MITIGATION ANNUAL REPORT 2022-23

Inyo County Water Department (ICWD), Annual Report
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The format of the Mitigation section in ICWD's annual reporting has evolved over time. Previous reports were in response to LADWP's Owens Valley Report mitigation section, and we will continue with this approach. However, the emphasis in this, and upcoming reports, will be on unfinished projects, projects that are not meeting goals, and projects that are not fully accomplishing mitigation objectives. These specific projects are highlighted in the Mitigation Project Status table accompanying this report. The County and LADWP collaboratively created this table in 2017 to facilitate project tracking and to address potential differences in views on project status between the County and the City. These differences are indicated in red type in the table and are further explained in the narrative sections below. The table is dynamic, reflecting that project statuses might change over the years due to new studies, project discontinuations, transformations, or the addition of new mitigation projects.

Additionally, the Mitigation Background and Overview section, which includes project origins and background, has been transferred to the Water Department's Mitigation webpage, where you can find it on the www.inyowater.org home page, under the heading Quick Links.

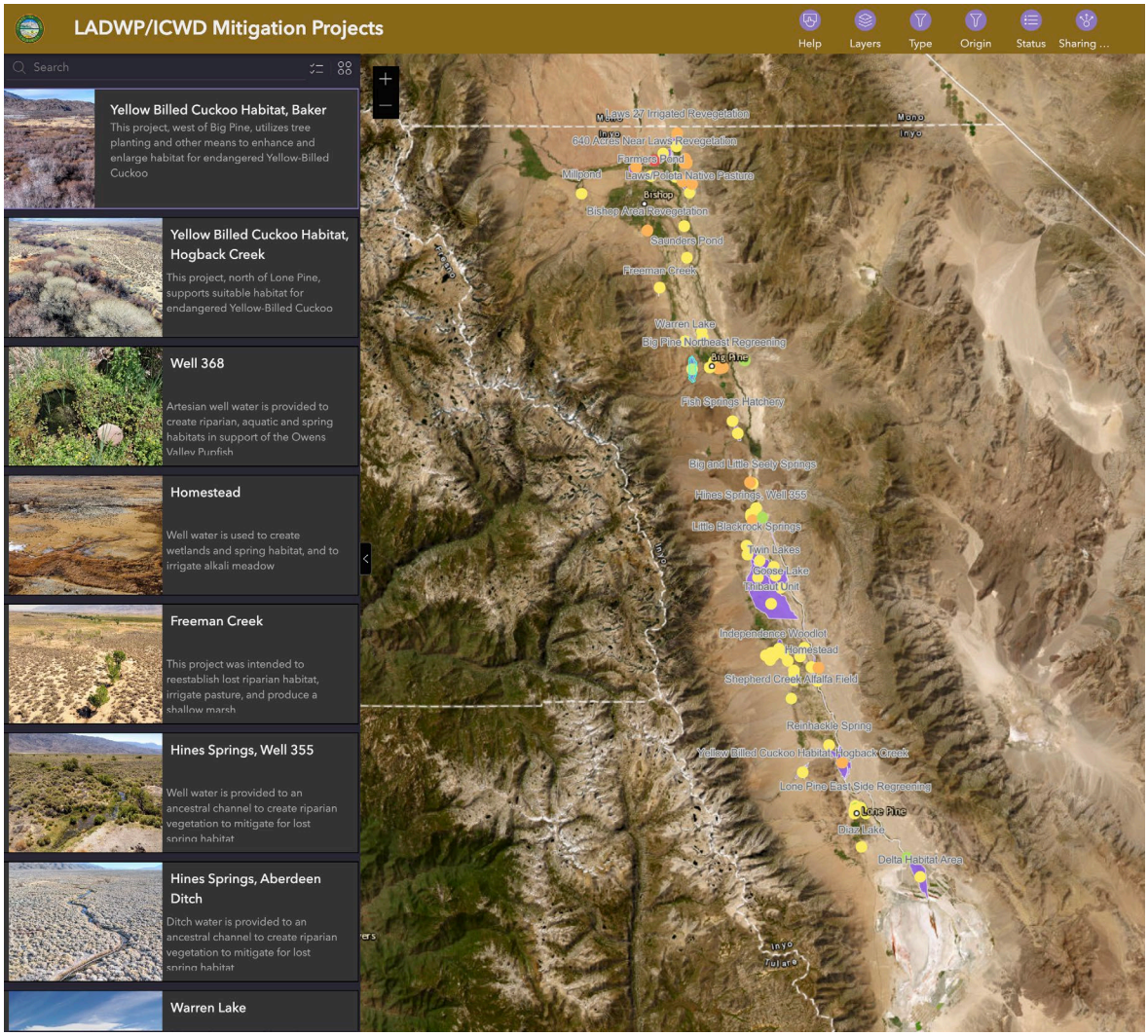
In 2022, we introduced an online, interactive Mitigation Projects Map (Figure 1). This map, accessible on the Water Department's website, home page, under Quick Links, provides a comprehensive view of all mitigation project obligations in the Owens Valley related to the Long-Term Water Agreement, Stipulations and Orders, and subsequent mitigation initiatives. This graphic depiction of the projects complements the status table. The map is an excellent resource for various users: for newcomers, it offers a click-through introduction to the projects, and for those familiar with the projects, it serves as a valuable, up-to-date reference for research and monitoring. Users can explore the geographic distribution of projects, view project site photos, and use the search function to quickly find specific projects or project types. Filters enable users to locate projects based on goals, legal origin, status relative to goals, and water delivery.

