Type D: Riparian Vegetation Monitoring 2020-2022

Meredith Jabis
Inyo County Water Department

Riparian areas & vegetation

- Vegetation communities or habitats present along a river or stream bank hydrologically supported by the shallow groundwater table
- Transition between aquatic and upland zones

In our system, trees are a part of the riparian community – riparian woodland

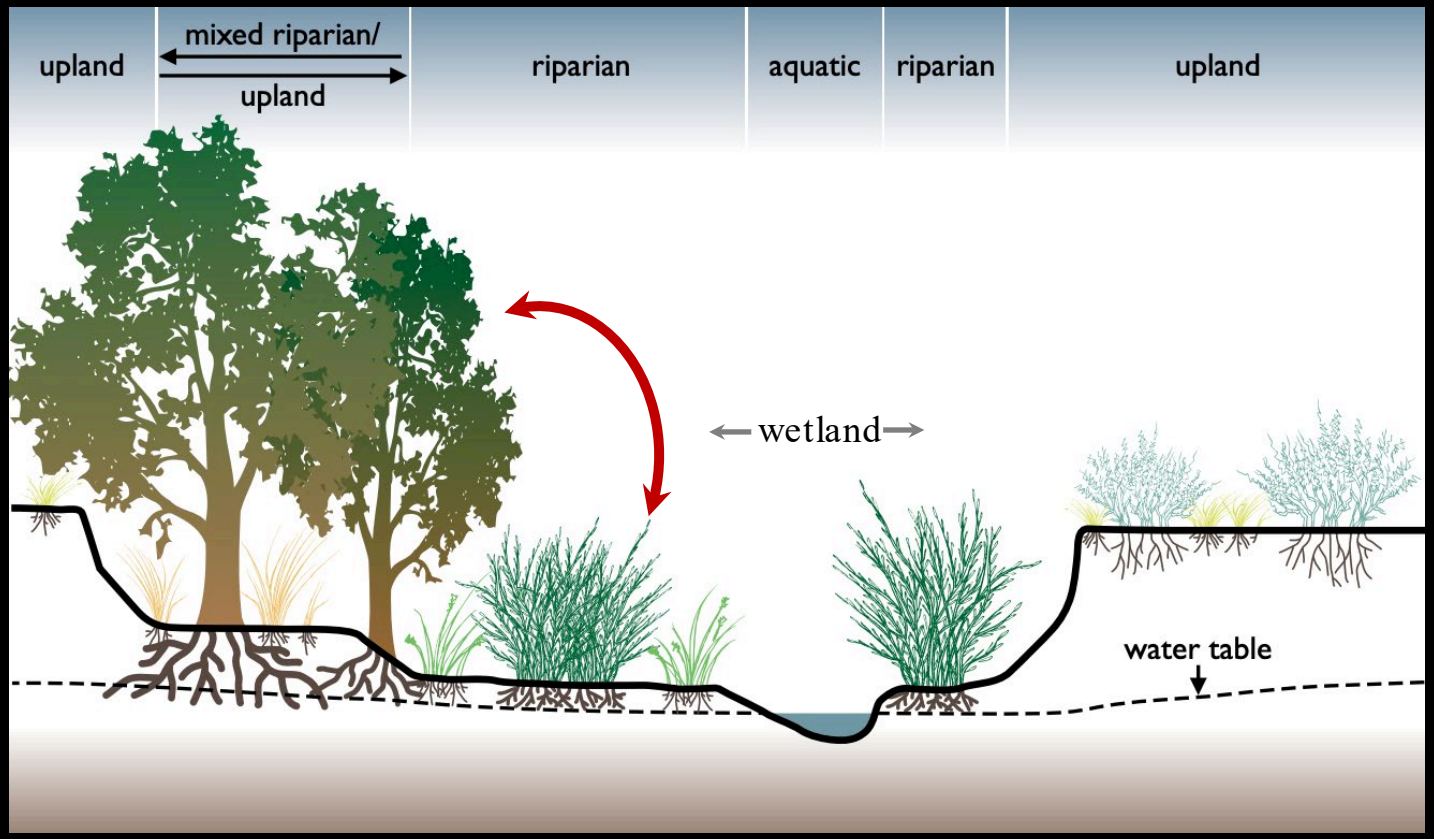


Image source: Dickard, et al 2015. Proper functioning condition assessment for lotic areas

