the historical dry reach of the river. The similarity index has ranged between 36-64% during the baseline period. Inkweed, Nevada saltbush, and bassia frequency increased in 2009 and have subsequently stabilized until 2014, where cover declined to pre LORP levels. Perennial grass frequency did not change in 2014.

BLKROC_14

BLKROC_14 is located within the historical dry reach of the Owens River in the White Meadow Riparian Field. The soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, 0-2% slopes, which corresponds to the Moist Floodplain ecological site. The similarity index for this site ranged between 9% and 25% during the baseline period. The site is in poor condition when compared to its corresponding ecological site description. Nevada saltbush significantly increased in 2009 and saltgrass significantly decreased to 0 in 2009 and remained so in 2010, in 2013 saltgrass frequency began to increase again. Nevada saltbush is increasing on the site with canopy cover increasing from 8.8 m to 31.3 m and an increase in frequency as well to the highest level seen on the site in 2014. These increases are likely a result from rewatering this portion of the Owens River. In 2010 frequency for bassia was at its highest seen on the site since 2004 (prior to the 2008 burn) but has subsequently dropped. Utilization was not sampled on this transect due to the lack of measurable forage.

White Meadow Field

BLKROC_01

BLKROC_01 is located on an upland site in the White Meadow Field. The soils are mapped as the Division-Numu Complex, 0-2% slopes soil series, which corresponds to a Saline Meadow ecological site. The similarity index at the monitoring site has ranged between 12-18% during the baseline period. Herbaceous production for the site is much lower than potential, while shrub production is much higher than typical for a Saline Meadow site at its potential. In 1968-69, this entire area was scraped to store runoff. This type of activity significantly altered the area's ability to resemble a Saline Meadow in high ecological condition. Frequency trend was static in 2013 when compared to baseline years.

BLKROC_39 is located on an upland site in the White Meadow Field. The soils are Division-Numu Complex, 0 to 2% slopes, which corresponds to the Saline Meadow ecological site. The similarity index ranged between 55-64% during the baseline period. However, based on ocular estimates, production is far less than typical for a Saline Bottom site. The site was scraped during the wet winter of 1968-69. The loss of the 'A horizon' during this period has likely contributed to the poor productivity of the site. Frequency in 2013 did not depart from previous sampling periods and has not shifted beyond baseline frequency values.

Reservation Field

BLKROC_02 is located in the Reservation Field, which is designated as an upland pasture. The soils are mapped as Manzanar-Winnedumah Association, 0-2% slopes soil series, which corresponds to the Saline Meadow ecological site. The similarity index has varied widely during the baseline period ranging between 28-55%, largely because of fluctuations in alkali sacaton production. The site is dominated by shrubs and may not be able to reach site potential unless shrub densities are reduced. There was no significant change in frequency in 2013 when compared to earlier years. The general trend for the area is static. Cover has remained static since 2003.

BLKROC_03 is located in the Reservation Field on the Shondow Loam 0-2% slopes soil series. The transect is on a Saline Meadow ecological site in an upland pasture. The site has ranged between 63%-72% similarity to the site's potential, placing the area in good to excellent condition. The site produces large quantities of Alkali sacaton. Frequency results show saltgrass has decreased steadily over all years while sacaton has increased on BLKROC_03. Increases in frequency, cover, and density for Rubber rabbitbrush have markedly risen during the past three sampling periods. As mentioned in 2009, because this site is experiencing an increase in shrub abundance while maintaining high grass cover, this area should be considered a candidate for a prescribed burn in the near future before sacaton cover starts to be replaced by even greater amounts of Rubber rabbitbrush. Presently, the site is in excellent condition but not stable due to the rising abundance of woody species.

BLKROC_44 is located in an upland site in the Reservation Field. The soils are Manzanar-Winnedumah Association, 0-2% slopes, which corresponds to the Sodic Fan ecological site. Similarity index has ranged between 62-87%. There was no significant difference between 2010 and 2013; however, Baltic rush has not been present on the site since 2009. The site is static and in good condition. Manzanar-Winnedumah soils will not support large amounts of perennial grass; therefore, burns on the soil types should not occur if the goal is to increase perennial grass production.

BLKROC_49 is located in an upland site in the Reservation Field. The soils are Mazourka Hard Substratum-Mazourka-Eclipse Complex, 0-2% slopes, which corresponds to the Sandy Terrace ecological site. The similarity index ranged between 14%-38% during the baseline period. The poor similarity index was a result of having too much Saltgrass and Alkali sacaton in the plant community composition. Sandy Terrace ecological sites are shrub dominant sites with low annual aboveground biomass production. The ecological site description does not account for instances with large abundances of perennial grasses. There were no significant changes in frequency values.

BLKROC_51 is located in an upland site in the Reservation Field. The soils are Winnedumah Silt Loam, 0-2% slopes, which corresponds to the Sodic Fan ecological site. The similarity index for the site during baseline period ranged between 46-78%. The site has a higher grass component and lower shrub component than expected for Sodic Fan site, thus lowering the similarity index. Saltgrass is exhibiting a downward trend on the site.

Reservation Riparian Field

BLKROC_15 is in a riparian management area, located in the Reservation Riparian Field. The soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, 0-2% slopes, which corresponds to the Moist Floodplain ecological site. The site is located on the historical ‘dry reach’ of the Owens and has not begun to show signs of recovery since the return of flows in December 2006. The similarity index is poor for the site ranging between 8-11%. Tamarisk slash was burned at the site in the winter months of 2008 and subsequently invaded by bassia in 2010 with frequency at its highest seen on the site. Although there were no statistically significant changes from 2010 compared to 2013, there appears to be several general trends when looking at estimates across all sampling periods. There is a disappearance of all annual forbs that is a result of the increased canopy cover of Nevada saltbush and bassia. Saltgrass had slowly decreased on the site but has since increased in 2013. Shrub cover has more than doubled on the site. Similar to other sites along the rewatered riparian corridor litter has increased while bare soil has decreased.

BLKROC_16 is located in a riparian management area on the Reservation Riparian Field. The soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, 0-2% slopes, which corresponds to the Moist Floodplain ecological site. Similar to BLKROC_17, BLKROC_15, BLKROC_14, BLKROC_10 and BLKROC_11 the site is on the historical 'dry reach' of the Owens River. The similarity index is poor for the site ranging between 6-10%. The site is shrub dominated with no perennial grass component. Frequency of Nevada saltbush and bassia increased in 2010, both species exceeded what has been previously observed for the site. Resulting from the rewatering adjacent to the site, Nevada saltbush increased from 5.2 m in 2005 to 44.5 m in 2010 to 46.3 in 2013. Greasewood disappeared in 2013, possibly because of a rising water table. Litter has increased while bare soil has decreased.

BLKROC_17 is located in a riparian management area on the Reservation Riparian Field. The soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, 0-2% slopes, which corresponds to the Moist Floodplain ecological site. The similarity index ranged between 3-5% for the site. Similar to other sites on the historical 'dry reach' of the Owens River, BLKROC_17 has not begun to respond from returned river flows. The site is shrub dominated (Nevada saltbush) with little to no perennial grass component. Frequency did not differ between 2010 and 2013. Canopy cover of Nevada saltbush increased substantially in 2010 and decreased slightly in 2013.

Robinson Field

BLKROC_04 is located on an upland site within the Robinson Pasture. The soil series is Manzanar Silt Loam, 0-2% slopes and is a Saline Meadow ecological site. Similarity index during the baseline period ranged between 52-74%. The site has a high diversity of perennial grasses and low shrub composition. In 2009, Baltic rush and Creeping wildrye frequency significantly increased while Alkali sacaton significantly decreased when compared to 2007, neither of these changes were significantly different from baseline sampling ranges (2002-2004). However, these increases were short-lived and in 2010 Creeping wildrye and Baltic rush decreased to levels typically observed for the site and continued to increase again in 2013. Alkali sacaton frequency decreased while Saltgrass remained static on the site. Short term trends have fluctuated with 2013 appearing to be wetter than 2010 but when factored into what has previously been observed on the site, current trends remain within historic ranges.

North Riparian Field

BLKROC_22 is located in a riparian management area in the North Riparian Field. The soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, 0-2% slopes, which corresponds to the Moist Floodplain ecological site. Similarity index has been at 57% for 2006-07. There were no significant departures in frequency when compared to previous years and the site remains static.

South Riparian Field

BLKROC_13 is in a riparian management area located in the South Riparian Field. The soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, 0-2% slopes, which corresponds to the Moist Floodplain ecological site. The similarity index ranges from 76-83% during the time period of 2002-2007. Saltgrass frequency declined significantly in 2013. Creeping wildrye (LETR5) has increased since 2004 and continued to increase in 2013.

BLKROC_23 is in a riparian management area located in the South Riparian Field. The soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, 0-2% slopes, which corresponds to the Moist Floodplain ecological site. The similarity index ranged between 78-79%. The site is in excellent condition with a minimal shrub component. Frequency values have not varied significantly over the five sampling periods with the exception of Nevada saltbush in 2010.

Russell Field

BLKROC_05 is located on an upland site in the Russell Field. The soil series is Manzanar Silt Loam, 0-2% slopes. The site is a Saline Meadow ecological site. The similarity index ranged between 75-88% during the baseline period, indicating that the site is in excellent condition. Frequency results appear static. Shrub cover (rubber rabbitbrush) at the study plot continues to show a gradual decline.

Wrinkle Field

BLKROC_07 is located on an upland site in the Wrinkle Field. The soil series is Manzanar Silt Loam, 0-2% slopes and is a Saline Meadow ecological site. The similarity index ranged between 79-93% during the baseline sampling period indicating the site is in excellent condition. Frequency values remain static. Shrub cover and density appear to be stable on the site.

Locust Field

BLKROC_06 is located on an upland site in the Locust Field. The soil series is Manzanar Silt Loam, 0-2% slopes and the ecological site is a Saline Meadow. The similarity index ranged between 73-85% during the baseline sampling period indicating the site is in excellent condition. Frequency values have remained static.

Wrinkle Riparian Field

BLKROC_18 is a riparian management area located in the Wrinkle Riparian Field. The soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, 0-2% slopes, which corresponds to the Moist Floodplain ecological site. The similarity index has ranged between 53-75%. Saltgrass frequency decreased significantly between 2007 and 2009 and continued to drop in 2010 to a level beyond what has been seen on the site previously, in 2013 values rose to the highest seen on the site. Conversely, sacaton increased beyond the historical range for the site in 2010 and has since decreased in 2013.

BLKROC_19 is located in a riparian management area in the Wrinkle Riparian Field. The soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, 0-2% slopes, which corresponds to the Moist Floodplain ecological site. The similarity index on the site has ranged between 71-79%. Saltgrass frequency decreased in 2010 when compared to 2009 and has continued to decrease in 2013. Sacaton frequency rose to its highest level since sampling has begun in 2010 and has subsequently decreased in 2013, although its contribution to the total plant community is not significant. All other plant frequencies were static. Shrub cover has increased over time at the site.

BLKROC_20 is located in the Wrinkle Riparian Field. The soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, 0-2% slopes, which corresponds to the Moist Floodplain ecological site. The similarity index has ranged between 63-74% for the site. Creeping wildrye continued to increase beyond baseline parameters in 2010 but then dropped significantly in 2013. Nevada saltbush cover and density have steadily increased since 2005 until 2013 where a decrease in cover occurred.

BLKROC_21 is in a riparian management area located in the Wrinkle Riparian Field. The soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, 0-2% slopes, which corresponds to the Moist Floodplain ecological site. Similarity index has ranged between 58-68% during the baseline period. The site's shrub component is greater than what would be expected for a Moist Floodplain site at its potential. In general plant frequency did not differ in 2013 from 2010 with the exception of a significant increase in Creeping wildrye.

Horse Holding Field

BLKROC_09 is located on an upland site in the Horse Holding Field, on the Winnedumah Fine Sandy Loam 0-2% slopes soil unit. The transect is located on a Sodic Fan ecological site, the similarity index for the transect ranged between 56-82% during the baseline period. The decline in similarity index occurred in response to a decline in Nevada saltbush. Saltgrass frequency in 2013 increased to its highest level. There is a declining trend in Nevada saltbush.

<u>Irrigated Pastures</u>

There are no irrigated pastures on the Blackrock Lease.

<u>Stockwater Sites</u>

All the wells for the Blackrock lease had been drilled and fitted for solar pumps and necessary plumbing for the troughs. However, the north of Mazurka well was drilled on BLM property and is going to be removed and a new well will be drilled south of the current location. The lessee will be responsible for water troughs and installation. There are also three other stockwater sites that have been developed as part of the 1997 MOU, which required additional mitigation (1600 Acre-Foot Mitigation Projects). The "North of Mazourka Project" will provide stockwater in the Reservation Field and the

"Well 368/Homestead Project" will provide stockwater in the Little Robinson Field and East Robinson Field.

Fencing

There was no new fencing constructed on the lease beyond general maintenance.

Salt and Supplement Sites

Many of the supplement sites located on the Blackrock Lease have been in place for many years and are located in upland management areas. Some of these sites have been moved in order to adapt to the installation of new fencing. These new locations were selected as to better distribute cattle within the newly created riparian pastures.

7.3.2.36. Twin Lakes Lease (RLI-491)

The Twin Lakes Lease is a 4,912-acre cow/calf operation situated just south of the Los Angeles Aqueduct Intake. It includes a reach of the Owens River that lies mainly north of Twin Lakes, which is located at the southern end of the Twin Lakes Lease. Of the 4,912 acres, approximately 4,200 acres are used as pastures for grazing; the other 712 acres are comprised of riparian/wetland habitats and open water. In all but dry years, cattle usually graze the lease from late October or early November to mid-May.

There are four pastures on the Twin Lakes Lease within the LORP boundary: Lower Blackrock Riparian Field, Upper Blackrock Field, Lower Blackrock Field, and the Holding Field. The Lower Blackrock Riparian, Upper Blackrock Riparian, and Lower Blackrock Fields contain both upland and riparian vegetation. The Holding Field contains only upland vegetation. There are no irrigated pastures on the Twin Lakes Lease. Range trend and utilization transects exist in all fields except the Holding Field. Range Trend transects were last read on this lease in 2012.

Summary of Utilization

The following tables present the summarized utilization data for each pasture/field, and each transect within the pasture.

Table 7. 62 Grazing Utilization for Fields/Pastures on the Twin Lakes Lease, RLI-491, 2007-14

Fields/Pastures	2007	2008	2009	2010	2011	2012	2013	2014
Lower Blackrock Field	40%	14%	0%	0%	1%	5%	9%	7%
*Lower Blackrock Riparian	89%	44%	37%	6%	38%	54%	BURN	6%
*Upper Blackrock Field	45%	41%	43%	17%	26%	61%	BURN	20%
**Riparian Utilization, 40%*								

Table 7. 63 Grazing Utilization for Transects on the Twin Lakes Lease, RLI-491, 2007-14

Fields/Pastures	Transect	2007	2008	2009	2010	2011	2012	2013	2014
Lower Blackrock	BLKROC_37	40%	9%	0%	0%	0%	5%	15%	15%
	BLKROC_F_4		10%		0%	0%		23%	2%
	TWNLAKE_02	16%	17%	BURN	0%	4%		0%	6%
	TWNLAKE_05	65%	23%	BURN	0%	0%		0%	0%
***Lower Blackrock**	BLKROC_RIP_7		61%	53%		34%	72%	BURN	10%
	TWNLAKE_03	82%	28%	21%	6%	42%	36%	BURN	2%
	TWNLAKE_04	85%						BURN	0%
	TWNLAKE_06	87%						BURN	0%
***Upper Blackrock**	BLKROC_RIP_5			52%	21%	25%	51%	BURN	9%
	BLKROC_RIP_6			53%	19%	29%	74%	BURN	10%
	BLKROC_RIP_8		41%	42%	17%	18%	70%	BURN	50%
	INTAKE_01	45%		25%	13%	30%	49%	BURN	10%
****Riparian Utilization, 40%***									

Summary of Utilization

The Twin Lakes lease has also decreased utilization overall since the implementation of the LORP. The only years utilization was high was in 2007 and 2012. In 2007 this was the first year of adhering to the new riparian utilization standard of 40% and there was a three year grace period post project implementation to become compliant for the lessees. Over grazing in 2012 was a result of drought and the lessee failing to move livestock to the Lower Blackrock Field earlier in the season. In 2013 a range burn was conducted in the Upper and Lower Blackrock Riparian fields. The burn had good results and meadow in the fields responded well. Utilization was below the allowable riparian standard in 2014.

Summary of Range Trend Data and Conditions

Upper Blackrock Field

INTAKE_01 is located in the Upper Blackrock Field. The soils are mapped as Torrifluvents-Fluvaquentic Endoaquolls Complex; but the majority of the study plot is located on the adjacent soil unit, Torrifluvents, 0-2% slopes, which is associated with the Saline Meadow ecological site. Site similarity to the potential ranged during the baseline monitoring period between 71-77%, placing the site in high ecological condition. Frequency for saltgrass significantly increased in 2009 when compared to 2007 and subsequently decreased in 2010, and then rose again to the highest level for the site in 2012. Utilization on this transect was 49%, the highest seen for the site.

Lower Blackrock Field

TWINLAKES_02 is located in the Lower Blackrock Field on the Pokonahbe-Rindge Family Association soil series, which corresponds to the Saline Bottom Wetland ecological site. Presently there is no ecological site description for Saline Bottom Wetland ecological site. Referencing the site to a Saline Bottom ecological site, the similarity index ranged between 42%-62%. The site would be in a higher ecological condition if the wetland component was accounted for in the ecological site description because of the greater abundance of Mesic graminoids such as *Juncus balticus* (JUBA) and *Spartina gracilis* (SPGR) present on the site, which are typically minor components on the more xeric Saline Bottom ecological site.

The transect was burned in mid-February, 2009. Shrub cover prior to the burn was moderate which resulted in a cooler burn when compared to similar areas further south in Drew Slough. Because of the cool fire, a decrease in shrub frequency, shrub cover, and shrub recruitment were observed in 2009 and 2010. Alkali cordgrass (*Spartina gracilis)* significantly increased in 2010 and continued to increase in 2012. Alkali sacaton (SPAI) also increased markedly in 2012. There was no utilization on this transect in 2010.

TWINLAKES_05 is located in Lower Blackrock Field on the Manzanar-Division Association, 0-2% slopes soil unit which corresponds to the Saline Meadow ecological site. The transect was burned in late January 2009 and was subsequently submerged when the Drew Unit of the BWMA was flooded. Because of this, range trend sampling and utilization estimates are currently not available.

Lower Blackrock Riparian Field

TWINLAKES_03 is located in the Lower Blackrock Riparian Field. The soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, which corresponds to the Moist Floodplain ecological site. The similarity index during baseline period ranged between 63%-65%, placing it in good ecological condition, explained by the dominance of saltgrass on the site. Nevada saltbush is much greater than the described potential for the site. The site also lacks in diversity of perennial grasses. Frequency for saltgrass and Nevada saltbush increased between 2009-07. Saltgrass frequency was significantly higher than all previous sampling events in 2009 while in 2010 saltgrass decreased to its lowest value since monitoring has begun on the site and in 2012 rose to one of the highest levels for the transect. Utilization was minimal for this transect with all of the utilization occurring on saltgrass.

TWINLAKES_04 is located in the Lower Blackrock Riparian Field in the former dry reach. The soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, which corresponds to the Moist Floodplain ecological site. The similarity index is poor, ranging between 4-5%. Unlike TWINLAKES_03, which has historically benefitted from a shallow water table, TWINLAKES_04 has yet to respond favorably from returned flows into the Lower Owens River. The site is predominantly Nevada saltbush, inkweed, and fivehorn smotherweed. Frequency significantly increased for bassia and inkweed in 2009 and 2010 when compared to 2007 and disappeared in 2012. Inkweed frequency in 2009 and 2010 was greater than baseline parameters (2002-04 and 2007) but dropped significantly in 2012. Inkweed cover has also substantially increased from trace amounts prior to returning flows to the river to over 37 m of canopy along the transect in 2010 and then dropping to 12.5 m in 2012. Inkweed in 2014 continued to decline. No utilization estimates exist for the site due to the absence of key forage species.

TWINLAKES_06 is located in the Lower Blackrock Riparian Field. Soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, which corresponds to the Moist Floodplain ecological site. Similarity index to the site's potential was 19% between 2006-07. As with TWINLAKES_04, the site is dominated by shrubs, invasive annual forbs, and a scant amount of perennial grasses as the understory. Because of this, and the fact that the area is inaccessible to livestock, utilization is not estimated on this site. Plant frequency in 2009 indicated a significant increase in Nevada saltbush and bassia. In 2010 saltgrass decreased to its lowest level for the site but in 2014 saltgrass rose to one of the highest levels seen on the transect. Shrub cover for Nevada saltbush continues to increase on the site rising from 5.4 m in 2006 to 66.6 m in 2010. In 2012 there was a slight decrease in Nevada saltbush cover which continued to decline rapidly in 2014 to 35.88m. At the same time Mojave seablite has steadily decreased on the site.

Fencing

There was no new fencing constructed on the lease in 2014.

Salt and Supplement Sites

Supplement is composed of a liquid mix that is put in large tubs with rollers that the cattle consume. These tubs are placed in established supplement sites and are used every year.

Burning

A range burn was conducted in March resulting in 190 acres of riparian pasture being burned. This burn was not scheduled in 2012 but, the location had previously been selected by Watershed Resources staff. The purpose of the burn was to remove existing saltcedar slash piles and shrubs that had encroached in to existing perennial grass meadows. Prior to the burn, California Department of Forestry (CDF) and LADWP prepared fire breaks and created buffers around existing riparian vegetation, resulting in complete fire containment, with very little loss to riparian vegetation. Overall the burn resulted in the improvement of the meadow habitat on the Twin Lakes lease.

7.3.2.37. Intake Lease (RLI-475)

The Intake Lease is used to graze horses and mules employed in a commercial packer operation. The lease is comprised of three fields: Intake, Big Meadow Field, and East Field (approximately 102 acres). The Intake Field contains riparian vegetation and an associate range trend transect. The Big Meadow Field contains upland and riparian vegetation; however, it is not within the LORP project boundaries. There are no utilization or range trend transects in the Big Meadow Field due to a lack of adequate areas to place a transect that would meet the proper range trend/utilization criteria. Much of the meadow in the Big Meadow Field has been covered with dredged material from the LORP Intake. The East Field consists of upland and riparian vegetation. The Big Meadow and Intake Fields were not used by livestock during the construction of the Intake structure, which lasted until the 2008-09 grazing season. There are no irrigated pastures on the Intake Lease. There are no identified water sites needed for this pasture and no riparian exclosures planned due to the limited amount of riparian area within the both pastures.

The following table presents the summarized utilization data for each field for the current year.

Table 7. 64 End of Grazing Season Utilization on the Intake Lease, RLI-475, 2014

Field	Utilization	Transect	Utilization
Intake Field*	10%	*STEWART_01	10%
**Riparian Utilization, 40%*			

Summary of Utilization

Utilization for the Intake Lease is well below the allowable 40% utilization standard.

Summary of Range Trend Data and Conditions

STEWART_01 is located in the riparian Intake Field. The soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, which corresponds to the Moist Floodplain ecological site. The site was sampled for the first time in 2009. The site appears stable with both Alkali sacaton (SPAI) and Saltgrass (DISP) abundant on the site. Nevada saltbush (ATTO) frequency decreased slightly yet canopy cover for the same species has doubled. Bassia was not present on the plot in 2013.

7.3.2.38. Thibaut Lease (RLI-430)

The 5,259-acre Thibaut Lease is utilized by three lessees for wintering pack stock. Historically, the lease was grazed as one large pasture by mules and horses. Since the implementation of the LORP and installation of new fencing, four different management areas have been created on the lease. These areas are the Blackrock Waterfowl Management Area, Rare Plant Management Area, Thibaut Field, and the Thibaut Riparian Exclosure. Management differs among these areas. The irrigated pasture portion located in Thibaut Field was assessed using irrigated pasture condition scoring and the upland portions of the field were evaluated using range trend and utilization transects. The Rare Plant Management Area is evaluated using range trend and utilization transects. The Riparian Exclosure has been excluded from grazing for 11 years.