By clicking on a project's centroid point on the map, users can access information about its origin, impact, and status, as well as a description. When available, water delivery details are also included. Furthermore, users can access an Additional Information library within the pop-up, containing photos and files related to the project, including origins, scientific studies, and modifications. These files can be downloaded for offline use.

It is essential to remember that while the map provides a close approximation of project boundaries, it does not represent legal descriptions, as many were not well depicted in their

original governing documents. We plan to regularly update the map, including benchmark status updates and new files in the libraries.

Figure 1. Mitigation Map representation.



Status of the Ad Hoc Projects:

Freeman Creek and Hines Spring Projects

The 1997 MOU outlined further mitigation obligations, which in part entailed supplying 1,600 acre-feet of water annually. This water could be provided either on-site at Hines Spring or on-site, or off-site at other locations in the southern Owens Valley. To meet this obligation, an Ad Hoc group comprising representatives from the MOU Parties and area ranchers was established in February 2006. Initially, a consultant was hired to develop the Hines Spring projects, but they faced challenges in devising viable project plans, prompting the Ad Hoc group to form. The eight projects developed by the group are described in detailed in Exhibit A, titled "Additional Mitigation Projects Developed by the MOU Ad Hoc Group," accessible on the ICWD website, www.inyowater.org/projects/mitigation, under the heading “Ad Hoc Projects.”

These initiatives were implemented in 2011-12 and monitored for five years. According to LADWP, they have supplied the 1,600 acre-feet of water each year. However, lack of water, possibly due to hydrogeological constraints or insufficient runoff, has one of these projects (Freeman Creek) failing to achieve its objectives. The County has initiated preliminary investigations, and LADWP is aware that adaptive management or project substitution may be necessary to meet the objectives of the Freeman Creek project.

Another set of Ad Hoc projects appears to have turned a corner. Both the Hines Spring Aberdeen Ditch and Well 355 projects, which were seen as not having met goals, have significantly improved since the last reporting.

Freeman Creek

The Freeman Creek project aims to route a creek originating on the east flank of the Coyote Warp back into its ancestral washes, intending to revitalizing riparian habitat along the stream channel. Additionally, there was hope that the creek would serve to irrigate a downslope pasture and fill a shallow marsh. However, despite an optimistic beginning, the creek has not provided a consistent water supply, particularly in recent years. As a result, most of the vegetation that initially developed in the riparian strip shortly after project implementation has been lost (Figure 2).

The unpredictable and variable flow of the creek is well-known from the available gauge data (Table 1). To address this in project planning, a long-term average water accounting method was employed, attributing an annual flow of 215 acre-feet to the project regardless of actual annual measurements. Since the project's implementation in 2012, Freeman Creek has averaged only 123 acre-feet per year (Table 1). In recent years, gauged creek flows have diminished to the point where creek water rarely reaches the project area, and when flow is observed, it often occurs outside the growing season.