Water Agreement:
Type D Vegetation

Green Book, Section 1.B.3

- "concentrated in areas of streams, swales, water conveyance canals, springs, and flowing wells…" that are "…more sensitive to water deficits…" than other vegetation types

Green Book, Section V.B.8

- "…a study will be initiated to refine the present methodology and investigate alternative methods to improve monitoring of riparian and marshland vegetation."

Rationale

Focus on riparian tree (woodland) community:

- Reduction in area on LORP
- Considered sensitive, CDFW
- Goal: establishment on LORP
- Many habitat indicator species riparian obligates

Recruitment theory

- Flood flows (stage rise)
- Mechanical disturbance
- Overtopping banks
- Recruitment occurs in ~10-5 year floodplain

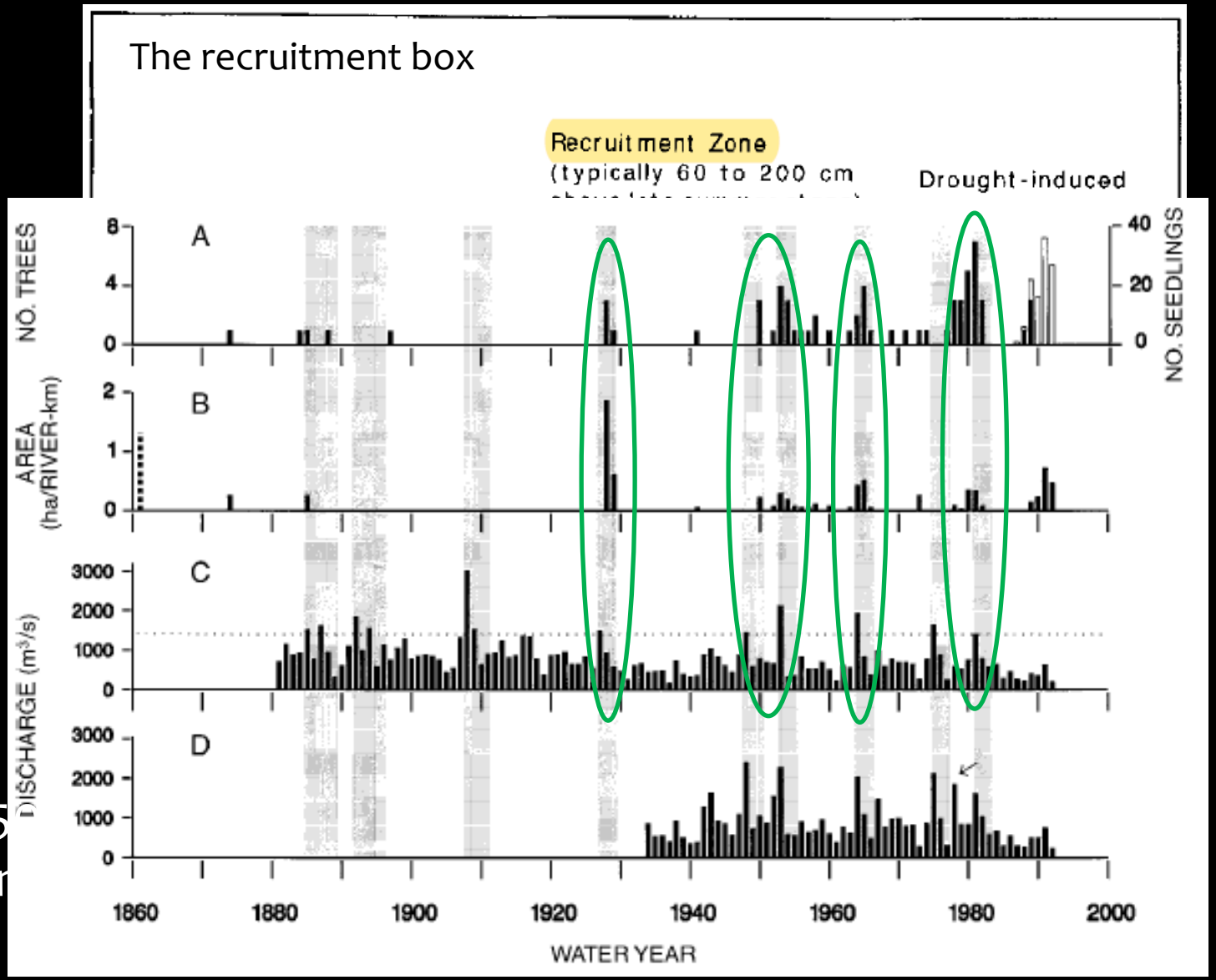
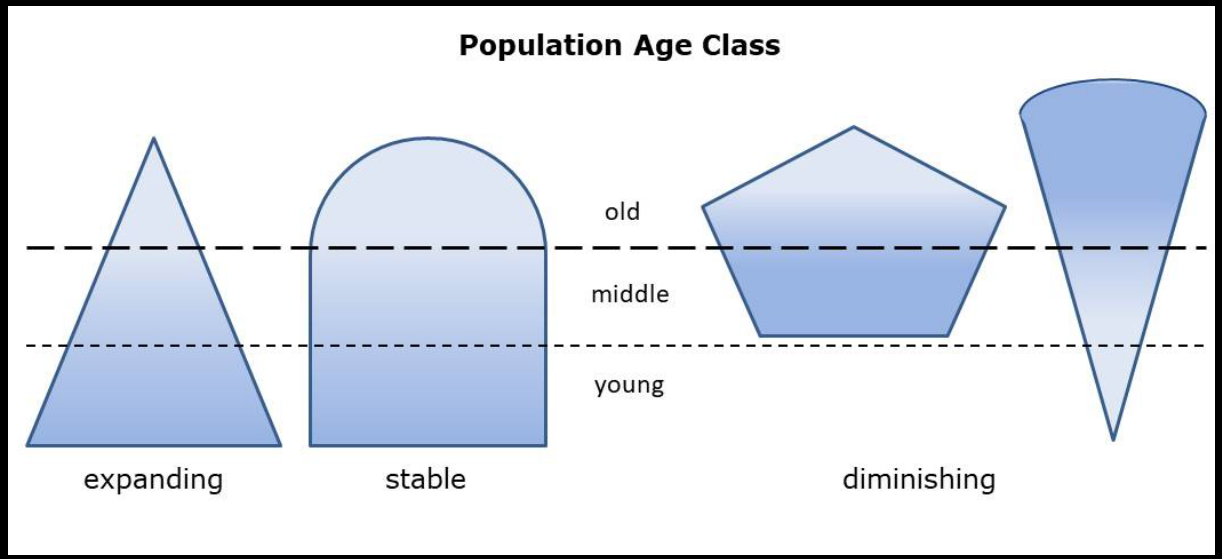


Image source: Scott et al 1997

Prior work

- Mapping efforts: quantify area and detect change in community type land cover
- Cannot determine why changes are occurring

- Requires information about stand density and age structure



Adapted from Dickard et al. (2015)