Summary of Utilization

The following tables present the summarized utilization data for each pasture/field, and each transect within the pasture.

Table 7. 65 Grazing Utilization for Fields/Pastures on the Thibaut Lease, RLI-430, 2007-14

Fields/Pastures	2007	2008	2009	2010	2011	2012	2013	2014
Rare Plant Management	87%	46%	61%	2%	38%	39%	20%	27%
Thibaut Field	85%	37%	22%	17%	25%	12%	4%	10%
Waterfowl Management	57%	OFS	FLOOD	19%	38%	BURN	0%	46%
***Riparian Utilization, 40%**								

Table 7. 66 Grazing Utilization for Transects on the Thibaut Lease, RLI-430, 2007-14

Fields/Pastures	Transect	2007	2008	2009	2010	2011	2012	2013	2014
Rare Plant Management	RAREPLANT_2	76%	32%	77%	0%	48%			
	RAREPLANT_3	98%	52%	58%	7%	46%	45%	4%	25%
	THIBAUT_2	88%	55%	49%	0%	19%	34%	36%	29%
Thibaut Field	THIBAUT_3	89%	65%	36%	65%	74%	15%	20%	40%
	THIBAUT_8		15%	8%	4%	0%	14%	0%	0%
	THIBAUT_9		3%	6%	0%	0%	0%	0%	0%
	THIBFIELD_2	81%	64%	62%	31%	76%	30%	0%	22%
	THIBFIELD_3			13%	3%	0%		5%	0%
	THIBFIELD_4			6%	0%	0%	0%	0%	0%
Waterfowl Management	THIBAUT_1	80%	OFS	FLOOD	3%		BURN	OFS	50%
	WATERFOWL_2	15%	OFS	FLOOD	40%	30%	BURN	OFS	56%
	WATERFOWL_3		OFS	FLOOD	21%	33%	BURN	OFS	33%
	WATERFOWL_4	57%	OFS	FLOOD	11%	51%	BURN	OFS	
	WATERFOWL_5	77%	OFS	FLOOD		39%	BURN	OFS	
***Riparian Utilization, 40%**									

Summary of Utilization

Utilization on the Thibaut lease has been within the upland standard of 65% in the Thibaut Field. There has been some problems in the Rare Plant Field and Waterfowl Management Area due to the special grazing parameters, that have been placed on the fields. These issues have been resolved by adjusting stocking rates and timing in the fields. Other management changes have been to feeding livestock in different locations and the use of a stockwater well to help better distribute livestock in the Thibaut Field. There are no planned management changes for the lease.

Summary of Range Trend Data and Conditions

Range Trend transects were read in 2014 across the entire lease.

Thibaut Riparian Exclosure

THIBAUT_04 is in a riparian management area in the Thibaut Riparian Exclosure. The soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, 0-2% slopes, which corresponds to the Moist Floodplain ecological site. This site is located in the historical 'dry reach' of the Owens River. Similarity indices were consistently at 3%, with community composition dominated by Nevada saltbush and nonnative bassia and Russian thistle. Low precipitation during the winters of 2012-2014, has prevented bassia from germinating on the site. Nevada saltbush cover expanded from 10m in 2003, to 48m in 2010, but have subsequently decreased to 23m in 2013, and rose again to 26.9 in 2014. When compared to 2010, Nevada saltbush appears to be dying off as a result of a rising water table. Many of the shrubs were exuding large amounts of sap in 2012 and 2013. Shrubs that exhibit these signs most are located in the lower regions of the flood plain, presumably closer to the rising water table. Livestock are currently excluded from the Thibaut Riparian Pasture.

THIBAUT_05 is in a riparian management area in the Thibaut Riparian Exclosure. The soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, 0 to 2% slopes, which corresponds to the Moist Floodplain ecological site. This site is located in the historical 'dry reach' of the Owens River. The similarity index was 3% during baseline sampling. Frequency in 2009 indicated an increase *Heliotropium curassavicum* (salt heliotrope), plant symbol HECU3 and *Malvella leprosa* (alkali mallow), plant symbol MALE3; two native perennials. This increase has continued into 2013, with salt heliotrope occupying the largest amount of live plant cover on the site. In 2014 mallow continued to significantly increase while Salt heliotrope declined. The increase of these early seral forbs and the presence of some trace amounts of perennial saltgrass are encouraging signs that return flows may be initiating successional changes on the site. As with all other floodplain areas in the former dry reach, bassia covered the site in 2008. No new growth of bassia was noted in 2013. Unlike most riparian transects in the former dry-reach section Nevada saltbush occupies a small niche in the plant community within the Thibaut_05 macroplot. Livestock are currently excluded from the Thibaut Riparian Exclosure.

THIBAUT_06 is in the Thibaut Riparian Exclosure, soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, 0-2% slopes, which corresponds to the Moist Floodplain ecological site. The similarity index during baseline sampling ranged between 10-16%. The site is located within the historical dry reach of the river. Tamarisk slash piles were burned at this site in 2008. As with all other floodplain areas in the former dry reach, bassia covered the site in 2008. No new growth of bassia was noted in 2009, but the site remained covered by decadent stands of this invasive weed. In 2013 bassia disappeared from the site. Frequency results in 2009 and 2010 indicate that return flows may be initiating changes at the site; salt heliotrope and saltgrass significantly increased compared to previous years in 2009 and remained at similar levels in 2010. In 2013 saltgrass continues to expand while salt heliotrope declined to 2010 levels. Results from 2014 mirrored those seen in 2013.

THIBAUT_07 is in a riparian management area in the Thibaut Riparian Exclosure. The soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, 0-2% slopes, which corresponds to the Moist Floodplain ecological site. The site is located within the historical dry reach of the Lower Owens River. Similarity index was 5% during the baseline sampling period. Slash piles were burned adjacent to the transect but not directly on the transect. Mallow has increased significantly on the site in 2014. Nevada saltbush frequency dropped significantly on the site when compared to 2004-2010. Shrub cover reflects a similar pattern.

Thibaut Field

THIBAUT_03 is located in the upland Thibaut Pasture. The soils are Shondow Loam, 0-2% slopes, corresponding to the Saline Meadow ecological site. Similarity indices ranged between 71-92% during baseline sampling due to high cover of sacaton and saltgrass, and low shrub cover. Although the similarity index is high for this site, production seems lower than expected for the Saline Meadow. Saltgrass frequency increased in 2009 compared to 2007 but remained within typical range of variability observed during previous sampling periods. Saltgrass remained at similar levels to 2009 in 2010. In 2014 saltgrass, alkali sacaton, and American licorice significantly declined.

Rare Plant Management Area

THIBAUT_02 is located in the Rare Plant Management Area which will be managed as an upland pasture. The soils are Shondow Loam with 0-2% slopes, which correspond to the Saline Meadow ecological site. The similarity index varied between 91-100% during the baseline sampling due to high frequencies of DISP, SPAI, and a low shrub component. Despite the high similarity index, production at the site for the soil type appears low. Baltic rush and rubber rabbitbush frequency decreased in 2009 compared to values in 2007. In 2010 Baltic rush and saltgrass increased significantly but remained within historic parameters observed on the site. In 2010 Nevada saltbush seedlings increased from 0 to 46. In 2014 frequency for both saltgrass and sacaton declined significantly. Utilization on the site has varied from since 2007 from high use to no use. This is due to the random locations that are selected every year by the lessee to feed livestock.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Irrigated Pasture Condition Scores 2011-13

Pasture	2011	2012	2013
Thibaut Field	82%	81%	78%

The northern portion of the Thibaut Pasture (85 acres) comprises the area managed as irrigated pasture for the Thibaut Lease. A result of the completion of the waterfowl management area to the north and the rare plant field to the south is a grazing corridor, which puts heavy pressure on the irrigated pasture. Grazing prescriptions were reinstated for the waterfowl management area this year. This put pressure on the irrigated portion of the lease decreasing its irrigated pasture condition rating to 78%.

LADWP Watershed Resources staff recommends that livestock be moved out of the area periodically during the grazing season to allow the area to rest. This may be achieved by supplemental feeding further south in the Thibaut Field, electric fencing, or turning the livestock out in the southern end of Thibaut Field instead of the corral area. This irrigated pasture will be re-evaluated in the 2013-14 grazing season.

Stockwater Sites

There is one developed water site in the Thibaut Field, which consists of a flowing well that has a stockwater well drilled next to it, located in the uplands east of the irrigated pastures in the Thibaut Field. Currently, the flowing well is still creating a small puddle area for livestock and wildlife. The lessee has also installed a trough near the well.

Fencing

There was no new fence constructed on the lease in 2014.

Rare Plant Management Area Thibaut

This pasture contains both Owens valley Checkerbloom and Inyo County star tulip populations. Trend plots for Rare Plant Management Area 1 and Rare Plant Management Area 4 are within an exclosure that is restricted from grazing from early March through early October per the LORP EIR during the rare plants' flowering, fruiting, and seeding period. The pasture was grazed with end-of-season utilization at 38%.

Table 7. 67 Rare Plant Management Area, Thibaut Lease

Plot Number	Year	Species	Seedling	Juvenile	Mature	Total
Rare Plant Management Area 1	2009	Owens Valley checkerbloom	N/A	N/A	N/A	N/A
	2010		1	0	24	25
	2011		15	5	32	52

	2012		34	0	42	76
	2013		45	0	52	97
	2014		35	0	35	70
Rare Plant Management Area 2	2009	Inyo County star-tulip	N/A	N/A	N/A	N/A
	2010		0	0	12	12
	2011		0	0	4	4
	2012		2	0	7	9
	2013		4	0	8	12
	2014		24	0	25	49
Rare Plant Management Area 4	2009	Owens Valley checkerbloom	N/A	N/A	N/A	N/A
	2010		3	0	38	41
	2011		9	12	40	61
	2012		31	0	44	75
	2013		28	0	45	73
	2014		22	0	52	74
Rare Plant Management Area 4	2009	Inyo County star-tulip	N/A	N/A	N/A	N/A
	2010		0	0	4	4
	2011		0	0	2	2
	2012		0	0	1	1
	2013		0	0	3	3
	2014		1	0	4	5

Salt and Supplement Sites

Hay is spread in locations of the lessees choosing using a truck or a trailer pulled by a truck. Feeding areas had been changed during the 2012-13 grazing season resulting in decreased utilization in the Thibaut Field.

7.3.2.39. Islands Lease (RLI-489)

The Islands Lease is an 18,970-acre cow/calf operation divided into 11 pastures. In some portions of the lease, grazing occurs year round with livestock rotated between pastures based on forage conditions. Other portions of the lease are grazed October through May. The Islands Lease is managed in conjunction with the Delta Lease. Cattle from both leases are moved from one lease to the other as needed throughout the grazing season.

There are eight pastures located within the LORP boundary of the Islands Lease:
- Bull Field
- Reinhackle Field
- Bull Pasture
- Carasco North Field
- Carasco South Field
- Carasco Riparian Field
- Depot Riparian Field
- River Field

Summary of Utilization

The following tables present the summarized utilization data for each pasture/field, and each transect within the pasture.

Table 7. 68 Grazing Utilization for Fields/Pastures on the Islands Lease, RLI-489, 2007-14

Fields/Pastures	2007	2008	2009	2010	2011	2012	2013	2014
***Carasco Riparian South**	28%	18%	11%	0%	0%	26%	21%	9%
***Depot Riparian**	82%	29%	30%	30%	20%	53%	43%	45%
Lubkin	48%	0%	14%	0%	0%	5%	6%	3%
***River Field**	42%	11%	27%	4%	15%	50%	17%	27%
South Field	52%	31%	8%	3%	23%	10%	0%	0%
****Riparian Utilization, 40%***								

Table 7. 69 Grazing Utilization for Transects on the Islands Lease, RLI-489, 2007-14

Fields/Pastures	Transect	2007	2008	2009	2010	2011	2012	2013	2014
***Carasco Riparian South**	ISLAND_6	28%	18%	11%	0%	0%	26%	21%	9%
***Depot Riparian Field**	ISLAND_8	72%	18%	12%	20%	0%	68%	27%	31%
	ISLAND_9	92%	40%	49%	49%	25%	67%	39%	91%
	RIVERF_7				26%	29%	52%	47%	19%
	RIVERF_9				9%	8%	9%		51%
	RIVERF_12				44%	41%	71%	58%	38%
Lubkin	Lubkin_1	48%	0%	14%	0%	0%	5%	6%	3%
***River Field**	ISLAND_7	63%		46%	0%	0%		0%	0%
	ISLAND_10	63%	16%	3%	28%	0%	40%	44%	68%
	ISLAND_11	0%	6%	22%		11%	6%	0%	0%
	ISLAND_12			25%	0%	34%	31%	0%	52%
	RIVERF_8			47%	3%	0%	71%	52%	46%
	RIVERF_11				0%	58%	89%	0%	0%
	RIVERF_6				0%	0%	31%		0%
	ISLAND_14						81%	20%	48%
South Field	ISLAND_2	31%	15%	8%	0%	23%	0%	0%	0%
	ISLAND_59	74%	47%	18%	0%	0%	0%	0%	0%
	SOUTHF_2			3%	7%	24%	19%	0%	0%
****Riparian Utilization, 40%***									

Summary or Utilization

The Depot Riparian Field and River Field had exceeded utilization rates in the 2011-12 grazing season. In 2012-13 they were below the allowable standard of 40%. The use on the west side of the river, specifically the Islands was low. The Carasco Riparian Field and South Field were well below the utilization standards. Supplement was observed in a few locations on the floodplain in the Depot Riparian and River Fields. Overall , supplement has been moved off of the floodplains in all fields, having a direct result in the decreased utilization in the River Field and Depot Riparian Field.

All fields on the lease were in good condition except the large meadow portion of the River Field located southeast of the Alabama Gates. This location had been previously burned by LADWP in an effort to remove perennial shrubs, saltcedar slash, and improve forage production. This burn was successful meeting the previously mentioned goals. Despite the beneficial effects of the burn, the prolonged inundation from flow augmentation, has had a negative effect on this area. A shift in vegetation composition is occurring, accompanied by visually stressed perennial grasses and spreading of aquatic vegetation such as bull rush, that thrive in flooded and saturated locations. Continued inundation of this area will result in the loss of meadow habitat and the creation of marsh.

Summary of Range Trend Data in Islands

Range trend monitoring was conducted in 2014 on the Islands Lease. Five transects were read and four remained static when compared to previous sampling in 2010. Following the prescribed burn in 2011, shrub cover decreased to 0% on Island_08 and Island_10. Inland saltgrass significantly increased by 16% in the burn area on the Islands_08 transect.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 70 Irrigated Pasture Condition Scores Islands Lease RLI-489, 2007-14

Pastures	2007	2008	2009	2010	2011	2012	2013	2014
B Pasture	96	X	X	90	X	X	90%	X
D Pasture	96	X	X	94	X	X	90%	X

X indicates no evaluation made

Summary of Irrigated Pastures

The B and D Pastures located near Reinhackle Spring were rated in 2013 and received an irrigated pasture condition score of 90%. These pastures will be rated again in 2016.

Stockwater Sites

There are two stockwater sites located 1-1.5 miles east of the river in the River Field uplands near the old highway. These wells were drilled in 2010 and are now operational. The lessee has not yet installed the water troughs at the wells.

Fencing

There was no new fence constructed on the lease. An old section of fence located on the east side of the Owens River across from the Carasco Riparian Field was removed by the lessee during the winter of 2013.

Salt and Supplement Site:

Cake blocks and molasses tubs that contain trace minerals and protein are distributed for supplement on the lease. The blocks and tubs are dispersed randomly each time and if uneaten they are collected to be used in other areas.

7.3.2.40. Lone Pine Lease (RLI-456)

The Lone Pine Lease is an 8,274-acre cow/calf operation divided into 11 pastures and adjacent to a private ranch land. Grazing on the lease occurs from January 1 to March 30 and then again in late May to early June. In early June the cattle are moved south to Olancha and then driven to Forest Service Permits in Monache.

There are 11 pastures on the Lone Pine Lease located within the LORP project boundary:

- East Side Pasture
- Edwards Pasture
- Richards Pasture
- Richards Field
- Johnson Pasture
- Smith Pasture
- Airport Field
- Miller Pasture
- Van Norman Pasture
- Dump Pasture
- River Pasture

Summary of Utilization

The following tables present the summarized utilization data for each pasture/field, and each transect within the pasture.

Table 7. 71 Grazing Utilization for Fields/Pastures on the Lone Pine Lease, RLI-456, 2007-14

Fields/Pastures	2007	2008	2009	2010	2011	2012	2013	2014
Johnson Field	44%	0%	34%	63%	14%	0%	WAIVED	79%
River Field	77%	49%	55%	36%	32%	37%	BURNED	37%
***Riparian Utilization, 40%**								

Table 7. 72 Grazing Utilization for Transects on the Lone Pine Lease, RLI-456, 2007-14

Fields/Pastures	Transect	2007	2008	2009	2010	2011	2012	2013	2014
Johnson Field	LONEPINE_5	44%	0%	34%	63%	14%	0%	WAIVED	79%
***River Field**	LONEPINE_1	80%	45%	61%	49%	28%	22%	BURNED	38%
	LONEPINE_2	79%	47%	48%	25%	30%	32%	BURNED	30%
	LONEPINE_3	81%	49%	70%	37%	52%	63%	BURNED	64%
	LONEPINE_4	67%	55%	47%	32%	45%	45%	BURNED	20%
	LONEPINE_6	78%	44%	EX	EX	EX	EX	BURNED	EX
	LONEPINE_7		52%	51%	38%	8%	21%	BURNED	17%
	LONEPINE_8						42%	BURNED	52%
***Riparian Utilization, 40%**									

Summary of Utilization

Utilization was waived in the Johnson Pasture during the 2012-13 grazing season to provide the lessee a location to move livestock, due to the Lone Pine Fire, that burned the River Pasture at the end of February. Livestock entered the River Riparian pasture a few weeks prior to the fire. By doing this, much of the summer's production had not yet been harvested by the cattle. This provided a large fuel source for the fire which burned extremely hot and fast. Over 90% (525 acres) of the River Field was burned with a loss of several cattle and much of the riparian forest. Overall utilization on the lease has decreased over time and no management changes are needed.

The end of the current growing season has resulted in a recovered forage base, with ungrazed heights reaching or exceeding previous year's measurements. There will be no grazing restrictions for the lessee during the 2013-14 grazing season. A more in depth discussion of the fires effects will be provided in the range trend and woody recruitment portions of the report.

Summary of Range Trend Data

On February 24, 2013, approximately 525 acres in the River Pasture on the Lone Pine Lease were burned. The fire consumed nearly all of the Owens River floodplain on the Lone Pine Lease and was halted north of the Keeler Bridge. The Lone Pine range trend transects were read in 2012. Six of these transects were inside the blackline of the Lone Pine Fire. Although these transects were not scheduled to be read again until 2015, the plots were revisited in August 2013, in order to document post fire response. Sites with some pre-burn shrub cover (Lone Pine_03, Lone Pine_04, Lone Pine_02) declined to zero cover following the fire. Plant vigor was examined by comparing ungrazed perennial grass heights from this year's burned sites to previous year's plant heights for the same species (Table 7.73). Plant heights appear to show no consistent response to the fire. Saltgrass has its greatest mean height on LP_07 in 2013 and its lowest plant height on LP_04 in 2013. Sacaton is similar in its lack of any obvious relationship to fire and plant heights. Plant frequency of Alkali sacaton (SPAI) made significant declines on two sites and remained static on all others. At LONEPINE_06 frequency declined to the lowest level observed since sampling began in 2003. LONEPINE_06 is located inside a livestock grazing exclosure, the large amount of accumulated litter (fine fuel) likely contributed to increased fire temperatures and killed subsurface intercalary meristems, reducing the plants ability to expand during the subsequent growing season. Saltgrass shows no consistent pattern in post fire recovery. Its rhizomatous root structure likely served to benefit the plant in occupying vacant niches during the subsequent growing season if rhizomes were deep enough to avoid impacts from the fire. The appearance of Yerba mansa (*Anemopsis californica*) on Lonepine _08 is evidence of postfire recovery. The plant is an aggressive occupier of impacted saturated areas such as post burn locales or heavily grazed areas. The arrival of Chairmaker's bulrush (*Schoenoplectus americanus*) is an indication of changes in surface hydrology.

Table 7. 73 Lone Pine Lease Land Management - 1

Mean End of Growing Season Plant Heights (cm) between 2005 and 2013 for Saltgrass (DISP) and Alkali Sacaton (SPAI) on four Range Trend Transects.