Table 1. Freeman Creek, measuring station 2054 data.

Year range	Average annual (af)	10-year total (af)
1992-2001	185	1984
2002-2011	286	2835
2012-2021*	123	1226

* From 1/1/2022-9/1/2022 no flow was recorded.

Approximately one-half mile south (upgradient) of where Freeman Creek crosses Keough Hot Springs Road, surface flow ceases, resulting in the recent decline and death of riparian vegetation, including large willow and cottonwood trees (beginning around 2020). Below this point, available groundwater is insufficient to sustain mature vegetation without project water augmentation. In the spring of 2022, sporadic new vegetation growth occurred along the creek margins, with some previously dormant (dead-appearing) trees showing growth.

The Water Department's scientists and staff have initiated an investigation into the factors that contribute to the observed fluctuations in the local hydrologic system. The following are being, or have been, considered as potential factors contributing to the observed changes in the Freeman Creek flow regime:

- Drought and wet hydrologic cycles
- Topographic gradient along the creek channel
- Surficial sedimentary lithology along the creek channel watercourse
- Owens Valley Fault Zone
- Anthropogenic creek flow diversion
- Pumping from nearby water wells

Our preliminary investigation has ruled out water diversions both upstream and in the vicinity of the point where flow reduction occurs at a diversion box. The Inyo County Sheriff's Department conducted a helicopter survey in the upper watershed to identify any potential water diversions and none were identified. At a historical diversion box, we traced and inspected a small-diameter irrigation line leading to the east, only to find it broken, abandoned, and unlikely to be contributing to the decrease in flow.

Water Department staff aims to conduct a comparison of vegetation conditions within drainages situated on the east side of the Coyote Warp. Specifically, they will qualitatively assess the vegetation in the lower stretches of Rawson Creek to the north and Shannon Canyon to the south, comparing vegetation conditions there with that of Freeman Creek.

Figure 2. Dead willow and stressed vegetation receiving some irrigation during the abnormally wet 2022-23 year (June 13, 2023).

Hines Spring Projects

At the former Hines Spring site, ditch water and pumped water are delivered to two ancestral spring channels. Hines Spring W355 is supplied by its namesake groundwater well, located just north of the now-dry spring vent, while Hines Aberdeen is supplied from water diverted from the Aberdeen Ditch. Although these geographically neighboring channels share similar goals, they have distinct water supplies. Well 355 aims to potentially harbor native fish, which could be threatened by non-native fish entering the system from the ditch water. Both the W355 and Aberdeen Ditch projects have been slow to meet their riparian objectives, and as of last year, they did not seem to be meeting their project goals. However, there have been recent improvements, and the projects are now considered to be implemented and on-going (Figure 3).

In the 2021 Annual Report, the Well 355 project was called out for not achieving its goals of enhancing aquatic, riparian, and spring-type habitat. The report noted only marginal riparian development, with vegetation improvement extending only about 700 feet, out of approximately 2,300 feet of ancestral channel. Additionally, new woody riparian growth was lacking, and there was no planting of riparian trees and vegetation. Under the plan, “plantings of riparian trees and a selection of riparian herbaceous species will be conducted along the channel using utilizing seeds from nearby sources hand collected and distributed.” This had not occurred. The Hines Spring Aberdeen Ditch project faced similar issues, with limited riparian vegetation recruitment, indicating a need for supplemental plantings.

The 2021 Annual Report also mentioned that the wet 2016-2017 runoff year raised the groundwater table into the rooting zone, initiating new riparian development and helping recover riparian habitat that had declined a few years after project implementation. In response to another exceptionally wet runoff year in 2022-2023, both Hines Spring projects appear to have improved since last year's report, but additional studies are required to determine if the projects are meeting goals.

Importantly, in 2023, the Water Department began to undertake systematic scientific studies of all of the 1600 acre-foot projects that have as goals the development of riparian and spring-type vegetation. Previously, these projects were assessed through pedestrian survey and through analysis of aerial and satellite imagery. The sustainability of this new riparian growth will be determined in the coming years, as ICWD continues to monitor these projects and provide reports if conditions change.