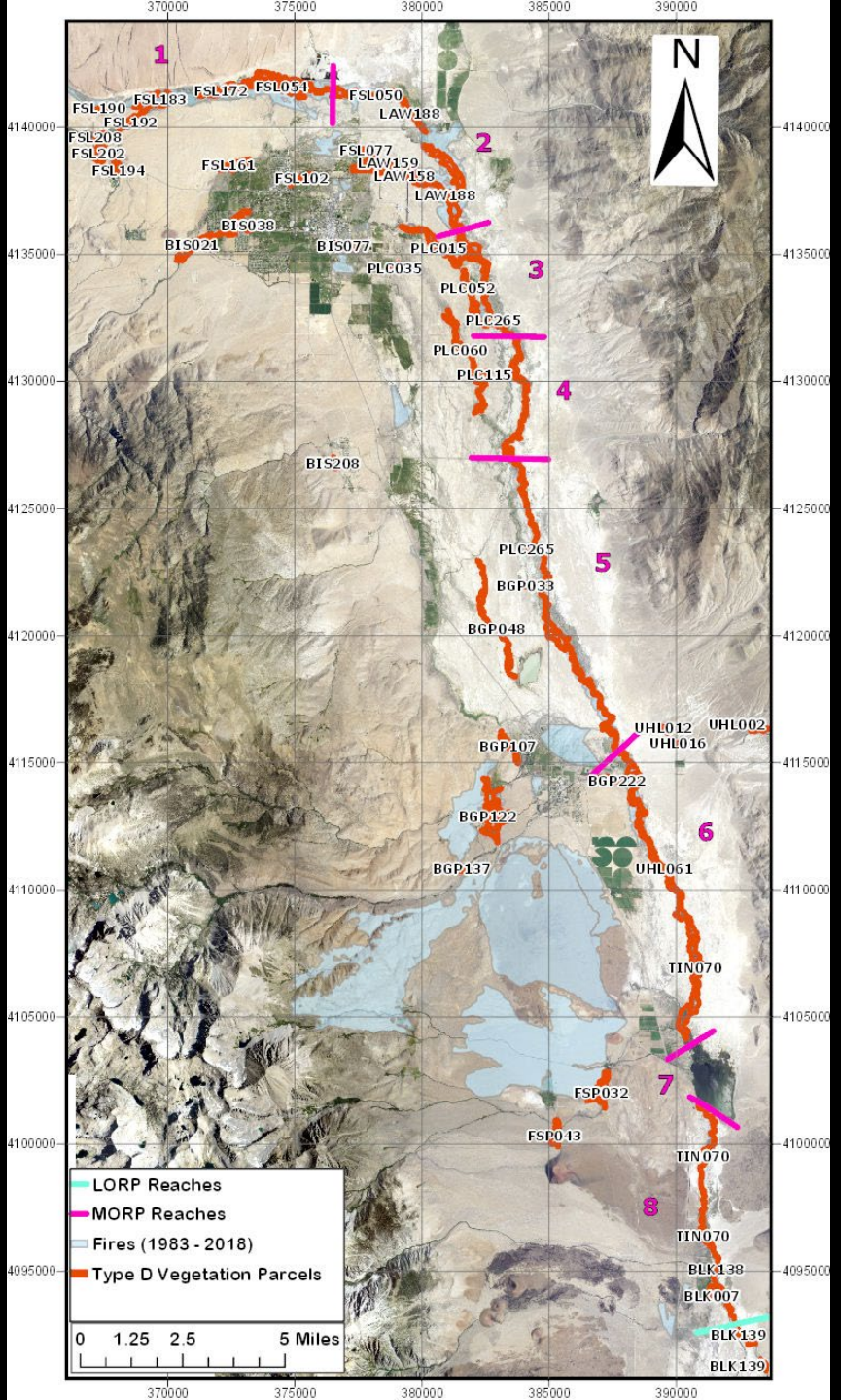
Questions

1. Historic conditions:
   supporting recruitment
2. Off channel meanders
3. Fire and recovery
4. Current age & stand structure