		2005	2006	2007	2008	2009	2010	2011	2012	2013
LP_01	DISP	16	25		33				28	20
LP_03	DISP	16	27		34					27
LP_04	DISP		17	20	19	17	17	19	18	14
LP_07	DISP			22			20	17	20	25
LP_01	SPAI					31				49
LP_03	SPAI	106	115	105	106	98	101			99

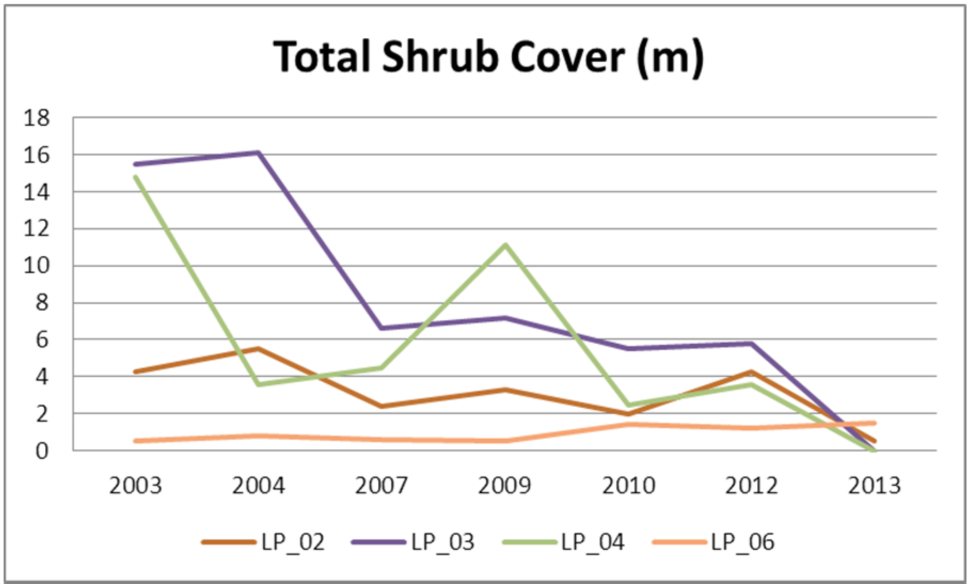


Figure 7. 15 Total Shrub Cover for elected transects on the Lone Pine Lease, 2003-13

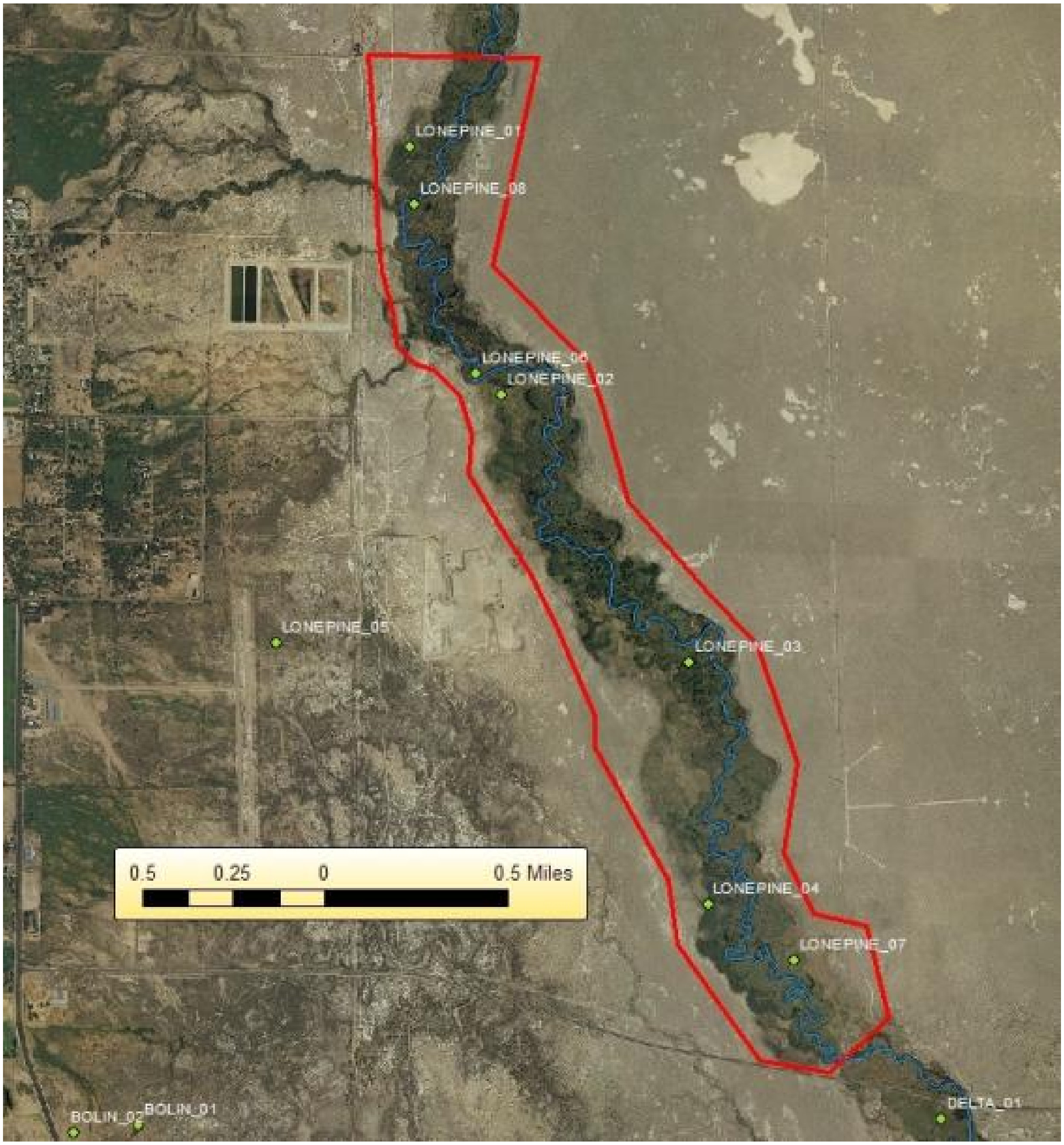


Figure 7. 16 Approximate Area of Lone Pine Wildfire - February 24, 2013

Lonepine_01 is in a riparian management area on the west side of the Owens River, just north of Lone Pine Creek in the River Pasture. The soil series associated with the transect is Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, and is on a Moist Floodplain ecological site. During the baseline period from 2002-07, similarity index has ranged between 76% and 79%. Annual aboveground production at this riparian site has exceeded typical quantities found in the Moist Floodplain ecological site description. This site supports four perennial graminoid species and is dominated by saltgrass (*Distichlis spicata* [DISP]). The overall biomass of shrubs is typical for a Moist Floodplain ecological site. No nonnative species were detected at the site. Creeping wildrye (LETR) significantly increased in 2009 and continues to remain stable. Saltgrass increased on the site in 2013. The upper two thirds of the transect was not burned in the Lone Pine fire of 2013.

Lonepine_02 is in a riparian management area on the west side of the Owens River, east of the Lone Pine Dump in the River Pasture. The soil series is Torrifluvents-Fuvaquentic Endoaquolls complex, 0-2% slopes, and is on a Moist Floodplain ecological site. The similarity index ranged between 65% and 87% from 2002 to 2007. The site is in excellent condition. The site is grass-dominated with saltgrass comprising the bulk of the biomass. Saltgrass frequency significantly increased in 2009, outside its historic range from 2002-07 and in 2010-13 returned to levels typically observed on the site. This site was burned in 2013, which have contributed to the decline in Alkali sacaton seen this year. No nonnative species were detected at the site.

Lonepine_03 is in a riparian management area on the west side of the Owens River in the River Pasture. The soil series is Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, and is on a Moist Floodplain ecological site. The similarity index has ranged between 74% and 87% during sampling periods between 2002-07, indicating the site is in excellent condition. Site production has exceeded the expected based on the ecological site description in all the years of sampling. The site is grass-dominated with saltgrass comprising the bulk of the biomass and Creeping wildrye closely reaching the potential described for the site at 13% in 2007. Frequency for Creeping wildrye increased significantly in 2009 and remained significantly higher in 2010 when compared to all sampling periods during the baseline period. There were no changes in frequency for all species between 2009-10 and 2012. Following the fire in the early spring of 2013 there appears to be an increase in Creeping wildrye and Baltic rush. Overall shrub cover was reduced to zero by the fire. No nonnative species were detected at the site.

Lonepine_04 is in a riparian management area on the west side of the Owens River in the River Pasture. The transect is located at the edge of the floodplain and currently incorporates a portion of the transition zone to upland vegetation. The soil series is Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes at the beginning of the transect and transitions to the Mazourka-Eclipse complex, 0-2% slopes. The transition in ecological sites is from a Moist Floodplain ecological site to a Sodic Terrace ecological site. Because of the mixed soils and associated ecological sites found across the transect evaluating trend for this site will concentrate on changes on trend rather than how well the site matches ecological site descriptions. The similarity index has ranged widely between 59% and 73% from 2002-07. When compared to the Moist Floodplain ecological site description, the site has less than the expected biomass of forage species such as creeping wild rye and Baltic rush. This is explained by the transition from mesic conditions on the Moist Floodplain to more xeric conditions of the uplands which results in a decreasing abundance of Creeping wildrye, Baltic rush, and riparian trees and the disproportionate amount of alkali sacaton which can better thrive in both the mesic and xeric transitional zones. The site is grass-dominated with Saltgrass and Alkali sacaton comprising the bulk of the biomass. The shrub component of the site is dominated by Rubber rabbitbrush. As flows on the Lower Owens continue, soil moisture may rise towards the upland zone of the transect and future changes in species composition may be observed. However, frequency data indicates that there is an inverse trend, with decreasing Saltgrass, and increasing Alkali sacaton which is a typical gradient in zones moving from wet to dry areas. No nonnative species were detected at the site. There were no changes in frequency from 2010 to 2012. Alkali sacaton is trending back to pre-2007 levels. This site was burned, which reduced shrub cover to zero in 2013.

Lonepine_06 is in a riparian management area on the east side of the Owens River in the River Pasture. This monitoring transect is located inside a riparian exclosure, constructed in February 2009. Over time the site will be used as a non-grazed reference site. The soil series is Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes on a Moist Floodplain ecological site.

The similarity index has ranged between 66% and 84% between 2003 and 2007. Site production has varied during the baseline period from above to below the expected based on the ecological site description. Compared to the potential outlined in the ecological site description, this site lacks the forb and woody riparian species component. The forage base is dominated by saltgrass and alkali sacaton. Other forage species such as Creeping wild rye and Baltic rush are lacking at this site. One nonnative species, Bassia, has been detected at the site. There was a significant decrease in Salt grass in 2012 and then a rise in frequency in 2013. Alkali sacaton decreased significantly on the site in 2013 (see earlier discussion). Shrub cover was reduced to zero as a result of the 2013 fire. The exclosure was completed in February 2009.

Lonepine_07 is in a riparian management area on the east side of the Owens River in the River Pasture. This site was first established in the summer of 2007. The soil series is Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes on a Moist Floodplain ecological site.

The similarity index was 60% in 2007. Site production was similar to that expected based on the ecological site description. There is little diversity of perennial graminoids as the only species detected was Saltgrass while other forage species such as Alkali sacaton and Creeping wild rye are lacking on the transect but are present in the area. The biomass of forbs and riparian woody species is less than expected as compared to the desired plant community. No nonnative species were detected at the site. Baseline utilization is not available for this site since it was not established until the summer of 2007. Between 2007 and 2013 frequency has not changed significantly on the site.

Lonepine_08 is in a riparian management area on the east side of the Owens River in the River Pasture. This site was first established in the summer of 2011. The soil series is Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes on a Moist Floodplain ecological site. The spike in Yerba mansa (*Anemopsis californica)* is in response to areas opened up by the 2013 fire.

Johnson Pasture

Lonepine_05 is in an upland management area in the Winnedumah fine sandy loam, 0-2% slopes soil series which is associated with a Sodic Fan ecological site, just east of the Lone Pine Airport in the Johnson Pasture. In 2004 the site flooded and was not sampled. An increase from 0 to 14 juvenile *Salix exigua* species in 2007 is evidence of this flooding.

The similarity index has ranged between 69% and 77% between 2002-07. Nevada saltbrush (*Atriplex torreyi* [ATTO]) has trended down over time. Frequency of Saltgrass significantly increased in 2009 and decreased in 2010 to similar levels to that seen during the baseline period. There were no other significant changes on the site. End-of-season utilization on this transect has consistently remained low except for 2010.

<u>Irrigated Pastures</u>

The following table shows Irrigated Pasture Condition scores.

Table 7. 74 Irrigated Pasture Condition Scores Lone Pine Lease RLI-456, 2007-14

Pastures	2007	2008	2009	2010	2011	2012	2013	2014
Edwards	80	80	80	90	X	X	84	X
Richards	64	82	82	84	X	X	84	X
Van Norm	X	X	X	80	X	X	84	X
Old Place	86	X	X	90	X	X	84	X
Smith	88	X	X	96	X	X	84	X
Miller	94	X	X	86	X	X	86	X

X indicates no evaluation made

<u>Summary Irrigated Pastures</u>

The irrigated pastures within the LORP project area for the Lone Pine Lease are the Edwards, Richards, Smith, Old Place, Miller and Van Norman Pastures. All of the pastures were rated in 2013 and were above the required minimum irrigated pasture condition score of 80%, despite a dry year and lack of irrigation water.

Stockwater Sites

One stockwater well was drilled on the Lone Pine Lease located in the River Pasture uplands. The approximate location is two miles east of the river on an existing playa. The lessee had made an effort to install a trough but, the well had a silting problem that plugged the pipes and floats. Watershed Resources staff and pump mechanics have assessed the condition of the well and it has been determined that the well is not operable. A new well location has been selected and a new well will be drilled in 2015.

Fencing

There was no new fencing constructed on the lease. Repairs have been made to the existing exclosure due to the fire in February of 2013.

Salt and Supplement Site:

All supplement tubs were situated outside of the flood plain.

7.3.2.41. Delta Lease (RLI-490)

The Delta Lease is a cow/calf operation and consists of 7,110 acres divided into four pastures. There are four fields located with the LORP project boundary: Lake Field, Bolin Field, Main Delta Field, and the East Field. Grazing typically occurs for 6 months, from mid-November to April. Grazing in the Bolin Field may occur during the growing season. The Delta and Islands Leases are managed as one with state lands leases.

Grazing utilization is currently only conducted in the Main Delta Field which contains the Owens River. The Lake Field is evaluated using irrigated pasture condition scoring. The East Field, located on the upland of Owens Lake, supports little in the way of forage and has no stockwater.

Summary of Utilization

The following tables present the summarized utilization data for each pasture/field, and each transect within the pasture.

Table 7. 75 Grazing Utilization for Fields/Pastures on the Delta Lease, RLI-490, 2007-14

Fields/Pastures	2007	2008	2009	2010	2011	2012	2013	2014
Bolin Field						65%	26%	16%
Main Delta	58%	58%	53%	51%	38%	43%	31%	37%
Riparian Utilization, 40%								

Table 7. 76 Grazing Utilization for Transects on the Delta Lease, RLI-490, 2007-14

Fields/Pastures	Transect	2007	2008	2009	2010	2011	2012	2013	2014
Bolin Field	BOLIN_1						0%	25%	16%
	BOLIN_2						65%	26%	
***River Field**	DELTA_1	58%	56%	59%	70%	38%	30%	19%	39%
	DELTA_2	61%	49%	EX	EX	EX	EX	EX	EX
	DELTA_3	72%	60%	54%	71%	12%	45%	26%	50%
	DELTA_4	83%	50%	55%	62%	33%	44%	38%	30%
	DELTA_5	50%	73%	54%	29%	50%	42%	40%	22%
	DELTA_6	26%	50%	35%	23%	42%	41%	26%	30%
	DELTA_7	60%	65%	61%	49%	51%	58%	36%	49%
Riparian Utilization, 40%									

Summary of Utilization

Utilization in the Main Delta was has tended to be high over the years. The data at the transect level shows, that use is usually higher in the northern and southern portions of the lease. However, since the construction of the drift fence west of the Pumpback Station in 2010, cattle are now put on the Owens Lake Delta at the beginning of the season. With the construction of the drift fence, this has kept cattle from drifting to the main Delta until later in the grazing season. Since the implementation of the LORP, forage production in the Owens Lake Delta has increased substantially allowing livestock to remain on the Delta for a longer period of the grazing season.

Summary of Range Trend Data and Conditions

Range trend transects on the Delta Lease are located on Moist Floodplain ecological sites. The similarity index averaged at each transect, over the four baseline sampling periods ranged between 48-70%. All sites lack a diversity of perennial grasses, and are dominated by saltgrass. The presence of alkali sacaton appears to follow a gradient with decreasing abundance following a decrease in elevation. Soil salinity appears to increase along this same gradient as soils transition from stream deposition to lacustrine deposition from the Owens Dry Lake. Alkali sacaton and Beardless wildrye are both known to not have as high a tolerance for saline soils as Saltgrass (USDA, NRCS 2009). These variables may be influencing species composition on the Moist Floodplain zones on the Delta Lease. There were no significant changes in plant frequencies between 2010 and 2013 with the exception of a decline in Saltgrass on DELTA_02 which dropped below all previous levels.

Delta Field

DELTA_01 is located in the Delta Field. The soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, 0-2% slopes, which corresponds to the Moist Floodplain ecological site. The similarity index varied between 67-72% during the baseline period. The site is dominated by Saltgrass with a small Alkali sacaton component. The site has remained static during all six sampling periods.

DELTA_02 is located in a grazing exclosure in the Delta Field. The soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, 0-2% slopes which corresponds to the Moist Floodplain ecological site. Similarity index ranged between 59-66% during the baseline period. Plant frequencies in 2013 did not change when compared to 2010 with the exception of Saltgrass. Rubber rabbitbrush cover appears to be trending downwards. Frequency values in 2010 did not statistically differ from the five prior sampling periods. Because the transect is now within an exclosure, utilization was not sampled in 2009-10.

DELTA_03 is located in the Delta Field. The soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, which corresponds to the Moist Floodplain ecological site. The site is predominantly Saltgrass. Frequency values did not vary from 2007-13.

DELTA_04 is located in the Delta Field. The soils are Torrifluvents-Fluvaquentic Endoaquolls complex, 0-2% slopes, which corresponds to the Moist Floodplain ecological site. Similarity index ranged between 63-71% during the baseline period. The site has remained relatively stable since vegetative sampling began, there were no significant changes in frequency values between 2007-10.

DELTA_05 is located in the Delta Field. The soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, 0-2% slopes, which corresponds to the Moist Floodplain ecological site. The similarity index ranged between 66-72% during the baseline period. The site has remained relatively stable since vegetative sampling began and there were no significant changes in frequency values between 2007-13.

DELTA_06 is located in the Delta Field. The soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, which corresponds to the Moist Floodplain ecological site. The similarity index ranged between 54-73% during the baseline period, this variation is a result of annual fluctuations in saltgrass production. Saltgrass frequency followed a similar decline in 2003 but has remained stable for all other sampling periods. There were no significant changes in frequency values between 2007-13.

DELTA_07 is located in the Delta Field, soils are Torrifluvents-Fluvaquentic Endoaquolls Complex, 0-2% slopes which corresponds to the Moist Floodplain ecological site. The similarity index during the baseline period ranged between 35-60%, responding to declines in saltgrass production on the site. This site has remained static.

Irrigated Pastures

The following table shows Irrigated Pasture Condition scores.

Table 7. 77 Irrigated Pasture Condition Scores Delta Lease RLI-490, 2007-14

Pastures	2007	2008	2009	2010	2011	2012	2013	2014
Lake Field	92	X	X	84	X	X	74	X

X indicates no evaluation made

The Lake Field is located west of U.S. Highway 395 north of Diaz Lake. This irrigated pasture was evaluated in 2013 and received a score of 74%. This is below the allowable score of 80%. The reason for the decreased condition of this pasture is due to drought conditions that impeded water distribution over the field. Watershed Resources staff do not believe that changes are necessary at this time. A normal precipitation year will improve pasture conditions, this pasture will be re-evaluated in 2015.

Stockwater Sites

The Bolin Field was supposed to receive a stockwater site supplied by the Lone Pine Visitors Centers well in 2010. After a more in-depth analysis of water availability was undertaken, it was ascertained that there was not an adequate amount of water to sustain both uses. The resulting analysis has stockwater being supplied from a diversion that runs from the LAA. The status of this stockwater situation has not changed in 2014.

Fencing

There was no new fencing on the lease for lease planned beyond general maintenance.

Salt and Supplement Sites

Cake blocks that contain trace minerals and protein are distributed for supplement on the lease. The blocks are dispersed randomly each time and if uneaten they biodegrade within one grazing season. There are also supplement tubs that are used in established supplement sites.

7.3.3. OVLMP Recreation Management Component

Chapter 4 of the OVLMP describes LADWP's goals, objectives, policies, and guidelines for future management with respect to recreation in the project area. Section 4.4 outlines several projects to address areas of specific concern that have experienced resource damage as a result of recreational use. These projects are described below with a status update provided.

Monitoring

Monitoring for this project includes a series of photo points based in this vicinity that were established prior to project implementation. Photos in these locations have been recaptured for the first 4 years following the completion of the project, and will be recaptured every 5 years thereafter for 10 years. Reporting for this project will be based on photo point documentation of changes over time, and reports include photos from monitoring locations, general information on noted changes, and any further information regarding modification to management prescription, if applicable. Monitoring and reporting for this project is conducted by periodic patrols by Watershed Resources Staff in their daily tasks. Goals in monitoring include notification of vandalism and success of the management measures in the field.

The Owens Valley Land Management Plan Recreation sites were visited by LADWP Staff on July 22-23, 2014. LADWP conducted photo point monitoring and assessed fence and signage condition (where applicable) and has generated recommendations for the project locations where necessary. Photo points were established in April 2011 and were recaptured at the peak of the growing seasons from 2011-2014. These photos can be made available upon request.

Owens River: Pleasant Valley Reservoir to Highway 6

Description

LADWP implemented a riparian fencing project between Pleasant Valley Reservoir and Highway 6 to improve the riparian health along the Owens River. Fencing was installed parallel to Chalk Bluffs Road. Boulders were used in lieu of fencing where the river is adjacent to the road. Designated parking areas, walkthrough access points (handicap and otherwise), and informational signs were also established along the new fence line. The size of the parking areas varied depending on the location. Walkthrough and/or other handicap access was provided at each parking area, and at supplemental locations along Chalk Bluffs Road. This project has been coordinated in conjunction with LADWP's Grazing Management Plans to meet grazing management and recreational use goals along the river. This project will also benefit species protection efforts under LADWP's Conservation Strategy for the Southwestern Willow Flycatcher.

Pleasant Valley (Former Boat Ramp)

Photo Point Monitoring

LADWP installed fencing along this section of the river in 2008. Parking areas outside the riparian corridor were established and walkthroughs were installed. The photos below show conditions following implementation of riparian fencing compared to the past growing season (both locations shown below are now fenced off from vehicular access). Saltgrass *(Distichlis spicata)* and Baltic rush (*Juncus balticus)* recruitment looks healthy and has established in the disturbed road areas.

Pleasant Valley #1, April 2011

Pleasant Valley #1, July 2014

Pleasant Valley #2, April 2011

Pleasant Valley #2, July 2014

Fence and Sign Condition

The fence and sign are in good condition.

Recommendations

Monitoring will continue for riparian vegetation recruitment and any signs of vandalism.

Pleasant Valley (Handicap Access 1 & 2)

Photo Point Monitoring

Saltgrass and Alkali sacaton (*Sporobolus airoides)* recruitment looks healthy and has established well over the old road at handicap access area 1. No photo points have been established at handicap access area 2. However, native recruitment at this area is also well established and healthy.

Pleasant Valley handicap access April 2011

Pleasant Valley handicap access July 2014

Fence and Sign Condition

The fence and sign are in good condition at both Handicap access areas.

Recommendations

Monitoring will continue for riparian vegetation recruitment and any signs of vandalism.

Pleasant Valley (Bank by Burned Cottonwood)

Photo Point Monitoring

Saltgrass and Alkali sacaton recruitment looks healthy and has established well over disturbed areas. As depicted below, narrow leaf willows (*salix exigua)* have grown and extended further out on the south bank.

Pleasant Valley Cottonwood April 2011 ***Pleasant Valley Cottonwood July 2014***

Fence and Sign Condition

The fence and signs are in good condition.

Recommendations

Monitoring will continue for riparian vegetation recruitment and any signs of vandalism.

Pleasant Valley (bank/pasture-access from boulder lot)

Photo Point Monitoring

Vegetation recruitment at this location is not as prominent as the other managed recreation sites but the saltgrass seed source is abundant. Vegetation depicted in photo points in the summer of 2014 appear similar to those taken in the spring and summer of 2011. LADWP tilled compacted soil in this area in the fall of 2013 to promote growth of saltgrass that is currently present on site. To date, recruitment of saltgrass continues to be gradual.

Pleasant Valley Boulder Lot, April 2011 ***Pleasant Valley Boulder lot, July 2014***

Fence and Sign Condition

The fence and sign are in good condition.

Recommendations

Monitoring will continue for riparian vegetation recruitment and any signs of vandalism.

Owens River: Highway 6 to Tinemaha Reservoir

Description

The Owens River between Highway 6 and Tinemaha Reservoir have several areas that have incurred resource damage due to high levels of recreational use. These problem areas occur where the river intersects Highway 6, East Line Street, Warm Springs Road, Highway 168, and Stewart Lane.

LADWP placed boulders and may use other barrier devices if necessary, to obstruct direct vehicular access to the banks of the river. LADWP may also install designated parking areas with walkthrough access points as well as signage in key locations where appropriate.

Highway 6 and the Owens River

Description

LADWP installed boulders to restrict vehicular access to the banks of the Owens River and to define parking areas in 2010. The photos below show conditions over the past four growing seasons from the Highway 6 bridge.

Photo Point Monitoring

Vegetation looks healthy and vigorous. This area is a hotspot for fishing and other recreational activities. Some trash was found throughout the area but there were no signs of vandalism.

Fence and Sign Condition

N/A

Recommendations

Monitoring will continue for riparian vegetation recruitment and any signs of vandalism.

Highway 6 (from bridge), April 2011

Highway 6 (from bridge), July 2014

Highway 6 and the Owens River (North Parking Area)

<u>*Photo Point Monitoring*</u>

Broadleaf pepperweed (*Lepidium latifolium*) is a very invasive and prolific plant and is present on the east bank of this area. Fivehorn smotherweed (*Bassia hyssopifolia)* has also increased in abundance over the pathway compared to 2013. However, recruitment of a native species, Salt heliotrope (*Heliotropium curassavicum*) has also increased in this area. Torrey's saltbush *(Atriplex Torreyi) and* Rubber rabbitbrush *(Ericameria nauseosa*) are abundant and healthy throughout the site. No signs of vandalism were observed.