Figure 3. Hines Aberdeen Ditch, looking south, showing a flush of new vegetation in a rewatered ancestral spring channel (July 18, 2023)

Status of the Revegetation Projects

On November 23, 2022, the County received a report from LADWP titled "Laws Type E Revegetation Monitoring Report, Monitoring Data, and Photos; 1991 EIR Revegetation Transect Data." In the report, LADWP asserts that four of the 1991 EIR revegetation projects, described in the 1999 Revegetation Plan (1999 Plan), have been completed. Additionally, they state that the Revegetation Plans for Lands Removed from Irrigation Laws Parcels 90, 95, and 129, and Abandoned Agricultural Land Parcel 94 (Type E Transfer), have achieved cover and composition goals (Figure 4). They further propose that after a two-year rest period without irrigation, the parcels will be resurveyed in the summer of 2024, and if cover and composition goals are met again, the project will be considered complete. However, the Water Department identified several shortcomings and concerns regarding these statements and actions and raised them in a letter to LADWP, dated March 23, 2023. These concerns include:

1999 Revegetation Plan Projects

Regarding the 1999 Plan projects, LADWP claimed to have achieved project goals at a number of the mitigation sites based on cover and composition measurements, but the 1999 Plan requires evidence of natural recruitment, which LADWP has not analyzed or documented. Over the years, the Water Department advised LADWP that any project claim must be evidence-based and align with 1999 Plan stipulations, including ongoing natural recruitment and site self-sustainability. We offered LADWP a monitoring technique to assess sustainability, which is under consideration along with LADWP's preferred method, which was initiated by DWP on July 27, 2023.

It is important to highlight that DWP's survey for sustainability coincides with one of the wettest growing seasons on record. Surveys conducted in such wet years likely introduce bias. DWP's past monitoring of revegetation sites were frequently conducted during wet periods. This is significant because relying solely on measurements from wet years might inaccurately forecast the long-term success of revegetation. In wet years, plant canopies expand to an extent not seen in drier years. Investigations under such conditions yield abnormally high cover values not representative of average or drought years. Similarly, new plant recruitment seen during consecutive wet years could have resulted from unusually favorable conditions, but under normal or drought conditions these starts might not persist.

The County and DWP continue to collaborate to establish a monitoring framework that fulfills the 1999 Plan's sustainability objectives through rigorous scientific evaluation. In terms of study approaches, both parties are largely aligned in their belief that fenced areas which have naturally undergone revegetation and have successfully achieved the stipulated cover and composition targets, as gauged by LADWP, and validated by the County, may not necessitate additional monitoring to gauge sustainability. These lands had revegetated naturally, on their own over the decades and are expected to continue to thrive. In other cases, where deliberate revegetation initiatives have been undertaken through irrigation and/or seed planting, and plant cover and species richness goals have been achieved, a more comprehensive analysis will be required to

evaluate long-term sustainability. Various methodologies for conducting such analyses are presently being considered. In the final case, parcels that have been actively revegetated but are not meeting goals will be assessed using plot-based method that, once agreed upon, could be implemented in the next growing season (Figure 4).

Figure 4. Big Pine 160 revegetation project. An example of active and passive revegetation efforts (May 4, 2022)

Type E Transfer Projects (Figure 5)

ICWD's letter to LADWP also addressed concerns about the Type E Transfer projects. LADWP's announcement of recent project monitoring and findings of goal attainment, and an intent to cease irrigation without County input was a surprise. ICWD believed irrigation cessation was years away and expected LADWP to provide notice and seek their input. The Water Department noted barren areas that had not been surveyed and the presence of plant species installed by DWP that are absent on adjacent lands and not in the 1999 Plan's Recommended Species List. ICWD also questioned whether recently fertilized and shallow-rooted plants left without water for two years would endure. Even if these plants endured due to precipitation, recent plantings might survive for two years but ultimately perish. To mitigate these concerns, ICWD suggested that irrigation should be provided for a minimum of at least one additional growing season in which precipitation is normal, or below normal. ICWD also pointed out that LADWP's planting of large patches of monotypic vegetation contradicted diversity goals crucial for the project success.

In light of these concerns, ICWD will continue to closely monitor the revegetation projects and report any changes in conditions.

Figure 5. Laws Type E Transfer. Laws parcels 94 and 95 as an example of drip line irrigated revegetation (June 30, 2021)