Methods

MORP Reaches

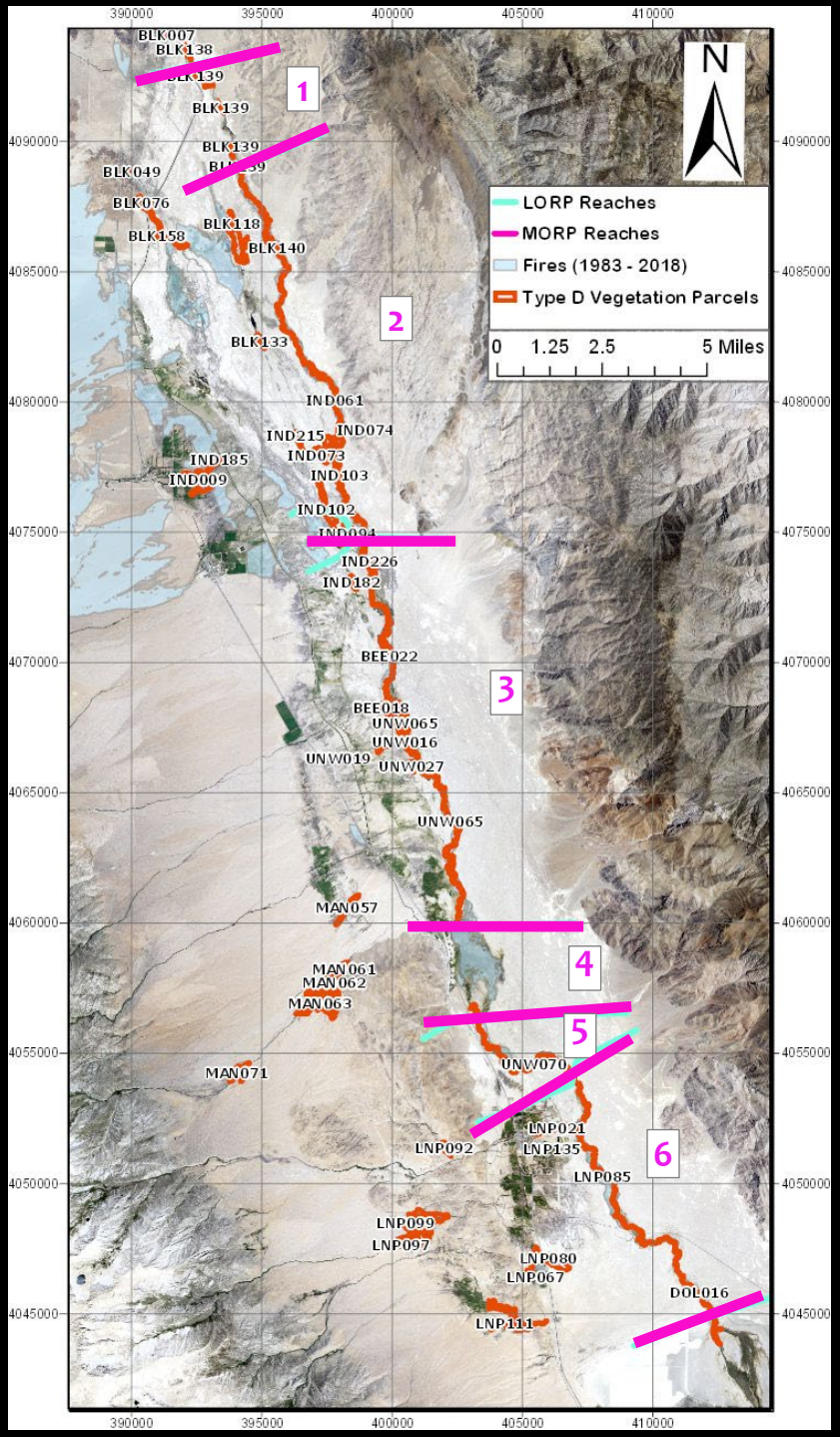
- from: Owens Valley Land Management Plan (2010)