Hwy 6 & Owens River N Parking, April 2011

Hwy 6 & Owens River N Parking, July 2014

Fence and Sign Condition

N/A

Recommendations

Pepperweed needs to be treated before it spreads and will be eradicated as resources are available. Monitoring will continue for riparian vegetation recruitment, weed encroachment, and any signs of vandalism.

Highway 6 and the Owens River (South Parking Area)

Photo Point Monitoring

Fivehorn smotherweed has died back from 2013. Torrey's saltbush and American licorice have established where Fivehorn smotherweed was previously dominant. No signs of vandalism were present.

Hwy 6 & Owens River S Parking, April 2011

Hwy 6 & Owens River S Parking, July 2014

Fence and Sign Condition

N/A

Recommendations

Monitoring will continue for riparian vegetation recruitment and any signs of vandalism.

East Line Street and the Owens River

Description

LADWP installed boulders to restrict vehicular access to the banks of the Owens River and to define a parking area in 2010.

Photo Point Monitoring

The photos below show conditions following the placement of boulders at East Line Street as well as conditions this past growing season. Overall vegetation looks healthy and is comparable to last year. Fivehorn smotherweed has taken over the guardrail but has died back on the hill between the fence and guardrail. The boulders remain in good condition and even though this is a popular location for river floats, there was minimal trash present and no signs of vandalism.

East Line Street, April 2011

East Line Street, July 2014

<u>Fence and Sign Condition</u>

The fence and sign are in good condition.

<u>Recommendations</u>

Monitoring will continue for riparian vegetation recruitment and any signs of vandalism.

East Line Street and the Owens River (Bank)

<u>Photo Point Monitoring</u>

Baltic rush has become more prominent along the bank and Fivehorn smotherweed has died back. No signs of vandalism were present.

East Line & Owens River Bank, April 2011

East Line & Owens River Bank, July 2014

Fence and Sign Condition

The fence and sign are in good condition.

Recommendations

Monitoring will continue for riparian vegetation recruitment and any signs of vandalism.

Warm Springs Road and the Owens River

Description

LADWP installed fencing and pedestrian walkthroughs to control access to this location that had endured heavy recreational use.

Photo Point Monitoring

The photos below were taken inside the area that has been restricted from vehicular use following placement of controls. The photo on the right depicts vegetation recruitment that has established over vehicular tracks from the past four growing seasons. Alkaki sacaton, Saltgrass, American licorice, Rubber rabbitbrish, and Torrey's saltbush continue to fill in gaps in the road. These species have significantly increased in cover since 2013. There are no signs of vandalism and the site has not been impacted any further by cattle or humans.

Warm Springs (toward river), April 2011

Warm Springs (toward river), July 2014

Fence and Sign Condition

The fence is in good condition.

Recommendations

Monitoring will continue for riparian vegetation recruitment and any signs of vandalism.

Highway 168 and the Owens River

Description

LADWP installed boulders and telephone poles to restrict vehicular access to the banks of the Owens River and to define a parking area in 2010 where the river intersects Highway 168.

Photo Point Monitoring

The photos below are taken from the designated parking area after vehicular controls were installed. The site has not been impacted any further by humans. Vegetation has established outside the parking area boundaries over the past four seasons post implementation of boulders and telephone poles.

Hwy 168 & the Owens River, April 2011

Hwy 168 & the Owens River, July 2014

Fence and Sign Condition

The restoration sign is in good condition.

Recommendations

Monitoring will continue for any signs of vandalism as well as riparian vegetation recruitment.

Highway 168 and the Owens River (Bank)

Photo Point Monitoring

The photos below depict the Owens River bank after telephone poles were installed to restrict vehicular access to a designated parking area. The photo on the right depicts vegetation recruitment from the past four growing seasons. The site has not been impacted any further by humans and vehicular traffic. However, large amounts of trash were present along the northern bank. Saltgrass recruitment is healthy and vigorous along the wood posts.

Hwy 168 & Owens River Bank, April 2011

Hwy 168 & Owens River Bank, July 2014

Fence and Sign Condition

The wood posts are present and in good condition.

Recommendations

Monitoring will continue for riparian vegetation recruitment and any signs of vandalism.

Stewart Lane and the Owens River

Status

Bank condition and riparian vegetation has improved at Stewart Lane since the OVLMP was written, so treatment in this area has been deemed unnecessary.

Owens River: Tinemaha Reservoir to Los Angeles Aqueduct intake

Description

The section of the Owens River directly south of Tinemaha Reservoir receives high use for fishing and other types of recreation. Currently, there is a parking area just below the dam that accommodates a number of vehicles and allows walking access to the river upstream of this location. There is also a network of roads along the river banks, which receives heavy recreational use.

To manage for current and future uses in this area, LADWP contemplated installing boulders or railroad ties along the north and east side of the existing parking area to discourage vehicles from driving directly up to the stream banks. However, from 2013-2014 resource impacts appeared to be reduced compared to prior years. There was some trash and one fire ring present, but overall the site was not heavily impacted.

Recommendations

Resource impacts appear to be reduced from past use; therefore LADWP is not proposing any additional controls at this time. Use in this area will continue to be monitored and vehicle restrictions will be implemented as necessary if resource concerns arise. Placing signage in this area may also help reduce future impacts.

Motocross Use off of Reata Lane:

Description

City land southwest of Bishop off of Reata Lane is a popular location for motocross. This area is not currently leased and is used by OHV enthusiasts at their own risk. LADWP will sign the area as City property to notify users of restrictions and that LADWP will not assume liability for this use of the area. LADWP will remain open to leasing this area to private entities as it has in the past, with the understanding that interested parties can provide a proposal along with the appropriate insurance to cover activities conducted on City lands. For special motocross events, LADWP will make the area available with the understanding that interested parties must submit their request in writing to use the area and a Letter of Permission will be granted if approved by the Aqueduct Manager. All requests for use must be made in writing and have proof of insurance.

Status

This area is signed as City property. While some entities have expressed interest, there have been no formal requests to host motocross events at Reata.

Buttermilk

Description

LADWP will continue to coordinate with the Inyo National Forest (INF) and the Bureau of Land Management (BLM) to discourage dispersed camping on City lands. If necessary, boulders or other barrier devices will be placed to prevent vehicle access to the waterways and prevent unauthorized camping. LADWP will increase signage in the area to educate visitors about the camping policies on City property and proper use of the land. Fire rings will be removed, as fires are only allowed in the City's thirteen designated campgrounds. LADWP will also place a permanent informational kiosk in the Buttermilk Country to educate the public about recreation policies as well as property boundaries between private (LADWP) and public (INF and BLM) lands. LADWP will work jointly with these agencies on the content of the information provided at the kiosk and explore cost sharing opportunities.

Status

The INF installed a kiosk in the Buttermilk Country that shows access roads and camping/campfire policies on federal lands.

Due to consecutive drought years, in combination with an increase in unauthorized camping and campfires throughout the Buttermilk area on City lands, fire danger is extremely high. LADWP installed signage in spring 2012 at the beginning and end of City property on Buttermilk Road and other access roads. However, recreationists utilizing the area continue to ignore this signage. The number of fire rings, as well as the amount of trash and broken bottles has significantly increased since 2013. Fire rings are periodically removed from City land when noted in patrols. LADWP is also working with CalFire to implement regular patrols and cite recreationists for having illegal campfires.

Example of a fire ring and palette just beyond a sign posted in the Buttermilk to remind users of fire restrictions, March 2015.

Recommendations

Boulders or other barrier devices should be placed across access roads near signage to prevent vehicle access impacting the nearby waterways and to discourage unauthorized camping, fires and associated trash.

Klondike Lake

Description

The Klondike Lake Project is an Enhancement/Mitigation Project that was adopted in 1986 to enhance an alkali sink north of Big Pine that was intermittently filled with water throughout the year. The project used water management to provide and enhance nesting and feeding habitat for waterfowl, while maintaining a lake level to support a variety of recreational activities such as boating, water skiing, swimming, and other water sports.

LADWP will coordinate with Inyo County to explore options for waste management at Klondike Lake and may pursue trash and toilet facilities (operation and maintenance would be the responsibility of Inyo County).

Status

Beginning in 2010, LADWP began requiring inspections of watercraft to prevent the infestation of quagga and zebra mussels at LADWP facilities. As a consequence, watercraft access to Klondike Lake is permitted each summer from Memorial Day to Labor Day and is regulated by LADWP. Vehicles without watercraft can still access the lake unrestricted year-round. To date, there has been no progress on improving sanitation facilities in this area through Inyo County.

Projects Applicable to the Entire Management Area

Description

Many roads are in need of repair, closing and/or rerouting on City lands were multiple roads lead to the same destination. LADWP will implement changes in road networks on City lands that are financially feasible and can be conducted with current Department Watershed Resources and Construction personnel. In some cases, ripping and seeding reclaimed road surfaces is recommended in order to achieve particular goals; in other cases, simply blocking access to a road is more appropriate. These changes will be implemented on a priority basis, and will be monitored periodically by LADWP personnel.

Status

In progress. Road closures have been/will be completed on an as-needed basis.

7.8 Owens Valley Land Management Plan References

City of Los Angeles Department of Water and Power (LADWP), the County of Inyo, the California Department of Fish and Game, the California State Lands Commission, the Sierra Club, the Owens Valley Committee. 1997. *Memorandum of Understanding between the City of Los Angeles Department of Water and Power the County of Inyo, the California Department of Fish and Game, the California State Lands Commission, the Sierra Club, the Owens Valley Committee. Los Angeles Department of Water and Power, Bishop, California.*

City of Los Angeles Department of Water and Power (LADWP) and Ecosystem Sciences. *2010. Final Owens Valley Land Management Plan.* City of Los Angeles Department of Water and Power, Bishop, CA.

City of Los Angeles Department of Water and Power (LADWP). 2010. *Initial Study and Mitigated Negative Declaration for Owens Valley Land Management Plan.* Environmental Document prepared for CEQA compliance. Los Angeles, California, March 2010.

Garcia and Associates. 2010. Final Report. *Paleontological Identification and Evaluation Report and Recommended Mitigation Measures for the Los Angeles Department of Water and Power's Stockwater Wells Installation for the Owens Valley Land Management Plan, Inyo County, California.* Prepared for the Los Angeles Department of Water and Power by Garcia and Associates, subcontractor of MWH. San Anselmo, CA. March 2010.

McCombs Archaeology. 2006. Class III Heritage Resources Survey for the Riparian Corridor of the Middle Owens River Project. McCombs Archaeology, Taylorsville, CA.

Section 7. Appendix A. Range Trend

Transect	ABERDEEN_30							
Frequency	Species	2002	2003	2004	2007	2009	2010	2012
Annual Forb	2FORB	37.4	0	0	0	0	0	0
	ATPH	0	3	0	0	0	0	0
	ATTR	0	82	76	0	0	0	0
	CLOB	0	2	0	0	0	0	0
	GILIA	0	8	0	0	0	0	0
Perennial Forb	OENOT	0	12	4	0	0	0	0
Perennial Graminoid	SPAI	81.6	57	68	59	60	60	70
Shrubs	ATTO	8.5	51	51	34	64	58	48
	SAVE4	0	0	3	0	0	0	0
Nonnative Species	BAHY	0	3	3	0	0	0	0
	SCAR	0	58	3	0	0	0	0
	SATR12	6.8	122	127	0	0	4	0
Nonnative	SATR	0	0	0	0	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2003	2004	2007	2009	2010	2012
ATCA	0	0	0.35	0.8	0.75	0.72
ATTO	2.6	6.35	37.3	40.75	46.65	42.12
SAVE4	6.2	7.3	6.85	5.3	8.85	5.47
Total	8.8	13.65	44.5	46.85	56.25	48.31

Transect_Name	ABERDEEN_33							
Frequency	Species	2002	2003	2004	2007	2009	2010	2012
Annual Forb	2FORB	0	0	3	0	0	0	0
	ERIAS	0	3	18	0	0	0	0
	GILIA	0	0	6	0	0	0	0
Perennial Forb	STEPH	3.4	3	4	0	0	0	0
	STPA4	0	0	0	2	0	0	0
Perennial Graminoid	DISP	0	6	8	5	6	6	8
	ELEL5	0	8	4	0	0	0	0
	JUBA	0	0	0	0	0	0	0
	SPAI	103.7	111	111	111	103	90	96
Shrubs	ARTRW8	0	0	0	0	0	0	0
	ATCO	1.7	14	9	24	13	12	12
	ATTO	3.4	0	0	0	0	0	0
	EPNE	5.1	1	2	0	1	0	0
	ERNA10	0	5	3	5	2	0	0
	MACA17	0	0	0	0	2	0	0
	SAVE4	0	0	0	0	0	0	0
	ARTR2	37.4	45	36	34	35	29	26
Nonnative Species	BRTE	0	0	0	0	4	0	0
	BRRU2	0	0	0	0	2	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2003	2004	2007	2009	2010	2012
ARTR2	17.34	7.5	13.55	13.85	14.2	12.1
ATCO	1.7	0.6	3.45	1.9	2.6	1.24
EPNE	0	0	0	0.4	0	0.2
EPVI	0.41	0	0	0	0	0
ERNA10	0.44	0	0	0	0	0
Total	19.89	8.1	17	16.15	16.8	13.54

Transect	CASHBA_10			
Frequency				
Life Forms	Species	2007	2009	2014
Perennial Forb	CIOC2	2	0	0
	GLLE3	3	0	0
	NIOC2	26	20	25
Perennial Graminoid	DISP	100	103	103
	JUBA	5	1	5
	LETR5	9	8	1
	SPAI	73	88	87
Shrubs	SAVE4	2	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Transect	CASHBA_11			
Frequency				
Life Forms	Species	2007	2009	2014
Annual Forb	ATPH	0	0	3
	ATTR	0	0	3
Perennial Forb	ASTRA	0	0	0
	CIOC2	0	4	0
	GLLE3	3	5	4
Perennial Graminoid	DISP	93	90	75
	JUBA	28	23	9
	LECI4	0	5	0
	LETR5	0	0	5
	SPAI	47	34	53
Shrubs	ATTO	0	1	4
	ERNA10	1	0	1
Nonnative Species	BAHY	0	0	1
	CADR	7	2	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2007	2009	2014
ATCO	0	0.45	0
ATTO	0.5	0.15	3.33
ERNA10	0	0.3	3.85
Total	0.5	0.9	7.18

Transect	CASHBA_13			
Frequency				
Life Forms	Species	2007	2009	2014
Perennial Forb	GLLE3	1	0	0
	NIOC2	0	1	2
Perennial Graminoid	CAREX	2	0	0
	DISP	162	152	164
	LETR5	25	24	22
Shrubs	ERNA10	0	1	2

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2009	2014
ERNA10	0.2	1.35

Transect	INTAKE_01							
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2012**
Annual Forb	2FORB	0	0	1	0	0	0	0
	ATPH	0	18	5	0	0	0	0
	ATTR	0	0	2	0	0	0	0
	CHST	0	2	0	0	0	0	0
	CLEOM2	0	2	0	0	0	0	0
	CLOB	0	3	0	0	0	0	0
	CRCI2	0	0	7	0	0	0	0
	ERIAS	0	23	0	0	0	0	0
	ERIOG	0	5	0	0	0	0	0
	ERMA2	0	0	2	0	0	0	0
	MEAL6	0	0	10	0	0	0	0
	CLPL2	0	0	0	0	0	5	0
Perennial Forb	MACA2	17	0	0	0	0	11	0
	MALAC3	0	2	1	0	0	0	0
	STEPH	0	18	16	0	0	0	0
	SUMO	3.4	4	4	2	2	2	0
Perennial Graminoid	DISP	59.5	54	67	52	82	59	92
	JUBA	13.6	19	15	11	11	8	14
	SPAI	96.9	117	103	105	109	117	115
Shrubs	ATCO	23.8	15	23	19	25	11	25
	ATPA3	0	0	0	1	1	2	0
	ATTO	0	10	8	6	3	11	3
	ERNA10	8.5	22	27	26	28	17	12
	MACA17	0	0	0	14	18	0	10
Nonnative Species	BAHY	0	0	0	0	10	10	0
	BRTE	0	0	1	0	0	0	0
	POMO5	0	3	0	0	0	0	0
	BRRU2	0	0	0	0	1	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2012**
ATCO	1.15	0.85	0.95	0.75	0.75	1.52
ATTO	0.76	1.35	1.6	1	2.35	1.07
ERNA10	1.16	3.6	3.5	4.5	2.55	2.45
SAVE4	0	0	0.25	0.15	0	0
SUMO	0	0	0	0.1	0	0.18
Total	3.07	5.8	6.3	6.5	5.65	5.22

Transect	TWINLAKES_02							
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2012**
Annual Forb	ATPH	0	2	1	0	0	2	0
	CHENO	0	2	0	0	0	0	0
	CHHI	0	0	2	0	0	0	0
	CLOB	0	8	3	0	0	0	0
	COMAC	0	0	0	0	0	1	0
Perennial Forb	NIOC2	3.4	4	2	3	5	15	14
	PYRA	0	6	2	7	9	12	2
	STEPH	0	3	0	0	0	0	0
Perennial Graminoid	DISP	74.8	61	65	60	73	80	81
	JUBA	73.1	96	103	78	72	72	76
	LECI4	0	4	16	0	0	1	0
	LETR5	3.4	4	0	0	0	0	0
	POSE	0	0	0	0	2	11	0
	SPAI	59.5	53	69	44	36	39	68
	SPGR	34	20	19	65	57	76	89
Shrubs	ATTO	0	6	5	5	0	0	0
	ERNA10	11.9	28	24	27	1	0	0
Nonnative Species	FESTU	0	3	1	0	0	0	0
	POA	0	0	0	11	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2012**
ATTO	6.4	5.9	4.3	0.32	1.05	1.17
ERNA10	18.3	15.85	13.52	0	0	0
Total	24.7	21.75	17.82	0.32	1.05	1.17

Transect	TWINLAKES_03							
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2012**
Perennial Forb	SUMO	0	0	5	11	15	2	14
Perennial Graminoid	DISP	144.5	144	141	153	163	127	158
	SPAI	0	1	5	1	2	0	0
Shrubs	ATTO	47.6	0	64	18	31	10	11
Nonnative Species	BAHY	0	37	27	0	26	38	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Transect	TWINLAKES_03					
Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2012**
ATTO	16.95	16.95	6.45	8.4	12.1	8.58
SUMO	0	0.1	2.4	0.6	0.9	1.08
Total	16.95	17.05	8.85	9	13	9.66

Transect	TWINLAKES_04								
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2012**	**2014**
Annual Forb	ATTR	0	0	9	0	0	0	0	0
	CHIN2	0	0	2	0	0	0	0	0
	CRCI2	0	0	3	0	0	0	0	0
Perennial Forb	SUMO	1.7	0	1	9	24	33	4	3
Perennial Graminoid	DISP	17	4	12	0	0	0	0	0
Shrubs	ATTO	5.1	8	27	18	13	9	3	0
Nonnative Species	BAHY	0	6	41	0	15	24	0	0
	DESO2	0	0	7	0	0	0	0	0
	SATR12	0	4	82	0	0	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2012**	**2014**
ATTO	13.6	22.4	11.15	17.85	15.7	12.49	13.55
SUMO	0	0	20	27.25	37.2	12.49	8.15
Total	13.6	22.4	31.15	45.1	52.9	24.98	21.7

Transect	TWINLAKES_05				
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**
Annual Forb	ATTR	0	156	91	0
Perennial Forb	MALE3	49.3	60	66	61
Perennial Graminoid	DISP	88.4	101	87	70
	JUBA	0	6	8	2
	LETR5	5.1	11	0	0
	SPAI	0	0	6	0
Shrubs	ATTO	17	15	45	29
	ERNA10	11.9	30	16	18
Nonnative Species	BAHY	0	18	35	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**
ATTO	4.2	2.6	8.85
ERNA10	6.5	10.15	18.95
Total	10.7	12.75	27.8

Transect	TWINLAKES_06						
Frequency	**Species**	**2006**	**2007**	**2009**	**2010**	**2012**	**2014**
Perennial Forb	HECU3	0	0	8	8	11	8
	SUMO	48	30	29	16	10	9
Perennial Graminoid	DISP	57	38	32	13	30	53
	SPAI	0	0	10	0	0	0
Shrubs	ATTO	23	20	63	71	51	36
Nonnative Species	BAHY	0	0	22	29	0	0
	SATR12	11	0	0	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2006**	**2007**	**2009**	**2010**	**2012**	**2014**
ATTO	5.4	11.3	50.15	66.55	62.75	35.88
SUMO	30.5	44.75	14.85	13.4	3.4	2.42
Total	35.9	56.05	65	79.95	66.15	38.3

Transect	BLKROC_37						
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**
Annual Forb	2FORB	0	9	0	0	0	2
	ATPH	0	4	0	0	0	3
	CLEOM2	0	0	1	0	0	0
	CLPA4	0	0	0	0	0	0
	CLPL2	0	0	0	0	0	21
Perennial Forb	CRTR5	0	0	0	9	4	0
	HECU3	0	0	2	0	0	0
	MACA2	0	0	1	0	0	3
	STEPH	0	1	6	0	0	0
	STPA4	0	0	0	12	4	0
	SUMO	0	0	4	6	13	4
Perennial Graminoid	DISP	105.4	72	115	112	107	110
	JUBA	10.2	0	0	2	0	1
	SPAI	39.1	15	33	34	28	29
Shrubs	ATCO	0	0	11	5	7	7
	ATTO	22.1	23	39	26	27	20
	ERNA10	5.1	1	23	17	14	17
	MACA17	0	0	0	0	0	0
	SAVE4	1.7	0	0	0	1	0
Nonnative Species	BAHY	0	0	13	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**
ALOC2	0	0.73	0.5	0	0.15
ATCO	0.1	1.15	0.1	1.39	0.4
ATPH	0	0	0	0	0.1
ATTO	5.6	6.15	2.86	2.38	2.35
ERNA10	3.8	2.9	2.85	3.28	6.55
SUMO	0.3	0.3	1.05	1.7	0.35
Total	9.8	11.23	7.36	8.75	9.9

Transect	TATUM_01	Northeast McCumber			
Frequency	Species	2007	2009	2010	2014
Annual Forb	ATPH	0	0	0	0
Perennial Forb	ASTER	0	0	0	0
	NIOC2	0	4	6	0
	PYRA	30	27	32	32
	CRRU3	0	0	31	0
Perennial Graminoid	CAREX	0	4	12	0
	DISP	109	106	116	115
	JUBA	65	74	57	49
	LETR5	4	0	4	0
	POSE	2	0	9	15
	SPAI	85	72	53	85
	SPGR	13	28	27	24
Nonnative Species	DESO2	0	0	4	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Transect	TATUM_02	North Horton Slough			
Frequency					
Life Forms	**Species**	**2007**	2009	2010	2014
Perennial Forb	NIOC2	6	10	10	5
Perennial Graminoid	DISP	119	132	124	105
	JUBA	0	0	0	0
	PADI6	2	0	0	0
	SPAI	54	59	65	88

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Transect	TATUM_03	Southeast McCumber Riparian			
Frequency	**Species**	**2007**	2009	2010	2014
Annual Forb	ATTR	0	0	1	0
	COMAC	0	0	0	0
	HEAN3	0	0	2	0
Perennial Forb	ASTER	0	0	1	0
	ERIGE2	5	0	0	0
	NIOC2	7	16	5	3
	PYRA	15	8	7	0
Perennial Graminoid	CADO2	4	0	0	0
	CAREX	0	0	0	14
	DISP	121	128	111	92
	JUBA	101	104	102	74
	LETR5	77	82	87	81
	SPAI	11	15	17	19
Shrubs	ATTO	14	12	0	11
Nonnative Species	BAHY	0	6	24	5
	LELA2	0	0	2	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)

Species code	2007	2009	2010	2014
ATTO	6.8	12.9	17.15	18.87
ERNA10	0.45	0.55	0	0.7
Total	7.25	13.45	17.15	19.57

Transect	TATUM_04	Northwest McCumber Riparian		
Frequency	**Species**	**2007**	**2009**	**2014**
Perennial Forb	GLLE3	0	1	0
	SUMO	0	0	1
Perennial Graminoid	DISP	11	18	29
	JUBA	17	24	2
	LETR5	2	2	0
	SPAI	107	119	124
Shrubs	ERNA10	10	3	3
Nonnative Species	BAHY	3	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2007**	**2009**	**2014**
ATTO	0.15	0	0
ERNA10	4.35	0.95	1.44
SUMO	0.45	0	0.49
Total	4.95	0.95	1.93

Transect	TATUM_05	Southwest McCumber Riparian		
Frequency	**Species**	**2007**	**2009**	**2014**
Annual Forb	ATTR	0	0	11
Perennial Forb	GLLE3	9	1	3
Perennial Graminoid	DISP	130	143	142
	JUBA	73	66	51
	LETR5	79	78	51
	SPAI	0	2	0
Shrubs	ERNA10	0	0	5

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2007**	**2009**	**2014**
ERNA10	0.4	0.8	2.94

Transect	TATUM_06	South Horton Slough		
Frequency	Species	2007	2009	2014
Perennial Forb	GLLE3	0	7	3
	NIOC2	80	94	88
	PYRA	3	0	3
Perennial Graminoid	DISP	141	165	145
	JUBA	34	34	29
	LETR5	0	92	93

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Transect	TATUM_07	East River Field			
Frequency					
Life Forms	Species	2007	2009	2010	2014
Annual Forb	CORA5	0	0	2	0
Perennial Forb	SUMO	1	1	0	0
Perennial Graminoid	DISP	2	2	2	2
	SPAI	96	96	92	118
Shrubs	ATCO	22	21	22	21
	ATPA3	2	2	1	1
	SAVE4	8	5	12	6
	TEAX	2	1	1	0
	ARTR2	0	0	2	2
	PIDE4	12	14	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)				
Species code	2007	2009	2010	2014
ARSP	0	0	1.4	0
ARTR2	0.65	0.3	0	0.95
ATCO	2.5	2.45	2.3	3.23
PIDE4	0.1	0.9	0	0
SAVE4	4.4	4.3	14.75	4.23
TEAX	0.5	0.3	0	0.55
Total	8.15	8.25	18.45	8.96

Transect	TATUM_08	East River Field			
Frequency					
Life Forms	Species	2007	2009	2010	2014
Perennial Graminoid	DISP	84	86	94	90
	JUBA	9	8	1	11
	SPAI	74	99	79	69
	SPGR	0	0	1	0
Shrubs	ATTO	3	1	2	0
	ERNA10	20	19	9	15
Nonnative Species	BAHY	0	0	1	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)				
Species code	2007	2009	2010	2014
ATTO	0.85	0.94	1.1	0.06
ERNA10	11.5	17.89	11.8	19.69
Total	12.35	18.83	12.9	19.75

Transect	TATUM_09			
Frequency				
Life Forms	Species	2007	2009	2014
Perennial Forb	ANCA10	37	44	40
	GLLE3	0	3	0
	HECU3	1	1	2
	NIOC2	5	0	3
Perennial Graminoid	DISP	111	124	97
	JUBA	10	13	10
	LETR5	0	4	3
	SPAI	17	23	19
Shrubs	ATTO	2	8	6
	ERNA10	6	7	0
Nonnative Species	BAHY	2	31	9
	LELA2	0	0	1

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)			
Species code	2007	2009	2014
ATTO	10.7	14.65	10.2
ERNA10	6.6	6.7	2.55
Total	17.3	21.35	12.75

Transect	TATUM_10		Charlie Butte Field		
Frequency					
Life Forms	Species	2007	2009	2010	2014
Perennial Forb	CALI4	0	1	0	3
	STEPH	0	7	0	0
	STPA4	0	0	12	11
	CASTI2	0	0	2	0
Perennial Graminoid	DISP	0	14	12	18
	LECI4	0	1	0	0
	SPAI	78	85	88	76
Shrubs	ATTO	21	15	6	9
	ERNA10	2	11	13	14
	SAVE4	3	0	1	1
	ARTR2	2	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)				
Species code	2007	2009	2010	2014
ATTO	3.51	5.74	6.25	4.3
ERNA10	1.1	8.47	3.9	6.05
MACA17	0	0	0.2	0
SAVE4	1	1.16	1	0.55
Total	5.61	15.37	11.35	10.9

Transect	TATUM_11	Calvert Slough Pasture			
Frequency					
Life Forms	Species	2007	2009	2010	2014
Annual Forb	ATPH	0	0	5	0
	CORA5	0	0	4	0
Perennial Forb	GLLE3	0	2	1	11
	HECU3	0	0	0	1
Perennial Graminoid	DISP	152	157	141	152
	JUBA	32	33	28	31
	LETR5	25	18	21	34
	SPAI	0	0	4	0
	SPGR	0	0	4	0
Shrubs	ATTO	3	8	10	2
Nonnative Species	BAHY	3	36	54	8

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)				
Species code	2007	2009	2010	2014
ATTO	5.05	11.85	16.55	8.8
ERNA10	0	0.08	2.35	0.95
Total	5.05	11.93	18.9	9.75

Transect	TATUM_12				
Frequency					
Life Forms	Species	2007	2009	2010	2014
Annual Forb	ATPH	0	0	8	0
Perennial Forb	NIOC2	0	3	2	1
	PYRA	0	0	0	1
	STEPH	0	0	0	0
Perennial Graminoid	DISP	140	159	146	148
	SPAI	7	11	8	8
Shrubs	ATTO	7	16	11	5
	ERNA10	0	0	0	4

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)				
Species code	2007	2009	2010	2014
ATTO	3.2	3.46	3.1	4.14
ERNA10	0	0.04	0	1.61
Total	3.2	3.5	3.1	5.75

Transect	TATUM_13		Calvert Slough Pasture		
Frequency					
Life Forms	Species	2007	2009	2010	2014
Annual Forb	CLPL2	0	0	6	1
Perennial Forb	NIOC2	0	5	0	0
Perennial Graminoid	DISP	88	79	79	90
	JUBA	5	13	4	5
	SPAI	64	57	51	63
	SPGR	0	0	3	0
Shrubs	ATTO	20	16	12	7
	ERNA10	0	3	0	0
Nonnative Species	BAHY	0	0	3	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)				
Species code	2007	2009	2010	2014
ATTO	5.35	9.98	9.1	6
ERNA10	0.1	0.12	0	0.2
Total	5.45	10.1	9.1	6.2

Transect	TATUM_14				
Frequency					
Life Forms	Species	2007	2009	2010	2014
Annual Forb	ATPH	0	0	12	1
	COMAC	0	0	13	0
Perennial Forb	ANCA10	4	5	2	6
	PYRA	1	1	0	0
	STPA4	0	3	0	0
	SUMO	0	0	0	2
Perennial Graminoid	DISP	103	124	103	111
	JUBA	19	21	20	42
	SPAI	37	37	22	48
Shrubs	ATTO	8	5	8	6
	ERNA10	3	13	10	0
Nonnative Species	BAHY	0	19	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)				
Species code	2007	2009	2010	2014
ATTO	2.15	2.52	3.15	2.18
ERNA10	6.3	7.81	6.35	4.86
SUMO	0	0	0	0.13
Total	8.45	10.33	9.5	7.17

Transect	TATUM_15	West River			
Frequency					
Life Forms	Species	2007	2009	2010	2014
Perennial Graminoid	DISP	7	7	6	8
	SPAI	92	102	97	95
	SPGR	0	0	1	0
Shrubs	ATCO	20	26	26	18
	ATTO	14	9	2	2
	ERNA10	15	3	2	6
	MACA17	0	3	0	0
	TEAX	3	2	2	3
Nonnative Species	SATR12	0	0	0	2
	BRRU2	0	0	3	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)				
Species code	2007	2009	2010	2014
ATCO	1.75	0.85	0.35	1.5
ATTO	0.75	1	0.8	1.05
ERNA10	1.25	1.55	2.85	0.55
TEAX	0	0.3	0	0.4
Total	3.75	3.7	4	3.5

Transect	TATUM_29	Calvert Slough				
Frequency	**Species**	**2002**	**2003**	**2007**	**2009**	**2010**
Annual Forb	2FORB	6.8	0	0	0	0
	CLOB	0	3	0	0	0
	CORA5	0	13	0	0	64
	ERIAS	0	3	0	0	0
Perennial Forb	STEPH	0	1	0	0	0
	SUMO	0	1	0	0	0
Perennial Graminoid	DISP	11.9	6	8	2	4
	SPAI	120.7	107	109	123	115
Shrubs	ARTRW8	0	0	0	0	0
	ATCO	0	0	0	3	0
	ERNA10	0	9	0	5	0
	SAVE4	0	2	0	0	3
	ARTR2	8.5	20	14	30	21
Nonnative Species	SATR12	0	3	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2007**	**2009**	**2010**
ARTR2	1.6	3.05	3.11	3.92
ATCO	0	0.4	0.12	0
ATTO	0.5	0	0	0
ERNA10	0.48	1.15	1.24	0.8
SAVE4	0	1	1.68	2.2
Total	2.58	5.6	6.15	6.92

Transect	MEND_02			
Frequency				
	Species	2007	2009	2014
Perennial Forb	PYRA	2	4	8
Perennial Graminoid	CAPR5	0	0	3
	DISP	137	143	130
	JUBA	25	34	32
	LETR5	14	18	19
	SPAI	45	35	54
Shrubs	ATTO	5	12	0
	ERNA10	2	0	6
	MACA17	4	0	6
	SAVE4	0	3	0
	MACAI3	0	5	0
Nonnative Species	BAHY	0	20	5
	MEOF	0	2	0
	PHAU7	1	0	1

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)			
Species	2007	2009	2014
ERNA10	0.9	0.44	1.35
SAVE4	0	0.06	0.05
Total	0.9	0.5	1.4

Transect	MEND_03			
Frequency				
	Species	2007	2009	2014
Perennial Forb	SUMO	15	5	19
Perennial Graminoid	DISP	139	151	151
Shrubs	ATTO	0	0	1
Nonnative Species	BAHY	0	9	5

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)			
Species	2007	2009	2014
ATTO	0	0.05	0.25
SUMO	2.25	7.45	12.49
Total	2.25	7.5	12.74

Transect	MEND_04			
Frequency				
	Species	2007	2009	2014
Perennial Forb	MALE3	0	1	0
Perennial Graminoid	DISP	157	152	152
	LETR5	17	26	5
Nonnative Species	BAHY	17	67	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Transect	MEND_05			
Frequency				
	Species	2007	2009	2014
Perennial Forb	GLLE3	4	0	5
Perennial Graminoid	DISP	124	108	73
	JUBA	1	4	9
	LETR5	2	2	0
	SPAI	66	63	70
Shrubs	ATTO	8	4	4
	ERNA10	16	15	17
Nonnative Species	BAHY	0	2	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)		
Species	2007	2009
ATTO	4.19	3.9
ERNA10	4.75	6.85
Total	8.94	10.75

Transect	MEND_06			
Frequency				
	Species	2007	2009	2014
Perennial Graminoid	DISP	130	131	135
	JUBA	13	19	18
	SPAI	26	38	40
Shrubs	ATTO	7	5	5
	ERNA10	3	1	1
	MACA17	0	1	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)			
Species	2007	2009	2014
ATTO	2.7	3.1	1.2
ERNA10	1	2.4	1.25
Total	3.7	5.5	2.45

Transect	MEND_07			
Frequency				
	Species	2007	2009	2014
Annual Forb	HEAN3	5	0	0
Perennial Forb	SUMO	5	4	0
Perennial Graminoid	DISP	121	124	104
	JUBA	2	1	3
	SPAI	17	20	13
Shrubs	ATCO	3	2	0
	ATPA3	0	5	1
	MACA17	0	6	5
Nonnative Species	BAHY	3	2	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)

Species	2007	2009	2014
ATPA3	0.45	0.36	0.55
ATTO	0.1	0	0
SAVE4	0.15	0	0
SUMO	0	0	0.1
Total	0.7	0.36	0.65

Transect	MEND_08			
Frequency				
	Species	2007	2009	2014
Annual Forb	ATPH	0	0	1
Perennial Forb	HECU3	6	4	4
	MALE3	6	7	7
Perennial Graminoid	DISP	109	100	108
	SPAI	48	47	49
Shrubs	ERNA10	3	4	2
Nonnative Species	BAHY	3	27	3

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)

Species	2007	2009	2014
ATTO	0.05	0	0.5
ERNA10	4.3	5.3	4
Total	4.35	5.3	4.5

Transect	MEND_09		River Riparian	
Frequency				
	Species	2007	2009	2014
Perennial Forb	GLLE3	5	2	6
	NIOC2	6	1	0
	PYRA	32	21	1
Perennial Graminoid	CAREX	4	0	0
	DISP	138	133	123
	JUBA	69	67	30
	LETR5	21	28	16
	POSE	14	0	0
	SPAI	2	4	0
Nonnative Species	BAHY	4	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)

Species	2007	2009	2014
ATTO	0.2	0	0.4
ERNA10	0	0.45	0.95
Total	0.2	0.45	1.35

Transect	MEND_10			
Frequency				
	Species	2007	2009	2014
Perennial Forb	SUMO	0	0	1
Perennial Graminoid	DISP	125	116	117
	LETR5	3	3	0
	SPAI	4	3	1
Shrubs	ATTO	22	7	7
	ERNA10	4	2	1
	MACA17	7	0	0
	MACAI3	0	5	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)

Species	2007	2009	2014
ATTO	1.35	3.05	2.3
ERNA10	3.6	5.25	5.8
SAVE4	0.65	0.8	0.55
Total	5.6	9.1	8.65

Transect	MEND_11			
Frequency				
	Species	2007	2009	2014
Perennial Forb	SUMO	1	1	1
Perennial Graminoid	DISP	118	133	117
	SPAI	1	0	0
Shrubs	ATTO	14	9	9
	ERNA10	19	11	22
Nonnative Species	BAHY	0	2	9

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)

Species	2007	2009	2014
ATTO	3.05	6.35	6.4
ERNA10	10.2	13.1	12.55
SAVE4	0	0.1	0
SUMO	1.5	1.7	1.1
Total	14.75	21.25	20.05

Transect	MEND_12			
Frequency				
	Species	2007	2009	2014
Annual Forb	ATSES	0	0	3
Perennial Graminoid	DISP	163	148	139
	JUBA	9	0	0
	LETR5	12	3	7
	SPAI	6	3	15
Shrubs	ATTO	1	0	0
Nonnative Species	BAHY	2	40	1

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Transect	LACEY_01		
Frequency			
Life Forms	Species	2007	2013
Annual Forb	ATTR	1	0
	COMAC	5	0
Perennial Forb	GLLE3	8	9
Perennial Graminoid	DISP	135	102
	JUBA	50	30
	LETR5	27	9
	SPAI	9	12
Shrubs	ATTO	3	8
	ERNA10	1	1
Nonnative Species	BAHY	20	0

Shrub Cover (m)		
Species code	2007	2013
ATTO	0.45	4.83
ERNA10	4.85	2.3
Total	5.3	7.13

Transect	LACEY_02		Triangle Field	
Frequency				
Life Forms	Species	2007	2009	2013
Perennial Forb	GLLE3	0	4	0
	NIOC2	0	0	1
	PYRA	0	0	0
Perennial Graminoid	DISP	144	133	104
	JUBA	41	25	17
	LETR5	25	22	25
	SPAI	55	40	64
Shrubs	ATTO	0	0	3
	ERNA10	6	3	3

Shrub Cover (m)			
Species code	2007	2009	2013
ATTO	0	0	0.02
ERNA10	0.25	0.2	1.2
Total	0.25	0.2	1.22

Transect	LACEY_03			
Frequency				
Life Forms	Species	2007	2009	2013
Perennial Graminoid	DISP	139	157	75
	JUBA	3	2	0
	LETR5	42	26	17
	SPAI	31	5	1
Shrubs	ALOC2	0	5	8

Shrub Cover (m)		
Species code	2009	2013
ALOC2	4.65	0
ATTO	1.2	3.34
Total	5.85	3.34

Transect	LACEY_04			
Frequency				
Life Forms	Species	2007	2009	2013
Perennial Graminoid	DISP	24	18	23
	JUBA	11	17	19
	SPAI	96	113	65
Shrubs	ATTO	3	1	3
	ERNA10	14	9	13

Shrub Cover (m)			
Species code	2007	2009	2013
ATCO	0	0.7	0
ATTO	1.75	0.95	0.97
ERNA10	10.95	15.7	18.07
SAVE4	1.25	1.1	0
Total	13.95	18.45	19.04

Frequency	LACEY_05			
Life Forms	Species	2007	2009	2013
Perennial Forb	GLLE3	22	0	19
Perennial Graminoid	DISP	73	91	81
	JUBA	34	4	35
	LETR5	66	113	70
	SPAI	82	0	78
Shrubs	ALOC2	8	0	3
	ATTO	8	0	5
	ERNA10	3	0	2
Nonnative Species	BAHY	0	3	0

Shrub Cover (m)		
Species code	2007	2013
ALOC2	1.3	0
ATTO	5.85	5.66
ERNA10	1.4	3.88
Total	8.55	9.54

Transect	LACEY_06			
Frequency				
Life Forms	Species	2007	2009	2013
Perennial Graminoid	DISP	100	100	106
	SPAI	83	83	79
Shrubs	ATTO	17	6	6
Nonnative Species	BAHY	0	1	0

Shrub Cover (m)			
Species code	2007	2009	2013
ATTO	6.95	7.45	3.76
Total	6.95	7.45	3.76

Transect	LACEY_07		
Frequency			
Life Forms	Species	2009	2013
Perennial Forb	GLLE3	44	53
	NIOC2	2	4
	PYRA	0	5
Perennial Graminoid	DISP	101	93
	JUBA	21	30
	LETR5	27	35
	SPAI	72	55

Transect	Lacey_08	Laws Holding Riparian
Frequency		
Life Forms	Species	2013
Annual Forb	HEAN3	3
Perennial Forb	ANCA10	27
	GLLE3	12
Perennial Graminoid	DISP	85
	JUBA	22
	LETR5	131
Nonnative Species	BAHY	1

Transect	LUBKIN_01			
Frequency	**Species**	**2006**	**2007**	**2009**
Annual Forb	ATPH	10	0	2
	CLPA4	12	0	0
Perennial Forb	NIOC2	0	1	0
	STPA4	7	6	0
Perennial Graminoid	DISP	69	60	25
	JUBA	75	53	45
	LECI4	0	0	0
	POSE	17	21	0
	SPAI	101	97	106
Shrubs	ALOC2	5	0	0
	MACA17	0	0	1
	SAVE4	0	1	0
Nonnative Species	SCAR	0	0	9

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2006**	**2007**	**2009**
ERNA10	4.65	5.15	3.85
SAVE4	1.9	1.25	0
Total	6.55	6.4	3.85

Transect	LONEPINE_01								
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2012**	**2013**
Annual Forb	HEAN3	0	0	0	0	2	0	0	0
Perennial Forb	ANCA10	0	0	0	0	2	0	0	0
	GLLE3	0	0	0	0	0	0	0	0
	MALE3	0	0	0	0	0	0	0	0
	PYRA	0	0	0	0	0	0	3	0
	SUMO	3.4	0	0	0	0	0	0	0
Perennial Graminoid	DISP	142.8	133	155	147	136	139	135	150
	JUBA	5.1	4	0	25	13	16	18	10
	LETR5	11.9	29	18	32	50	47	48	49
	SPAI	10.2	13	17	19	14	15	10	12
Shrubs	ATTO	1.7	4	7	3	3	0	0	0
	ERNA10	0	0	4	0	0	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2012**	**2013**
ATTO	7.13	5.2	4.7	1.8	2.95	3.19	2.85
ERNA10	2.24	2.6	2.05	0	0.1	0.65	0.63
SUMO	0.08	0	0.75	0	0	0	0
Total	9.45	7.8	7.5	1.8	3.05	3.84	3.48

Transect	LONEPINE_02								
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2012**	**2013**
Annual Forb	2FORB	0	0	0	0	0	0	0	0
	ATPH	0	0	0	0	0	0	0	0
Perennial Forb	ANCA10	0	0	0	0	0	0	0	0
	PYRA	0	0	0	0	0	0	4	2
	STEPH	0	0	0	0	0	0	0	0
Perennial Graminoid	DISP	146.2	125	142	143	164	141	152	132
	JUBA	8.5	13	20	17	14	15	15	14
	LETR5	0	0	0	3	0	1	4	1
	SPAI	64.6	78	65	64	52	65	69	48
Shrubs	ATTO	0	0	3	0	0	0	0	0
	ERNA10	0	1	4	3	1	2	3	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2012**	**2013**
ATTO	2.23	2.15	0.6	0.85	0	0.95	0
ERNA10	2.05	3.35	1.8	2.45	2	3.35	0.05
Total	4.28	5.5	2.4	3.3	2	4.3	0.05

Transect	LONEPINE_03								
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2012**	**2013**
Annual Forb	2FORB	0	1	0	0	0	0	0	0
	HEAN3	0	2	1	0	0	0	5	0
Perennial Forb	ANCA10	0	0	0	3	0	7	10	7
	GLLE3	11.9	0	7	0	5	3	2	3
	HECU3	0	0	0	0	0	0	0	2
	MALE3	6.8	3	5	2	5	3	0	5
	PYRA	6.8	0	0	0	0	0	0	0
Perennial Graminoid	DISP	151.3	148	152	152	142	137	137	130
	JUBA	39.1	59	52	41	43	34	42	29
	LETR5	34	33	31	34	52	48	54	26
	SPAI	8.5	0	10	5	4	4	5	0
Shrubs	ATTO	13.6	2	13	0	1	3	0	0
	ERNA10	0	0	2	0	4	1	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2003	2004	2007	2009	2010	2012
ATTO	13.51	13.4	6	0.8	4.85	5.6
ERNA10	1.99	2.7	0.55	2.75	0.6	0.2
SAVE4	0	0	0	3.6	0	0
Total	15.5	16.1	6.55	7.15	5.45	5.8

Transect	LONEPINE_04								
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2012**	**2013**
Annual Forb	2FORB	0	0	1	0	0	0	0	0
	ATPH	0	29	12	0	0	10	0	0
Perennial Forb	ANCA10	5.1	7	8	8	7	6	6	4
	MACA2	0	0	0	0	0	2	0	0
	NIOC2	3.4	0	0	2	2	0	0	0
	STEPH	5.1	0	11	0	5	0	0	0
	SUMO	3.4	4	6	2	3	0	0	0
Perennial Graminoid	DISP	105.4	101	114	97	88	77	87	88
	JUBA	15.3	18	25	11	15	15	23	14
	LETR5	0	0	0	0	0	0	0	0
	SPAI	47.6	63	56	69	79	84	72	60
Shrubs	ATCO	0	0	4	0	0	0	0	0
	ATTO	0	2	0	0	0	0	0	0
	ERNA10	0	2	0	0	0	0	0	0
	MACA17	0	0	0	4	0	0	0	1
Nonnative Species	BAHY	0	0	0	0	2	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2003	2004	2007	2009	2010	2012	2013
ATCO	0.14	0.55	0	0	0	0.4	0
ATTO	0	0	0	10	0.2	0	0
ERNA10	2.28	2.1	4.5	1.05	1	1.35	0
SUMO	12.41	1	0	0	1.25	1.86	0
Total	14.83	3.65	4.5	11.05	2.45	3.61	0

Transect	LONEPINE_05						
Frequency	**Species**	**2002**	**2003**	**2007**	**2009**	**2010**	**2012**
Annual Forb	ATSES	0	3	0	0	0	0
	ATTR	0	3	0	0	0	0
	ERPR4	0	0	3	0	0	0
	LACO13	0	0	5	0	0	0
	COCA5	0	0	0	0	0	4
Perennial Forb	ARLU	0	0	5	0	0	0
	GLLE3	35.7	26	49	29	37	43
	MALE3	15.3	11	16	8	0	7
Perennial Graminoid	ARPU9	0	0	5	0	0	0
	DISP	34	40	23	42	24	26
	JUBA	6.8	4	1	0	3	0
	SPAI	52.7	69	73	77	71	73
Shrubs	ATTO	42.5	40	24	21	13	9
	SAEX	3.4	0	16	8	4	9
	ARTR2	0	0	0	0	2	0
Nonnative Species	BAHY	0	16	0	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2007**	**2009**	**2010**	**2012**
ATTO	32.82	28.85	9.65	13.18	13.39
SAEX	1.54	14.45	21.1	1.52	4.04
Total	34.36	43.3	30.75	14.7	17.43

Transect	LONEPINE_06								
Frequency	**Species**	**2003**	**2004**	**2005**	**2007**	**2009**	**2010**	**2012**	**2013**
Perennial Forb	ANCA10	0	0	0	5	3	0	0	0
Perennial Graminoid	DISP	124	136	132	149	145	147	130	145
	JUBA	0	0	0	0	0	0	0	0
	SPAI	25	28	29	16	20	16	16	3
Nonnative Species	BAHY	0	0	5	0	0	3	0	0

Shrub Cover (m)	**2003**	**2004**	**2005**	**2007**	**2009**	**2010**	**2012**
ATTO	0.45	0.6	0.4	0.45	1.4	1.22	1.5
SUMO	0.09	0.25	0.2	0	0	0	0
Total	0.54	0.85	0.6	0.45	1.4	1.22	1.5

Transect	LONEPINE_07					
Frequency	**Species**	**2007**	**2009**	**2010**	**2012**	**2013**
Perennial Graminoid	DISP	150	157	160	151	140

Transect	ISLAND_06								
		Frequency							
Life Forms	Species	2002	2003	2004	2007	2008	2009	2010	2014
Perennial Forb	GLLE3	0	4	0	1	0	0	0	4
	NIOC2	0	0	0	0	2	8	6	7
Perennial Graminoid	DISP	90	62	92	103	117	132	116	124
	JUBA	5	5	5	3	5	7	7	6
	LETR5	0	0	0	1	2	0	0	0
	SPAI	105	103	105	98	104	117	76	81
Shrubs	ATTO	19	9	19	7	11	7	4	3
	ERNA10	9	0	3	1	3	7	1	2

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	Year						
Species	2003	2004	2007	2008	2009	2010	2014
ATTO	7.57	7.3	9.5	7.85	8.9	5.4	9.84
ERNA10	1.26	2.95	1.35	2.15	2.14	0.6	1.3
Total	8.83	10.25	10.85	10	11.04	6	11.14

Transect	ISLAND_08								
		Frequency							
Life Forms	Species	2002	2003	2004	2007	2008	2009	2010	2014
Annual Forb	2FORB	0	0	6	0	0	0	0	0
	ATTR	0	0	0	0	19	0	0	0
	LACO13	0	0	0	0	5	0	0	0
Perennial Forb	FRSA	0	0	0	0	0	0	0	5
	GLLE3	7	0	7	8	5	0	2	13
	HECU3	3	0	0	0	3	4	2	6
	MALE3	0	0	0	1	0	4	2	7
Perennial Graminoid	DISP	112	77	106	90	94	86	81	129
	JUBA	32	35	37	27	34	38	31	23
	LETR5	9	18	21	8	14	19	13	13
	SPAI	29	13	15	19	7	13	23	17
Shrubs	ATTO	19	4	7	10	28	47	24	0
	ERNA10	20	15	34	24	21	25	31	0
Nonnative Species	POMO5	0	0	0	0	2	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	Year					
Species	2003	2004	2007	2008	2009	2010
ATTO	8.45	5.85	5.65	8.75	6	6.72
ERNA10	37.51	16	25.9	18.1	29.75	25.14
Total	45.96	21.85	31.55	26.85	35.75	31.86

Transect	ISLAND_09						
		Frequency					
Life Forms	Species	2006	2007	2008	2009	2010	2014
Annual Forb	ATPH	0	0	0	0	4	0
Perennial Forb	SUMO	9	1	4	1	5	1
Perennial Graminoid	DISP	144	140	152	140	143	140
Shrubs	ATTO	7	9	6	11	2	1
Nonnative Species	BAHY	2	0	3	0	5	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	Year					
Species	2006	2007	2008	2009	2010	2014
ATTO	8.6	7.0	6.6	9.8	5.4	5.5
SUMO	0.0	0.5	0.0	1.8	2.0	2.2
Total	8.7	7.5	6.6	11.7	7.3	7.7

Transect	ISLAND_10						
		Frequency					
Life Forms	Species	2006	2007	2008	2009	2010	2014
Perennial Forb	CRTR5	23	18	31	30	31	25
	FRSA	22	11	5	17	25	31
Perennial Graminoid	DISP	132	124	139	149	152	149
	SPAI	4	2	2	2	1	1
Shrubs	ATTO	6	3	7	1	1	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	Year					Burned
Species	2006	2007	2008	2009	2010	2014
ATTO	7.1	7.5	10.8	10.1	8.8	0
SUMO	0.0	0.2	0.0	0.1	0.8	0
Total	7.1	7.7	10.8	10.2	9.6	0

Transect	ISLAND_11						
		Frequency					
Life Forms	Species	2006	2007	2008	2009	2010	2014
Annual Forb	ATPH	0	0	7	4	11	0
	COMAC	0	0	9	5	41	10
Perennial Forb	ANCA10	22	23	23	18	8	21
	NIOC2	72	47	62	59	56	62
Perennial Graminoid	DISP	148	154	154	157	137	145
	JUBA	0	0	0	4	2	4
Nonnative Species	SATR12	0	0	0	3	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Transect	THIBAUT_01B	
Frequency		
Life Forms	Species	2014
Annual Forb	ATSES	2
	ATTR	11
Perennial Forb	MALE3	2
Perennial Graminoid	DISP	3
	SCAM6	47
	TYLA	3
Nonnative Species	BAHY	11

Shrub Cover (m)	Year
Plant Species	2014
ATTO	0.4
ERNA10	0.1
Total	0.5

Transect	THIBAUT_02							
Frequency								
Life Forms	Species	2002	2003	2004	2007	2009	2010	2014
Annual Forb	ATPH	0	0	0	0	0	5	0
	ATSES	0	47	5	0	0	0	0
	CHENO	0	33	0	0	0	0	0
	CHHI	0	23	3	0	0	0	0
	COMAC	0	23	0	0	0	4	0
	CORA5	0	9	0	0	0	7	0
Perennial Forb	ASTRA	0	0	4	1	0	0	0
	GLLE3	0	7	9	3	2	2	0
	PYRA	5	10	3	12	8	5	0
	SUMO	0	1	0	0	0	0	0
Perennial Graminoid	DISP	155	153	154	159	151	161	117
	JUBA	14	15	9	16	1	9	2
	SPAI	139	132	137	140	139	136	110
Shrubs	ALOC2	0	0	0	0	0	5	0
	ATTO	0	2	10	2	3	26	2
	ERNA10	7	8	13	18	8	9	7
Nonnative Species	BAHY	0	16	39	0	3	8	2

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	Year					
Plant Species	2003	2004	2007	2009	2010	2014
ALOC2	0.0	0.0	0.0	0.0	0.4	0.0
ATTO	0.0	0.4	0.0	0.6	0.2	0.0
ERNA10	4.9	0.3	1.1	0.0	1.1	3.3
Total	4.9	0.7	1.1	0.6	1.7	3.3

Transect THIBAUT_03

Life Forms	Species	Frequency 2002	2003	2004	2007	2009	2010	2014
Annual Forb	ATSES	0	17	0	0	0	0	0
	CHHI	0	2	0	0	0	0	0
	CORA5	0	15	2	0	0	8	0
Perennial Forb	GLLE3	51	26	37	34	26	28	8
	MACA2	0	0	0	0	0	8	0
	PYRA	0	0	0	0	2	0	0
	STEPH	3	7	13	0	0	0	0
Perennial Graminoid	DISP	128	147	139	121	149	146	122
	JUBA	15	14	5	11	9	16	1
	SPAI	136	141	149	133	140	137	97
Shrubs	ATTO	2	5	11	0	3	6	0
	ERNA10	12	16	36	10	5	6	0
	MACA17	0	0	0	7	5	0	0
	SAEX	0	0	0	5	0	0	0
Nonnative Species	BAHY	0	0	0	0	2	0	0
	SATR12	0	0	0	0	3	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m) Plant Species	Year 2003	2004	2007	2009	2010	2014
ERNA10	6.5	3.1	2.7	2.2	1.3	1.6

Transect THIBAUT_04

Life Forms	Species	Frequency 2002	2003	2004	2007	2009	2010	2012	2013	2014
Annual Forb	ATTR	0	0	15	0	0	0	0	0	0
	CHHI	0	7	5	0	0	0	0	0	0
Perennial Forb	HECU3	0	0	0	0	0	0	0	0	4
	MALE3	0	0	5	0	0	0	0	0	0
Perennial Graminoid	DISP	0	0	0	0	0	0	0	1	0
Shrubs	ATTO	9	13	19	37	43	48	16	38	13
Nonnative Species	BAHY	0	2	30	0	0	58	0	0	10
	SATR12	0	10	15	0	0	0	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m) Plant Species	Year 2003	2004	2007	2009	2010	2012	2013	2014
ATTO	10.2	6.7	34.6	46.8	48.1	25.4	22.9	26.9
Total	10.2	6.7	34.6	46.8	48.1	25.4	22.9	26.9

Transect	THIBAUT_05										
		Frequency									
Life Forms	Species	2002	2003	2004	2005	2007	2009	2010	2012	2013	2014
Annual Forb	CHHI	0	0	0	1	0	0	0	0	0	0
	CHIN2	0	6	3	0	0	0	0	0	0	0
	LACO13	0	0	0	0	0	0	0	0	0	4
	COCA5	0	0	0	0	0	0	0	0	0	4
Perennial Forb	HECU3	0	0	0	2	2	24	37	89	103	68
	MALE3	0	0	0	0	0	10	28	38	38	52
Perennial Graminoid	DISP	0	0	0	0	4	3	0	0	0	0
Shrubs	ATTO	0	7	3	4	2	1	0	0	0	0
Nonnative Species	AMAL	0	0	0	2	0	0	0	0	0	0
	BAHY	0	19	9	42	0	2	29	6	0	16
	DESO2	0	0	16	6	0	0	0	0	0	0
	TARA	0	0	3	0	0	0	0	0	0	0
	SATR12	0	16	24	19	0	0	0	0	0	4

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	Year			
Plant Species	2003	2004	2005	2007
ATTO	0.5	0.5	0.3	1.4
TARA	0.0	0.0	0.4	0.0
Total	0.5	0.5	0.7	1.4

Transect	THIBAUT_06									
		Frequency								
Life Forms	Species	2003	2004	2005	2007	2009	2010	2012	2013	2014
Annual Forb	ATRIP	0	0	1	0	0	0	0	0	0
	ATSES	0	3	9	0	0	0	0	0	7
	ATTR	5	1	3	0	0	0	0	0	0
	CHENO	2	0	0	0	0	0	0	0	0
	CHHI	0	0	4	0	0	0	0	0	0
	CHIN2	0	0	3	0	0	0	0	0	0
	GITR	0	0	5	0	0	0	0	0	0
	LACO13	0	0	0	0	0	0	0	0	9
	MEAL6	0	14	72	0	0	0	0	0	0
Perennial Forb	HECU3	1	0	0	0	51	46	69	47	38
Perennial Graminoid	DISP	2	2	2	3	15	14	28	39	38
	SPAI	2	3	3	5	4	2	1	6	5
Shrubs	ATTO	11	8	9	3	0	1	2	0	2
Nonnative Species	BAHY	0	2	1	0	10	88	16	0	65
	DESO2	0	19	3	0	0	0	0	0	0
	SATR12	17	60	52	0	6	0	5	0	34

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	Year								
Plant Species	2003	2004	2005	2007	2009	2010	2012	2013	2014
ATTO	0.7	1.1	1.8	11.1	1.7	2.4	4.3	4.5	2.5

Transect	THIBAUT_07									
		Frequency								
Life Forms	Species	2003	2004	2005	2007	2009	2010	2012	2013	2014
Annual Forb	2FORB	0	1	0	0	0	0	0	0	0
	ATSES	2	24	81	0	0	0	0	0	3
	ATTR	26	15	49	0	0	0	0	0	0
	GITR	0	0	3	0	0	0	0	0	0
Perennial Forb	HECU3	1	0	1	0	0	0	0	0	0
	MALE3	7	2	0	9	2	0	6	12	46
Perennial Graminoid	DISP	3	3	0	4	0	0	0	0	0
Shrubs	ATTO	7	16	20	8	18	17	7	1	1
Nonnative Species	BAHY	12	34	37	0	0	92	3	0	23
	DESO2	0	15	34	0	0	0	0	0	0
	SATR12	16	47	45	0	0	0	3	0	6

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Thibaut_08 shelved

Thibaut_09 shelved

Transect	INTAKE_01							
Frequency	Species	2002	2003	2004	2007	2009	2010	2012
Annual Forb	2FORB	0	0	1	0	0	0	0
	ATPH	0	18	5	0	0	0	0
	ATTR	0	0	2	0	0	0	0
	CHST	0	2	0	0	0	0	0
	CLEOM2	0	2	0	0	0	0	0
	CLOB	0	3	0	0	0	0	0
	CRCI2	0	0	7	0	0	0	0
	ERIAS	0	23	0	0	0	0	0
	ERIOG	0	5	0	0	0	0	0
	ERMA2	0	0	2	0	0	0	0
	MEAL6	0	0	10	0	0	0	0
	CLPL2	0	0	0	0	0	5	0
Perennial Forb	MACA2	17	0	0	0	0	11	0
	MALAC3	0	2	1	0	0	0	0
	STEPH	0	18	16	0	0	0	0
	SUMO	3.4	4	4	2	2	2	0
Perennial Graminoid	DISP	59.5	54	67	52	82	59	92
	JUBA	13.6	19	15	11	11	8	14
	SPAI	96.9	117	103	105	109	117	115
Shrubs	ATCO	23.8	15	23	19	25	11	25
	ATPA3	0	0	0	1	1	2	0
	ATTO	0	10	8	6	3	11	3
	ERNA10	8.5	22	27	26	28	17	12
	MACA17	0	0	0	14	18	0	10
Nonnative Species	BAHY	0	0	0	0	10	10	0
	BRTE	0	0	1	0	0	0	0
	POMO5	0	3	0	0	0	0	0
	BRRU2	0	0	0	0	1	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2003	2004	2007	2009	2010	2012
ATCO	1.15	0.85	0.95	0.75	0.75	1.52
ATTO	0.76	1.35	1.6	1	2.35	1.07
ERNA10	1.16	3.6	3.5	4.5	2.55	2.45
SAVE4	0	0	0.25	0.15	0	0
SUMO	0	0	0	0.1	0	0.18
Total	3.07	5.8	6.3	6.5	5.65	5.22

Transect	4J_02		South River Field		
Frequency	Species	2007	2009	2010	2012
Perennial Forb	ARSP	0	1	0	0
	ASFA	4	3	3	0
	GLLE3	6	8	11	12
	ARDR4	0	1	1	0
Perennial Graminoid	DISP	69	83	57	45
	HOJU	0	0	0	1
	JUBA	65	51	66	61
	LETR5	33	40	50	53
	SPAI	90	65	79	66
Shrubs	ATTO	0	0	0	1
Nonnative Species	BAHY	0	12	22	3
	DESO2	0	0	0	0
	LOCO6	2	0	0	3

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2007	2009	2010	2012
ATTO	1.45	2.15	2.3	1.27
Total	1.45	2.15	2.3	1.27

Transect	4J_03		South River Field		
Frequency	Species	2007	2009	2010	2012
Annual Forb	ATPH	0	0	2	0
	CLPA4	0	0	1	0
	CLPL2	0	0	25	0
Perennial Forb	STPA4	4	4	6	2
Perennial Graminoid	DISP	137	136	137	143
	SPAI	46	48	44	34
Shrubs	ATTO	3	0	0	3
	SAVE4	8	4	2	3

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2007	2009	2010	2012
ATTO	0.2	0	0.75	0.3
SAVE4	0.5	1.55	2	2.15
Total	0.7	1.55	2.75	2.45

Transect	4J_04				
Frequency	Species	2007	2009	2010	2012
Perennial Forb	GLLE3	3	0	0	3
	NIOC2	18	18	22	18
Perennial Graminoid	DISP	144	126	134	152
	LECI4	5	0	0	0
	LETR5	24	27	27	16
	SPAI	30	30	36	24
Shrubs	ATTO	0	2	0	0
	ERNA10	0	0	0	5

(shaded cell) indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2007	2009	2010	2012
ATTO	1.4	2.1	8.42	1.51
ERNA10	1	0	0	0.64
Total	2.4	2.1	8.42	2.15

Transect	DELTA_01							
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
Annual Forb	CORA5	0	0	0	0	0	0	2
Perennial Forb	ANCA10	5.1	12	5	7	11	9	10
	NIOC2	10.2	5	7	4	3	8	5
	SUMO	6.8	0	1	0	0	0	0
Perennial Graminoid	DISP	156.4	152	149	152	155	151	150
	JUBA	0	7	11	10	9	6	6
	LETR5	0	1	0	0	0	0	0
	SPAI	3.4	0	13	11	16	11	10
Shrubs	ATTO	1.7	5	1	5	0	0	0
Nonnative Species	BAHY	0	0	2	0	2	1	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
ATTO	3.14	1.8	3.85	1.05	0.25	0.11
SUMO	0.87	0.85	0.25	0.1	0	0
Total	4.01	2.65	4.1	1.15	0.25	0.11

Transect	DELTA_02							
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
Perennial Graminoid	DISP	108.8	118	131	103	115	114	89
Shrubs	ATTO	10.2	13	0	0	4	8	8
	ERNA10	10.2	9	12	0	1	4	3
Nonnative Species	BAHY	0	3	0	0	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
ATTO	16.25	9.75	10.05	8.25	3.85	11.58
ERNA10	15.98	12.25	11.7	10.75	8.9	6.55
SUMO	0.37	0	0	0	0	0
Total	32.6	22	21.75	19	12.75	18.13

Transect	DELTA_03							
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
Perennial Forb	SUMO	15.3	15	19	0	15	22	12
Perennial Graminoid	DISP	113.9	118	129	104	119	112	122
	SPAI	5.1	0	0	1	0	0	2
Shrubs	ATTO	11.9	13	8	0	8	8	2
	ERNA10	0	0	0	0	2	0	0
	SAVE4	0	0	10	0	0	0	1
Nonnative Species	BAHY	0	1	0	0	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
ATTO	10.99	7.75	10.9	7.25	4.75	5.23
ERNA10	0.7	0.4	1.15	0.75	0.8	0.4
SAVE4	6.55	6.3	5.9	5.85	5.1	3.99
SUMO	17.19	5.2	3.7	9.55	11.25	5.1
Total	35.43	19.65	21.65	23.4	21.9	14.72

Transect	DELTA_04							
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
Annual Forb	ATPH	0	7	0	0	4	4	0
Perennial Forb	SUMO	0	7	0	0	1	0	5
Perennial Graminoid	DISP	139.4	128	150	103	115	124	116
	SPAI	0	5	6	0	0	0	0
Shrubs	ATTO	3.4	2	6	0	0	4	0
	SAVE4	0	0	0	0	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
ATTO	3.62	2.25	3.1	5.32	6.05	1.67
SAVE4	0.29	0.65	0.2	0.2	0.9	0.02
SUMO	1.94	0.9	1.75	2.55	1.4	1.32
Total	5.85	3.8	5.05	8.07	8.35	3.01

Transect	DELTA_05							
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
Annual Forb	HEAN3	0	2	0	0	0	0	0
Perennial Forb	ANCA10	0	0	1	3	8	4	7
	NIOC2	6.8	0	2	0	0	2	6
	SUMO	13.6	2	23	19	16	20	11
Perennial Graminoid	CADO2	0	2	5	0	0	0	0
	CAREX	0	0	0	0	4	0	0
	DISP	154.7	146	163	135	144	142	135
	JUBA	8.5	9	12	13	23	23	13
	SCAM6	0	0	0	0	0	5	3
Shrubs	ATTO	0	6	5	0	1	0	0
Nonnative Species	BAHY	0	1	3	0	1	0	0
	LASE	0	10	0	0	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
ATTO	6.54	3.4	4.77	5.9	6.13	2.56
ERNA10	0	0	0.6	1.15	1.04	0
SUMO	12.67	7.15	6.85	6.7	9.43	3.21
Total	19.21	10.55	12.22	13.75	16.6	5.77

Transect	DELTA_06							
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
Annual Forb	ATPH	0	0	0	0	5	0	0
Perennial Forb	ANCA10	8.5	5	5	7	6	10	7
	HECU3	8.5	7	8	2	0	0	0
	NIOC2	0	0	0	0	0	1	3
	SUMO	15.3	14	27	6	18	17	18
Perennial Graminoid	DISP	122.4	94	120	125	120	105	101
	JUBA	17	12	14	12	11	9	5
Shrubs	ATTO	3.4	4	0	2	2	0	1
	ERNA10	0	3	0	0	0	0	0
	SAVE4	0	1	15	0	4	3	2
Nonnative Species	BAHY	0	5	0	0	0	0	0
	XAST	0	2	0	0	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
ATTO	8.17	4.5	5.9	4.87	4	1.03
ERNA10	0.4	0.55	0.6	0	0	0
SAVE4	8.26	6.61	6.5	8.67	8	7.66
SUMO	9.39	3.9	10.6	7.02	7.6	7.85
Total	26.22	15.56	23.6	20.56	19.6	16.54

Transect	DELTA_07							
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
Perennial Forb	SUMO	32.3	16	15	12	15	18	9
Perennial Graminoid	DISP	113.9	93	116	102	121	121	107

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
SUMO	25.09	10.25	27	32.8	33.11	17.93

Transect	COLOSEUM_02						
Frequency	**Species**	**2003**	**2004**	**2007**	**2009**	**2010**	**2012**
Annual Forb	ATPH	36	0	0	0	31	3
	CLEOM2	7	0	0	0	0	0
	CLOB	2	3	0	0	0	0
	CORA5	0	0	0	0	2	0
	PSRA	4	0	0	0	0	0
Perennial Forb	MACA2	0	0	0	0	9	0
	PYRA	4	14	0	0	0	0
	STEPH	11	0	0	0	0	0
	PSATH	0	0	0	3	0	0
Perennial Graminoid	DISP	93	116	110	93	100	98
	JUBA	16	26	25	18	27	17
	POSE	0	0	5	0	0	0
	SPAI	27	24	35	41	41	40
Shrubs	ATCO	0	2	0	0	0	0
	ATTO	0	0	1	0	0	0
	ERNA10	0	19	0	3	4	0
	LEFR2	0	0	1	2	0	0
	MACA17	0	0	13	10	0	10
	SAVE4	3	17	7	8	1	5
	ARTR2	0	2	0	1	0	0
Nonnative Species	PHAU7	0	0	0	0	1	0
	POA	3	0	0	0	0	0

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2012**
ARTR2	0.71	0.35	0.3	0.35	0.7	0.2
ATCO	0.82	0	0.35	0.6	1.35	0.25
ATPA3	0	0	0.3	0	0	0
ERNA10	5.53	3.2	6.05	4.35	7.5	5.19
SAVE4	3.27	51.9	4.15	3.9	3.25	4.55
Total	10.33	55.45	11.15	9.2	12.8	10.19

Transect	COLOSEUM_38			South East Pasture				
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2012**
Annual Forb	2FORB	0	39	0	0	0	0	0
	ATPH	0	0	3	0	8	13	0
	CORA5	0	0	10	0	0	0	0
	ERIAS	0	21	15	0	0	0	0
	ERSP3	0	0	0	0	2	0	0
Perennial Forb	STEPH	17	11	16	0	0	0	0
	STPA4	0	0	0	0	3	12	10
	STEX	0	0	0	0	0	0	3
Perennial Graminoid	DISP	13.6	21	29	6	27	25	27
	SPAI	107.1	136	123	126	133	136	138
Shrubs	ARTRW8	0	0	0	0	0	0	0
	ATCO	0	5	2	0	0	0	0
	ATPA3	0	10	0	0	0	0	0
	ATTO	8.5	7	5	0	0	0	1
	ERNA10	10.2	13	21	5	19	3	2
	MACA17	0	0	0	0	3	0	3
	SAVE4	3.4	0	0	0	1	0	1
	ARTR2	42.5	30	31	5	0	0	1
Nonnative Species	FESTU	0	2	0	0	0	0	0
	SATR12	0	0	0	0	10	1	2
	BRRU2	0	0	0	0	9	0	0

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2012**
ARTR2	9.28	4.18	0	0	0	0.12
ATCO	0.1	0	0	0	0	0
ATTO	1.77	2.05	0	0.05	0	0.23
ERNA10	1.13	0.8	0.5	0.3	0	1.31
SAVE4	0	0	0	0.3	0.2	0.24
STPA4	0	0	0	0	1.65	0
Total	12.28	7.03	0.5	0.65	1.85	1.9

Transect	CASHBA_01		
Frequency	Species	2007	2010
Annual Forb	ATTR	2	17
Perennial Graminoid	DISP	137	134
	JUBA	6	4
	LETR5	86	82
	SPAI	33	36
Shrubs	ATTO	0	2
Nonnative Species	BAHY	0	12

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Transect	CASHBA_02				
Frequency	Species	2007	2009	2010	2012
Annual Forb	ATPH	0	0	6	0
	ATTR	0	0	28	0
	CLOB	0	0	7	0
Perennial Forb	ANCA10	0	18	0	0
	GLLE3	6	17	9	5
	PYRA	0	0	0	4
Perennial Graminoid	CAREX	0	4	0	0
	DISP	72	141	60	59
	JUBA	21	9	15	4
	LETR5	0	69	0	0
	SPAI	77	21	79	79
Shrubs	ATTO	0	0	1	0
	ERNA10	0	0	2	0
Nonnative Species	BAHY	0	11	3	2
	SATR12	0	0	1	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2010	2012
ATTO	0	0.55
ERNA10	0.45	0.3
Total	0.45	0.85

Transect	CASHBA_03			
Frequency	Species	2007	2010	2012
Annual Forb	ATTR	0	5	0
	COMAC	0	2	0
Perennial Forb	ANCA10	12	0	17
	GLLE3	8	0	21
Perennial Graminoid	CADO2	4	0	0
	DISP	117	124	154
	JUBA	4	17	4
	LETR5	41	84	82
	SPAI	20	0	15
	SPGR	1	0	0
Shrubs	ROWO	0	2	0
Nonnative Species	BAHY	1	2	34

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	
Species	2010
ATTO	0.3
ERNA10	6.3
ROWO	0.65
Total	7.25

Transect	CASHBA_04			
Frequency	Species	2007	2009	2012
Perennial Forb	ANCA10	3	0	9
Perennial Graminoid	DISP	113	121	137
	JUBA	56	60	62
	LETR5	17	16	12
Shrubs	ATTO	2	0	5
Nonnative Species	BAHY	0	0	1
	PHAU7	1	3	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2009	2012
ATTO	0.2	0.53
ERNA10	0.3	0
Total	0.5	0.53

Transect	CASHBA_05			
Frequency	Species	2007	2010	2012
Annual Forb	ATPH	0	7	0
	ATTR	0	5	0
	COMAC	0	4	0
Perennial Forb	GLLE3	2	3	3
	NIOC2	2	6	3
Perennial Graminoid	DISP	101	109	74
	JUBA	39	41	38
	LETR5	0	0	1
	PADI6	5	0	0
	SPAI	39	62	57
Shrubs	ATPA3	0	0	0
Nonnative Species	BAHY	0	7	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Transect	CASHBA_05
Shrub Cover (m)	2012
ERNA10	0.09
Total	0.09

Transect	CASHBA_06				
Frequency	Species	2007	2009	2010	2012
Annual Forb	ATTR	0	0	4	0
	COMAC	0	0	9	0
Perennial Forb	GLLE3	15	13	12	6
	NIOC2	0	3	0	0
	PYRA	0	4	0	0
Perennial Graminoid	DISP	118	223	129	138
	JUBA	5	44	7	9
	LETR5	8	8	11	6
	SPAI	0	65	0	5
Shrubs	ATTO	3	7	9	9
	ERNA10	3	1	0	3
Nonnative Species	BAHY	0	0	69	9

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2007	2009	2010	2012
ATTO	0.4	3.35	6.68	7.01
ERNA10	2.2	3.65	2.35	5.65
Total	2.6	7	9.03	12.66

Transect	CASHBA_07				
Frequency	Species	2007	2009	2010	2012
Annual Forb	ATTR	0	0	17	0
	CORA5	0	0	6	0
Perennial Forb	GLLE3	16	12	20	13
	PYRA	1	0	0	0
Perennial Graminoid	JUBA	8	9	19	12
	LECI4	0	0	0	1
	SPAI	88	97	110	101
Shrubs	ALOC2	7	3	1	1
	ATTO	1	1	0	0
	ERNA10	4	6	4	5
Nonnative Species	BAHY	4	0	5	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2007	2009	2010	2012
ALOC2	1.8	0.61	0	0
ERNA10	1.75	1.93	2.65	2.77
Total	3.55	2.54	2.65	2.77

Transect	CASHBA_08			
Frequency	Species	2007	2010	2012
Annual Forb	ATPH	0	0	6
	ATTR	0	40	0
	CORA5	0	11	0
Perennial Forb	GLLE3	13	22	6
Perennial Graminoid	DISP	96	93	96
	JUBA	24	24	26
	LETR5	9	10	3
	SPAI	58	73	56
Shrubs	ATTO	9	0	11
Nonnative Species	BAHY	0	15	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2007	2010	2012
ATTO	1.8	1.1	0.5
ERNA10	0	0.1	0
Total	1.8	1.2	0.5

Transect	CASHBA_09				
Frequency	Species	2007	2009	2010	2012
Annual Forb	ATPH	0	0	1	0
	ATTR	0	0	3	0
	COMAC	0	0	13	0
	HEAN3	0	0	4	0
Perennial Forb	ASTER	0	0	10	0
	CIMO	0	0	11	0
	CIOC2	0	7	0	0
	CIRSI	13	0	0	0
	ERIGE2	0	0	0	0
	GLLE3	16	17	13	9
	PYRA	11	6	14	0
Perennial Graminoid	CAREX	21	44	0	0
	DISP	64	73	70	94
	JUBA	24	14	8	0
	LETR5	16	31	29	19
	POSE	2	0	25	0
	SPAI	78	86	96	73
Shrubs	ATTO	0	0	0	0
	ERNA10	5	2	5	2
	MACAI3	0	2	0	0
Nonnative Species	MEOF	0	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2009	2010	2012
ERNA10	0.75	0.3	3.23
Total	0.75	0.3	3.23

Transect	CASHBA_10			
Frequency	Species	2007	2009	2014
Perennial Forb	CIOC2	2	0	0
	GLLE3	3	0	0
	NIOC2	26	20	25
Perennial Graminoid	DISP	100	103	103
	JUBA	5	1	5
	LETR5	9	8	1
	SPAI	73	88	87
Shrubs	SAVE4	2	0	0

Transect	CASHBA_12				
Frequency	Species	2007	2009	2010	2012
Annual Forb	ATTR	0	0	20	0
	CORA5	0	0	4	0
Perennial Forb	GLLE3	1	2	0	3
Perennial Graminoid	DISP	90	58	67	104
	JUBA	0	0	2	0
	LETR5	0	0	0	3
	SPAI	104	115	115	112
	SPGR	0	0	3	0
Shrubs	ATTO	1	5	1	0
Nonnative Species	BAHY	0	1	19	10

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2009	2012
ATTO	0.48	1.23
Total	0.48	1.23

Transect	CASHBA_14				
Frequency	Species	2007	2009	2010	2012
Annual Forb	ATTR	0	0	18	0
	CORA5	0	0	0	0
Perennial Forb	GLLE3	14	14	14	11
	PYRA	5	5	0	0
Perennial Graminoid	DISP	16	23	7	24
	JUBA	13	7	0	2
	LETR5	3	0	3	0
	SPAI	118	132	137	130
Shrubs	ALOC2	3	6	8	7
	ATTO	4	5	1	0
	ERNA10	0	0	0	5
Nonnative Species	BAHY	0	0	2	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2007	2009	2010	2012
ALOC2	0.55	0.1	0	0
ATTO	0	0	0.2	0.01
Total	0.55	0.1	0.2	0.01

Transect	CASHBA_15				
Frequency	Species	2007	2009	2010	2012
Annual Forb	ATPH	0	0	3	0
Perennial Forb	GLLE3	15	2	5	1
	HECU3	2	2	0	0
Perennial Graminoid	DISP	83	66	79	85
	JUBA	3	0	2	0
	LETR5	15	19	23	25
	SPAI	79	99	95	81
Nonnative Species	BAHY	0	9	31	16

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2007	2009	2010	2012
ATTO	0.15	1.45	0.3	0.48
ERNA10	1.55	0.4	0.7	0.9
Total	1.7	1.85	1	1.38

Transect	CASHBA_16				
Frequency	Species	2007	2009	2010	2012
Perennial Graminoid	DISP	24	32	26	14
	SPAI	105	100	99	86
Shrubs	ATCO	0	0	8	0
	ATTO	12	5	1	5
Nonnative Species	BAHY	0	0	3	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2007	2009	2010	2012
ATTO	0.3	0.65	0.75	0.42
ERNA10	1.25	1.8	2	2.26
SAVE4	0	0	0	0.04
Total	1.55	2.45	2.75	2.72

Transect	CASHBA_17				
Frequency	Species	2007	2009	2010	2012
Annual Forb	ATPH	0	0	29	0
	ATTR	0	0	4	0
	CLOB	0	0	1	0
	COMAC	0	0	15	0
	CORA5	0	0	4	0
	CLPL2	0	0	0	1
Perennial Forb	GLLE3	0	0	0	0
	MACA2	0	0	11	0
	PYRA	0	4	4	0
	STPA4	0	0	0	5
Perennial Graminoid	DISP	67	69	47	59
	LECI4	0	0	0	0
	SPAI	107	88	91	111
Shrubs	ERNA10	3	7	1	0
	MACA17	11	0	0	0
	MACAI3	0	5	0	0
Nonnative Species	BAHY	0	0	5	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)

Species	2007	2009	2010	2012
ERNA10	2.13	4.35	2.65	3.55
Total	2.13	4.35	2.65	3.55

Transect	CASHBA_18		Slough Pasture	
Frequency	Species	2007	2009	2012
Perennial Forb	CALI4	0	0	0
	GLLE3	0	12	0
	STPA4	4	1	0
Perennial Graminoid	DISP	74	147	45
	JUBA	0	27	0
	LETR5	0	9	0
	SPAI	95	122	39
Shrubs	ATCO	18	0	4
	ATPA3	19	1	3
	ATTO	0	7	0
	ERNA10	12	10	2
	MACA17	12	0	13
	SAVE4	4	0	0
	MACAI3	0	7	0
Nonnative Species	BAHY	0	3	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2007	2009	2012
ARTR2	0	0.75	0
ATCO	1.35	0.55	2.14
ATPA3	0.7	1.3	0
ATTO	0	1.1	0
ERNA10	3.2	3.7	2.24
SAVE4	1.05	0	0
Total	6.3	7.4	4.38

Transect	CASHBA_19				
Frequency	Species	2007	2009	2010	2012
Annual Forb	ATPH	0	0	5	0
	CORA5	0	0	16	0
	ERAM2	0	0	1	0
Perennial Forb	GLLE3	5	6	10	4
	HECU3	0	0	3	0
	MACA2	0	0	4	0
	NIOC2	0	2	1	0
	STEPH	0	0	4	9
	STPA4	6	7	0	0
Perennial Graminoid	DISP	40	45	41	38
	JUBA	3	5	4	2
	SPAI	90	96	97	87
Shrubs	ATCO	7	2	4	15
	ATTO	15	11	15	0
	ERNA10	17	15	17	15
	MACA17	0	7	0	0
	ROWO	0	0	0	2

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2007	2009	2010	2012
ATCO	0	0	0	0.2
ATTO	0.5	0.35	0.15	0.23
EPNE	0	0	0.1	0
ERNA10	4.75	4.6	4.55	2.34
Total	5.25	4.95	4.8	2.77

Transect	CASHBA_20				
Frequency	Species	2007	2009	2010	2012
Perennial Forb	ASTRA	0	1	2	0
	MACA2	0	0	7	0
	STEPH	0	0	22	0
	STPA4	22	0	0	15
Perennial Graminoid	DISP	7	5	7	5
	SPAI	82	83	84	78
Shrubs	ATCO	2	1	3	0
	ATTO	8	4	3	4
	ERNA10	34	19	14	23
	MACA17	0	30	0	0
	SAVE4	8	9	10	4
	TEAX	1	1	0	0
	ATPO	0	0	0	9
Nonnative Species	BRTE	0	3	0	0
	BRRU2	0	0	68	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2007	2009	2010	2012
ATCO	0.1	0	0.25	0
ATTO	0	0.2	0	0.01
ERNA10	5.68	8.5	7.55	6.29
SAVE4	2.1	2.2	2.4	3.07
STEPH	0	0	1.75	0
Total	7.88	10.9	11.95	9.37

Transect	CASHBA_21				
Frequency	Species	2007	2009	2010	2012
Annual Forb	ATPH	0	0	3	0
	CORA5	0	0	44	0
	HEAN3	0	0	0	4
Perennial Forb	ASFA	4	2	1	3
	HECU3	3	2	3	0
	MACA2	0	0	9	0
	NIOC2	0	2	2	0
	STEPH	0	0	11	0
	STPA4	19	0	0	11
	SUMO	0	0	0	3
Perennial Graminoid	DISP	25	27	24	15
	LECI4	13	10	16	16
	SPAI	58	61	48	47
Shrubs	ATCO	4	1	2	5
	ATTO	1	0	0	0
	ERNA10	35	29	35	34
	MACA17	11	32	0	0
	SAVE4	7	2	4	8
Nonnative Species	SATR12	0	1	0	0
	BRRU2	0	0	8	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2007	2009	2010	2012
ATCO	0	0.4	0	0.05
ATTO	0.7	1	0.98	1.04
ERNA10	4.55	6	4.37	6.31
SAVE4	2	1.3	2.37	1.66
Total	7.25	8.7	7.72	9.06

Transect	CASHBA_22				
Frequency	Species	2007	2009	2010	2012
Annual Forb	ATPH	0	0	2	0
Perennial Forb	MACA2	0	0	17	0
	MALE3	0	0	1	0
	NIOC2	0	0	0	0
	STEPH	0	0	10	0
	STPA4	0	0	0	3
	SUMO	2	1	2	0
Perennial Graminoid	DISP	56	51	59	44
	SPAI	116	116	117	116
Shrubs	ATCO	19	6	7	0
	ATTO	0	2	0	0
	ERNA10	3	8	1	3
	MACA17	20	20	0	0
	MESP2	2	0	0	0
	SAVE4	4	0	4	4
	ARTR2	5	4	1	4
	LYCO2	0	0	0	2

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2007	2009	2010	2012
ARTR2	0.65	0.53	0	0.67
ERNA10	0.75	0.79	0.65	0.5
MESP2	0.2	0	0	0
SAVE4	0.05	0.62	0	0.05
SUMO	0	0.15	0	0.17
TECA2	0	0.13	0	0
Total	1.65	2.22	0.65	1.39

Transect	CASHBA_23	Slough Pasture			
Frequency	Species	2007	2009	2010	2012
Annual Forb	ATPH	0	0	13	0
	CLEOM2	0	0	0	2
	COMAC	0	0	12	0
	CORA5	0	0	21	0
Perennial Forb	MACA2	0	0	6	0
	PYRA	6	7	5	6
	STPA4	0	0	0	9
	SUMO	0	5	0	0
Perennial Graminoid	DISP	118	144	125	125
	JUBA	4	0	3	0
	SPAI	18	145	30	23
Shrubs	ATCO	0	3	0	0
	ATTO	0	25	0	0
	ERNA10	0	2	0	0
	MACA17	6	0	0	0
	SAVE4	3	1	3	6
	MACAI3	0	4	0	0
Nonnative Species	BAHY	0	0	0	2

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2007	2009	2010	2012
ATTO	0.85	3.85	0.8	0.42
ERNA10	0	1.25	0.45	0.26
SAVE4	6.45	6.32	5.8	5.11
Total	7.3	11.42	7.05	5.79

Transect	CASHBA_24			
Frequency	Species	2007	2010	2012
Annual Forb	ATPH	0	3	0
	COMAC	0	4	0
	CORA5	0	1	0
Perennial Forb	SUMO	6	5	3
Perennial Graminoid	DISP	24	35	49
	SPAI	120	132	128
Shrubs	ATCO	11	6	0
	ATTO	18	20	21
	ERNA10	7	2	3
Nonnative Species	BAHY	0	23	15

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2007	2010	2012
ATCO	0.15	0.05	0
ATTO	3.25	4.5	5.67
ERNA10	0.55	1.2	1.09
SAVE4	0.3	0.4	0.71
SUMO	0	0.1	0
Total	4.25	6.25	7.47

Transect	CASHBA_25			
Frequency	Species	2009	2010	2012
Annual Forb	ATPH	0	30	2
	CLOB	0	2	0
	COMAC	0	2	0
Perennial Forb	MACA2	0	5	0
	PYRA	0	0	3
Perennial Graminoid	DISP	87	78	78
	SPAI	116	97	99
Shrubs	ATCO	0	11	0
	ERNA10	10	5	10
	MACA17	7	0	0
	SAVE4	3	0	3

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	2009	2010	2012
ATPA3	0	0.02	0
ERNA10	0.25	1.12	1.76
SAVE4	0	0.12	0
Total	0.25	1.26	1.76

Transect	BLKROC_01							
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
Perennial Forb	HECU3	6.8	4	8	2	16	10	4
	MALE3	20.4	26	21	26	21	13	6
	PYRA	0	3	2	1	0	0	0
	SEVE2	0	0	0	0	16	0	0
Perennial Graminoid	DISP	39.1	59	69	52	57	49	53
	JUBA	27.2	39	35	24	21	18	20
	SPAI	0	4	3	4	4	4	4
Shrubs	ATTO	28.9	36	35	36	13	17	12
	ERNA10	64.6	61	57	53	52	47	32

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
ATTO	12.6	3.46	12.15	3.81	4.55	2.95
ERNA10	26.1	11.35	20.6	10.52	13.15	12.7
Total	38.7	14.81	32.75	14.33	17.7	15.65

Transect	BLKROC_02							
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
Annual Forb	ATTR	0	3	0	0	0	0	0
Perennial Forb	GLLE3	6.8	2	5	4	7	8	7
Perennial Graminoid	DISP	52.7	49	55	49	55	48	57
	JUBA	3.4	11	6	6	4	8	6
	LECI4	0	4	1	2	2	3	3
	SPAI	71.4	95	92	91	86	78	82
Shrubs	ATTO	42.5	35	41	30	27	20	26
	ERNA10	11.9	27	13	16	22	19	13
Nonnative Species	BAHY	0	5	0	0	0	0	0
	SATR12	0	0	1	0	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
ATTO	22.3	10.3	13.4	9.69	8.3	9.16
ERNA10	6	25.05	3.45	6.4	5.4	4.92
Total	28.3	35.35	16.85	16.09	13.7	14.08

Transect	BLKROC_03							
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
Annual Forb	CHHI	0	18	6	0	0	0	0
Perennial Forb	GLLE3	0	0	0	0	1	0	0
Perennial Graminoid	ARPU9	0	0	0	2	0	0	0
	DISP	52.7	47	59	42	36	18	14
	JUBA	0	0	0	0	2	0	0
	SPAI	100.3	112	117	122	128	122	124
Shrubs	ATTO	0	0	0	1	2	2	0
	ERNA10	0	6	7	4	17	8	13
Nonnative Species	LASE	0	3	3	0	0	0	0
	POMO5	0	2	0	0	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
ATTO	0	0	0.25	0	0	0
ERNA10	1.52	1.3	5.35	9.54	9.85	16.35
Total	1.52	1.3	5.6	9.54	9.85	16.35

Transect	BLKROC_04							
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
Annual Forb	CHHI	0	2	0	0	0	0	0
	COMAC	0	23	0	0	0	3	0
	HEAN3	0	8	0	4	6	12	0
Perennial Forb	ANCA10	11.9	18	17	22	22	16	21
	HECU3	0	0	0	1	3	0	0
	MALE3	13.6	3	8	10	1	0	1
	PYRA	40.8	50	44	23	28	15	18
Perennial Graminoid	CADO2	5.1	18	0	5	0	0	0
	CAREX	0	0	0	0	14	1	12
	DISP	83.3	77	70	76	62	62	65
	JUBA	88.4	113	93	73	95	89	98
	LETR5	27.2	65	43	48	70	26	35
	SPAI	69.7	30	73	59	27	56	42
	SPGR	0	0	0	0	0	0	1
Shrubs	ALOC2	5.1	0	0	0	2	1	1
	ATTO	0	5	0	0	4	3	0
	ERNA10	0	3	2	2	3	2	6
Nonnative Species	BAHY	0	12	6	0	20	30	1
	POMO5	0	2	0	0	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
ALOC2	0	0	0	0	0.4	0
ATTO	0.25	0	0	0.7	0.15	0
ERNA10	3.38	2.75	5.55	7.9	2.35	5.82
Total	3.63	2.75	5.55	8.6	2.9	5.82

Transect	BLKROC_05							
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
Annual Forb	ATPH	0	3	0	0	0	0	0
	ATSES	0	11	0	2	0	0	0
	CLEOM2	0	16	0	0	0	0	0
	COMAC	0	17	0	3	0	0	0
	HEAN3	3.4	11	0	6	0	2	0
Perennial Forb	GLLE3	0	0	0	0	0	0	4
	PYRA	32.3	45	37	5	8	3	10
	SICO2	0	2	0	0	0	0	0
Perennial Graminoid	DISP	49.3	63	49	49	78	52	55
	JUBA	6.8	14	14	10	10	6	9
	LECI4	0	0	0	0	4	0	0
	LETR5	0	0	0	0	0	4	4
	SPAI	124.1	125	115	123	111	131	124
Shrubs	ATTO	0	2	0	0	0	4	0
	ERNA10	6.8	4	1	0	1	0	0
Nonnative Species	BAHY	0	0	0	11	3	0	0
	POMO5	0	4	0	0	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
ERNA10	7.6	6.3	2.1	0.8	0.5	0.25
Total	7.6	6.3	2.1	0.8	0.5	0.25

Transect	BLKROC_06							
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
Annual Forb	ATPH	0	30	0	0	0	19	0
	CHHI	0	8	0	0	0	0	0
	CLEOM2	0	3	0	0	0	0	0
	COMAC	0	26	0	0	0	5	0
Perennial Forb	ANCA10	5.1	4	4	2	4	2	2
	PYRA	18.7	4	0	2	1	0	0
Perennial Graminoid	DISP	73.1	80	75	77	66	70	69
	JUBA	17	26	37	27	13	9	16
	SPAI	95.2	78	71	76	76	85	80
Shrubs	ATTO	0	8	9	4	10	6	2
	ERNA10	20.4	19	6	8	9	14	9
	SAEX	0	0	0	2	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
ATTO	3.33	0.75	1	2.1	1.3	3.1
ERNA10	17.31	9.15	9.9	9.55	9.75	6.9
SAEX	2.33	7.5	3.3	0.65	0.1	0.45
SALIX	0	0.6	0	0	0	0
Total	22.97	18	14.2	12.3	11.15	10.45

Transect	BLKROC_07							
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
Annual Forb	2FORB	0	0	0	0	0	0	6
	ATPH	0	32	0	0	0	18	0
	CLOB	0	9	0	0	0	6	0
	ERPR4	0	0	0	3	0	0	0
Perennial Forb	SUMO	0	0	0	0	3	0	0
Perennial Graminoid	DISP	69.7	59	71	61	75	73	78
	JUBA	17	6	12	1	4	6	1
	SPAI	91.8	68	64	76	84	67	76
Shrubs	ATTO	5.1	0	0	0	0	2	1
	ERNA10	5.1	4	3	3	4	5	4
Nonnative Species	POMO5	0	0	0	9	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
ATTO	0	0	0.5	0.15	0.3	0
ERNA10	3.58	2.85	3	1.85	1.55	2.55
SUMO	0	0.35	0.7	0.25	0	0
Total	3.58	3.2	4.2	2.25	1.85	2.55

Transect	BLKROC_09						
Frequency	**Species**	**2002**	**2003**	**2007**	**2009**	**2010**	**2013**
Annual Forb	2FORB	0	2	0	0	0	0
	COMAC	0	2	0	0	0	0
	ERAM2	0	0	2	0	0	0
Perennial Forb	APCA	0	0	4	0	0	3
	ASTER	0	0	0	0	0	0
	GLLE3	1.7	7	1	4	2	1
	STEPH	0	0	0	0	0	0
Perennial Graminoid	DISP	113.9	102	85	99	104	124
	JUBA	56.1	55	57	65	65	59
	LECI4	0	0	4	0	0	0
	LETR5	5.1	5	7	10	9	5
	SPAI	86.7	66	80	68	69	74
Shrubs	ATTO	34	46	16	24	15	9
	ERNA10	25.5	36	39	44	36	44
	MACA17	0	0	4	1	0	0
	PSAR4	0	3	0	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2007**	**2009**	**2010**	**2013**
ATTO	25.22	9.15	8.86	2.9	0.65
ERNA10	10.07	9.55	10.302	8.8	8.77
Total	35.29	18.7	19.162	11.7	9.42

Transect	BLKROC_10									
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2012**	**2013**	**2014**
Annual Forb	ATTR	0	4	0	0	0	0	0	0	0
	CHBR	0	2	3	0	0	0	0	0	0
	CHIN2	0	14	28	0	0	0	0	0	0
	MENTZ	0	14	0	0	0	0	0	0	0
Perennial Forb	HECU3	0	0	0	0	0	0	0	0	0
	MALE3	0	3	7	11	21	20	27	18	17
	SUMO	0	0	0	0	10	0	0	0	0
	STPI	0	0	4	0	0	0	0	0	0
Perennial Graminoid	DISP	0	3	0	0	0	0	2	7	9
	LETR5	0	0	0	0	0	0	9	12	19
	SPAI	0	12	18	18	21	22	17	18	22
Shrubs	ARTRW8	0	0	0	0	0	0	0	0	0
	ATTO	1.7	6	14	25	92	74	74	65	64
	SAVE4	0	0	0	0	0	3	0	0	0
	ARTR2	0	2	0	2	2	3	0	0	0
Nonnative Species	AMARA	0	6	0	0	3	0	0	0	0
	BAHY	0	3	64	0	47	24	2	4	2
	DESO2	0	0	1	0	4	0	0	0	0
	SATR12	0	0	48	0	0	0	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2012**	**2013**	**2014**
ARTR2	1.17	1.25	1.95	2.5	0	0	0	0
ATTO	2.78	5.25	16.39	52.85	59.7	51.82	46.17	37.33
ATTR	0	0	0	0	2.25	0	0	0
ERNA10	0.95	0.8	0	0	0	0	0	0
Total	4.9	7.3	18.34	55.35	61.95	51.82	46.17	37.33

Transect	BLKROC_11									
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2012**	**2013**	**2014**
Annual Forb	ATPH	0	0	2	0	0	0	0	0	0
	ATSES	0	5	0	0	0	0	0	0	0
	ATTR	0	19	7	0	2	0	0	0	0
	CHENO	0	1	0	0	0	0	0	0	0
	CHIN2	0	0	3	0	0	0	0	0	0
	GILIA	0	9	0	0	0	0	0	0	0
	MENTZ	0	2	0	0	0	0	0	0	0
Perennial Forb	MALE3	0	3	4	4	0	0	0	0	0
	SUMO	32.3	28	42	49	76	66	20	10	16
Perennial Graminoid	DISP	113.9	107	112	103	110	110	105	106	101
	SPAI	22.1	39	41	36	42	40	29	33	32
Shrubs	ATTO	37.4	95	101	53	70	72	21	22	16
	ERNA10	3.4	10	16	8	5	6	0	0	0
Nonnative Species	BAHY	0	42	38	0	59	44	0	0	2

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2012**	**2013**	**2014**
ATTO	13.56	16.5	18.25	18.9	18.7	28.323	27.57	16.77
ATTOD	0	0	0	0	0	0	0	17.6
ERNA10	3.2	5	8.05	3.1	2.6	1.55	1.1	0.7
SUMO	10.49	4.85	13.35	16.16	6.06	2.27	0	4.35
Total	27.25	26.35	39.65	38.16	27.36	32.143	28.67	39.42

Transect	BLKROC_13							
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
Annual Forb	HEAN3	0	0	0	1	2	7	3
Perennial Forb	ANCA10	6.8	5	11	13	13	16	14
	GLLE3	0	0	0	0	0	0	1
Perennial Graminoid	DISP	129.2	139	128	128	121	120	103
	JUBA	22.1	6	13	22	19	19	0
	LETR5	6.8	0	0	14	20	23	30
	SPAI	34	40	36	37	34	28	23
Shrubs	ATTO	0	12	5	8	1	5	3
	ERNA10	0	0	4	3	0	0	3

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
ATTO	4.04	3.1	8.65	7.63	8.05	5.98
ERNA10	0	0.4	2.4	2.5	2.8	4.18
Total	4.04	3.5	11.05	10.13	10.85	10.16

Transect	BLKROC_14									
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2012**	**2013**	**2014**
Annual Forb	ATTR	0	0	5	0	0	0	0	0	0
	CHENO	0	0	0	0	0	0	0	0	0
	CHIN2	0	3	3	0	0	0	0	0	0
Perennial Forb	HECU3	0	5	0	0	0	0	0	0	0
	MALE3	0	4	4	6	7	0	7	10	8
	SUMO	0	0	0	0	4	0	0	0	0
Perennial Graminoid	DISP	13.6	21	14	10	0	0	7	13	20
Shrubs	ATTO	0	4	8	11	24	27	24	24	36
Nonnative Species	BAHY	0	14	67	0	2	71	3	4	12
	DESO2	0	0	2	0	0	0	0	0	0
	SATR12	0	20	90	0	0	0	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2012**	**2013**	**2014**
ATTO	8.76	0.35	10.05	27.25	34.41	42.77	31.25	31.55
Total	8.76	0.35	10.05	27.25	34.41	42.77	31.25	31.55

Transect	BLKROC_15							
Frequency	**Species**	**2003**	**2004**	**2005**	**2007**	**2009**	**2010**	**2013**
Annual Forb	ATTR	0	0	16	0	0	0	0
	CHIN2	14	4	29	0	0	0	0
	ERAM2	0	0	5	0	0	0	0
	GITR	0	0	4	0	0	0	0
	LEFL2	0	0	3	0	0	0	0
	MEAL6	0	0	21	0	0	0	0
	NADE	0	0	1	0	0	0	0
Perennial Forb	SUMO	15	18	39	31	32	37	18
Perennial Graminoid	DISP	25	21	19	14	3	11	24
Shrubs	ATTO	48	35	80	29	47	58	39
	SAVE4	2	9	2	6	5	8	13
Nonnative Species	BAHY	6	2	17	0	23	35	0
	DESO2	0	3	10	0	0	0	0
	SATR12	0	1	2	0	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2005**	**2007**	**2009**	**2010**	**2013**
ATTO	25.4	15.1	19.25	32.9	34.81	39.85	54.74
SAVE4	10.07	8	6.6	7.6	9.1	9.84	4.65
SUMO	1.82	1.2	0.9	20.3	23.65	32.2	0
Total	37.29	24.3	26.75	60.8	67.56	81.89	59.39

Transect	BLKROC_16							
Frequency	**Species**	**2003**	**2004**	**2005**	**2007**	**2009**	**2010**	**2013**
Annual Forb	ATSES	4	0	0	0	0	2	0
	ATTR	0	0	18	0	0	0	0
	CHIN2	13	16	37	0	0	0	0
	CRYPT	0	0	3	0	0	0	0
	ERAM2	0	0	0	0	0	0	0
	ERIOG	10	0	0	0	0	0	0
	ERMA2	0	11	23	0	0	0	0
	GITR	0	0	20	0	0	0	0
Perennial Forb	MACA2	0	0	59	0	0	0	0
	SUMO	0	0	7	0	0	1	0
Shrubs	ATCO	7	0	3	4	9	8	9
	ATTO	19	23	33	31	39	55	51
	SAVE4	5	12	6	8	11	6	15
Nonnative Species	BAHY	3	7	4	0	17	40	0
	SATR12	11	41	44	0	0	8	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2005**	**2007**	**2009**	**2010**	**2013**
ATCO	0.41	0.55	0	0	0.35	3.8	0
ATTO	6.45	2.9	5.2	16.8	44.18	44.45	46.25
SAVE4	11.02	10.35	9.8	13.3	12.35	14.91	0
SUMO	0	0	0	0	0.05	0	0
Total	17.88	13.8	15	30.1	56.93	63.16	46.25

Transect	BLKROC_17							
Frequency	**Species**	**2003**	**2004**	**2005**	**2007**	**2009**	**2010**	**2013**
Annual Forb	ATSES	12	0	8	0	0	5	0
	ATTR	3	0	31	0	0	0	0
	CHIN2	13	10	40	0	0	0	0
	CHLE4	0	0	1	0	0	0	0
	CRCI2	0	0	4	0	0	0	0
	ERIOG	0	0	0	0	0	3	0
	ERWI	0	0	7	0	0	0	0
	GITR	0	0	32	0	0	0	0
	LEFL2	0	0	54	0	0	0	0
	MEAL6	0	0	29	0	0	0	0
Perennial Forb	HECU3	0	0	0	0	0	0	2
Perennial Graminoid	HOJU	0	0	2	0	0	0	0
Shrubs	ATTO	70	34	74	45	49	54	52
Nonnative Species	BAHY	0	0	0	0	0	5	0
	DESO2	0	0	6	0	0	0	0
	SATR12	9	10	6	0	3	5	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2005**	**2007**	**2009**	**2010**	**2013**
ATTO	37.52	5.65	5.6	28	37.7	69.3	66.06
Total	37.52	5.65	5.6	28	37.7	69.3	66.06

Transect	BLKROC_18							
Frequency	**Species**	**2003**	**2004**	**2005**	**2007**	**2009**	**2010**	**2013**
Annual Forb	ATSES	3	0	0	0	0	0	0
	ATTR	0	0	0	0	0	0	0
	CHLE4	0	0	5	0	0	0	0
	GITR	0	0	4	0	0	0	0
Perennial Forb	GLLE3	3	6	9	4	1	4	0
Perennial Graminoid	DISP	119	104	114	118	102	86	120
	SCAM6	0	0	0	0	0	0	8
	SPAI	4	16	20	12	21	37	17
	TYLA	0	0	0	0	3	3	0
Shrubs	ATTO	33	12	24	19	20	13	6
	ERNA10	1	2	10	1	0	5	2
Nonnative Species	BAHY	14	10	45	0	0	0	0
	SATR12	0	0	3	0	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2005**	**2007**	**2009**	**2010**	**2013**
ATTO	17.04	3.5	5.45	29.09	15.2	11.05	3.79
ERNA10	4.85	2.85	3.5	5.7	4	5.5	6.56
Total	21.89	6.35	8.95	34.79	19.2	16.55	10.35

Transect	BLKROC_19							
Frequency	**Species**	**2003**	**2004**	**2005**	**2007**	**2009**	**2010**	**2013**
Annual Forb	ATSES	4	0	0	0	0	0	0
	ATTR	0	0	2	0	0	0	0
	CHLE4	0	0	6	0	0	0	0
	GITR	0	0	5	0	0	0	0
Perennial Graminoid	DISP	139	147	139	127	143	132	122
	JUBA	13	20	6	26	21	14	24
	LETR5	3	0	1	0	0	0	0
	SPAI	9	8	12	10	10	26	9
Shrubs	ATTO	0	6	31	24	18	12	15
	ERNA10	0	3	5	0	3	3	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2005**	**2007**	**2009**	**2010**	**2013**
ATPO	0.7	0	0	0	0	0	0
ATTO	3.63	1.5	2.9	8.8	13.59	11.75	8.08
ERNA10	2	2.1	0.9	1.75	3.07	4.5	3.16
Total	6.33	3.6	3.8	10.55	16.66	16.25	11.24

Transect	BLKROC_20							
Frequency	**Species**	**2003**	**2004**	**2005**	**2007**	**2009**	**2010**	**2013**
Annual Forb	ATTR	0	0	7	0	0	0	0
Perennial Graminoid	DISP	127	147	143	126	123	123	118
	LETR5	18	29	30	31	59	70	27
	SPAI	5	4	5	5	5	0	1
Shrubs	ATTO	6	2	27	19	18	15	9
	ERNA10	0	1	1	0	3	1	1
Nonnative Species	BAHY	5	0	6	0	16	33	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2005**	**2007**	**2009**	**2010**	**2013**
ATTO	8.8	6.85	17	27.1	30.26	27.88	9.63
ERNA10	8.6	8.3	6.4	6.45	6.35	11.81	7.221
SAVE4	0	0.1	0	0.25	0.65	0.42	1.26
SUMO	0.05	0	0	0	0	0	0
Total	17.45	15.25	23.4	33.8	37.26	40.11	18.111

Transect	BLKROC_21							
Frequency	**Species**	**2003**	**2004**	**2005**	**2007**	**2009**	**2010**	**2013**
Annual Forb	ATSES	3	0	0	0	0	0	0
	ATTR	0	0	2	0	0	0	0
Perennial Forb	SUMO	4	0	3	0	0	0	0
Perennial Graminoid	DISP	135	133	142	136	130	131	126
	LETR5	0	2	5	5	8	6	66
	SPAI	1	4	3	1	4	3	0
Shrubs	ATTO	23	13	42	10	10	3	7
	ERNA10	3	1	0	1	0	0	6

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2005**	**2007**	**2009**	**2010**	**2013**
ATTO	29	20	29	24	17	16	11
ERNA10	2	4	3	8	1	0	1
SUMO	2	0	0	0	0	0	0
Total	34	25	32	32	18	16	12

Transect	BLKROC_22					
Frequency	**Species**	**2006**	**2007**	**2009**	**2010**	**2013**
Perennial Forb	SUMO	3	6	2	5	3
Perennial Graminoid	DISP	124	111	125	128	123
	SPAI	4	4	3	2	5
Shrubs	ALOC2	4	4	10	9	8
	ATTO	21	7	19	20	7
	ERNA10	5	4	11	8	2
Nonnative Species	BAHY	11	0	9	1	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2006**	**2007**	**2009**	**2010**	**2013**
ALOC2	3.35	2.35	0	5	0
ATTO	11.35	9.9	9.64	5.5	9.13
ERNA10	8	9.1	6.86	6.95	3.85
SUMO	0.9	0.55	0.57	0.15	0
Total	23.6	21.9	17.07	17.6	12.98

Transect	BLKROC_23					
Frequency	**Species**	**2006**	**2007**	**2009**	**2010**	**2013**
Annual Forb	ATSES	18	0	0	0	3
Perennial Graminoid	DISP	139	133	139	135	127
	SPAI	25	28	28	24	35
Shrubs	ATTO	0	0	0	32	1
Nonnative Species	BAHY	4	0	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2006**	**2007**	**2009**	**2010**	**2013**
ATTO	0.95	0.85	0.59	1.61	1.33
ERNA10	0	0	0	0	0.19
Total	0.95	0.85	0.59	1.61	1.52

Transect	BLKROC_39							
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
Perennial Forb	NIOC2	0	0	3	0	4	6	0
	SUMO	6.8	12	5	8	4	6	4
Perennial Graminoid	DISP	103.7	94	88	87	98	95	85
	JUBA	6.8	0	0	0	0	0	0
Shrubs	ALOC2	5.1	8	11	13	13	12	14
	ATCO	3.4	9	3	9	13	8	0
	ATTO	17	3	3	3	0	0	4
	ERNA10	0	4	0	1	0	0	0
	SAVE4	3.4	0	4	4	3	5	5
Nonnative Species	BAHY	0	2	0	0	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
ALOC2	0.1	0.2	0	0	1	0
ATCO	0.15	0.45	0.35	1.75	6.35	0
ATTO	3.35	1.9	2.4	1.28	0	0.6
ERNA10	0.12	0	0.25	0	0.3	0.3
SAVE4	1.4	0	0.1	0	1.2	0.7
SUMO	0.2	0.4	0.5	0.44	0.6	0
Total	5.32	2.95	3.6	3.47	9.45	1.6

Transect	BLKROC_44							
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
Annual Forb	ATPH	0	1	0	0	0	0	0
	ATSES	0	35	0	0	0	0	0
	CORA5	0	1	0	0	0	0	0
Perennial Forb	SUMO	3.4	7	7	8	15	15	9
Perennial Graminoid	DISP	103.7	96	104	113	114	102	108
	JUBA	20.4	14	16	7	11	0	0
	SPAI	79.9	87	83	83	82	82	93
Shrubs	ATTO	32.3	70	83	28	35	20	20
	ERNA10	17	30	32	10	24	32	30
Nonnative Species	BAHY	0	1	0	0	0	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
ATTO	19.39	11.85	10.65	10.7	9.62	9.04
ERNA10	7.71	6	11.4	10.1	8.75	10.37
SUMO	1.44	0.9	1.8	0.15	0.6	0
Total	28.54	18.75	23.85	20.95	18.97	19.41

Transect	BLKROC_49							
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
Annual Forb	ERIAS	0	3	0	0	0	0	0
	PSRA	0	0	2	0	1	0	0
Perennial Forb	MACA2	0	0	0	0	0	3	0
	OENOT	0	3	0	0	0	0	0
	STEPH	5.1	2	17	0	0	0	0
	STPA4	0	0	0	6	3	0	0
Perennial Graminoid	DISP	78.2	56	63	53	52	45	57
	SPAI	28.9	24	25	27	29	31	22
Shrubs	ATCO	20.4	15	19	21	30	24	19
	ATPA3	3.4	4	1	0	1	6	5
	ATTO	0	0	0	0	0	0	0
	ERNA10	13.6	10	7	4	10	16	15
	SAVE4	3.4	0	4	2	4	0	0

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
ATCO	0.38	0	0.2	0.72	0.2	0.55
ERNA10	1.12	1.05	2.3	1.7	0.6	1.35
MACA2	0	0.65	0	0	0	0
SAVE4	1.01	0.55	1.9	1.36	1.2	1
Total	2.51	2.25	4.4	3.78	2	2.9

Transect	BLKROC_51							
Frequency	**Species**	**2002**	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
Perennial Forb	GLLE3	32.3	2	12	27	8	5	7
	SUMO	0	0	0	2	0	0	0
Perennial Graminoid	DISP	100.3	85	70	114	73	58	51
	SPAI	34	21	27	45	18	43	36
Shrubs	ALOC2	0	0	0	1	0	0	3
	ATTO	15.3	56	42	38	8	3	4
	ERNA10	8.5	2	0	11	1	5	4
	SAVE4	0	0	0	0	0	0	2

indicates a significant difference, α≤0.1 between 2014 and prior sampling event

Shrub Cover (m)	**2003**	**2004**	**2007**	**2009**	**2010**	**2013**
ATTO	25.86	6.21	11.75	7.85	4.6	5.35
ERNA10	2.1	0.55	4.15	4.15	3.25	5.25
SAVE4	0	0	0.4	0.3	0	0
Total	27.96	6.76	16.3	12.3	7.85	10.6

Transect	YRIB_01				
Frequency	Species	2007	2009	2010	2013
Annual Forb	ATPH	0	0	6	0
	CLOB	0	0	1	0
Perennial Forb	MACA2	0	0	3	0
Perennial Graminoid	DISP	77	75	92	67
	JUBA	7	5	2	1
	SPAI	53	45	51	52
Shrubs	ATTO	2	1	0	2
	ERNA10	10	4	5	13
	MACA17	3	0	0	0
	MACAI3	0	2	0	0

Shrub Cover (m)	2007	2009	2010	2013
ATTO	0	0	1.2	1.21
ERNA10	2.9	3.6	6.45	3.42
SAVE4	0.3	0.25	0.25	0
Total	3.2	3.85	7.9	4.63

Transect	YRIB_02			
Frequency	Species	2007	2009	2010
Annual Forb	ATRIP	3	0	0
	ATSES	8	0	0
	COMAC	0	0	5
	HEAN3	53	50	12
	MEAL6	0	5	0
Perennial Forb	CALI4	2	5	0
	PYRA	9	7	2
Perennial Graminoid	CAREX	48	47	40
	DISP	46	49	77
	ELEL5	0	0	0
	HOJU	28	16	9
	JUBA	25	63	62
	LETR5	54	70	106
	MUAS	7	10	0
	POSE	7	3	0
Shrubs	ERNA10	4	0	0
Nonnative Species	BAHY	13	18	23
	CADR	11	22	13
	LELA2	50	22	0
	LOCO6	0	7	0
	MEOF	2	0	0
	POMO5	20	41	3

Shrub Cover (m)	2010
ERNA10	1.6

Transect	YRIB_03			
Frequency	Species	2007	2009	2013
Perennial Graminoid	DISP	116	144	132
	SPAI	5	10	9
Shrubs	ATTO	2	3	3
	ERNA10	4	6	5

Shrub Cover (m)	2007	2009	2013
ATTO	0.3	6.12	0.37
SAVE4	0	0.6	0
Total	0.3	6.72	0.37

Transect	YRIB_04		North 40	
Frequency	Species	2007	2010	2013
Annual Forb	ATPH	0	11	0
	COMAC	0	21	0
	CORA5	0	5	0
Perennial Forb	GLLE3	0	3	0
	PYRA	5	7	4
Perennial Graminoid	CAREX	0	14	0
	DISP	102	99	103
	JUBA	34	34	19
	LETR5	11	0	0
	SPAI	37	21	21
	SPGR	0	5	0
Shrubs	ERNA10	0	7	18

Shrub Cover (m)	2007	2010	2013
ERNA10	0.3	15.06	11.88

Transect	YRIB_05			
Frequency	Species	2009	2010	2013
Annual Forb	ATPH	0	43	0
	CLOB	0	10	0
	COMAC	0	2	0
Perennial Forb	GLLE3	3	0	0
	PYRA	17	0	0
Perennial Graminoid	CAREX	16	0	0
	DISP	93	112	102
	JUBA	28	0	0
	SPAI	21	12	11
Shrubs	ATTO	0	17	8
	ERNA10	14	0	0

Shrub Cover (m)	2009	2010	2013
ATTO	0	2.04	1.61
ERNA10	17.95	1.47	1.07
SAVE4	0	0.51	0.22
Total	17.95	4.02	2.9

Transect	YRIB_06	North 40
Frequency	Species	2013
Perennial Graminoid	DISP	49
	JUBA	1
	SPAI	64
Shrubs	ATTO	3
	ERNA10	9

Shrub Cover (m)	2013
ERNA10	4.92
Total	4.92