Methods

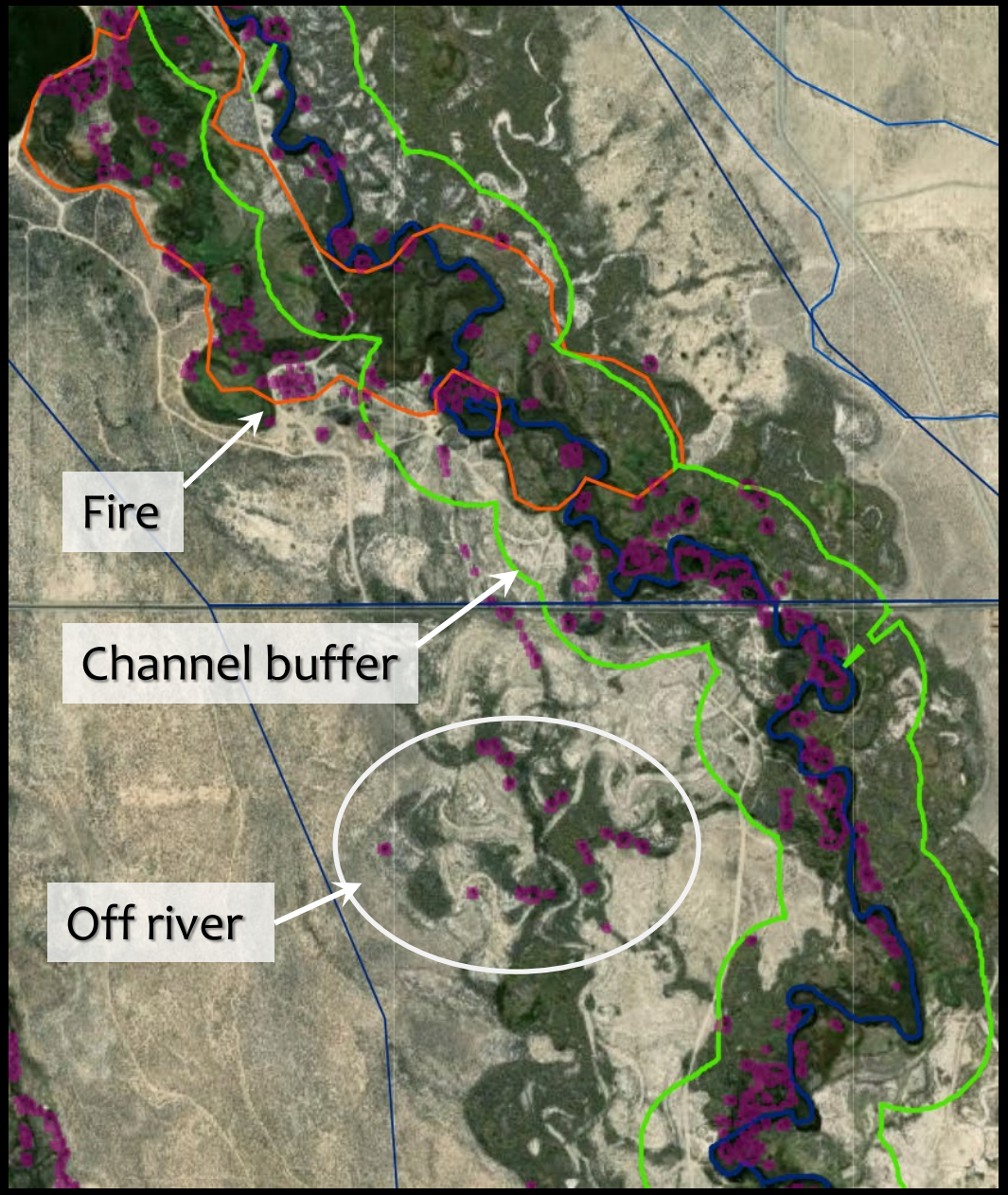
LORP Reaches

- from: Lower Owens River Riparian Vegetation Inventory 2000 Conditions (2004)



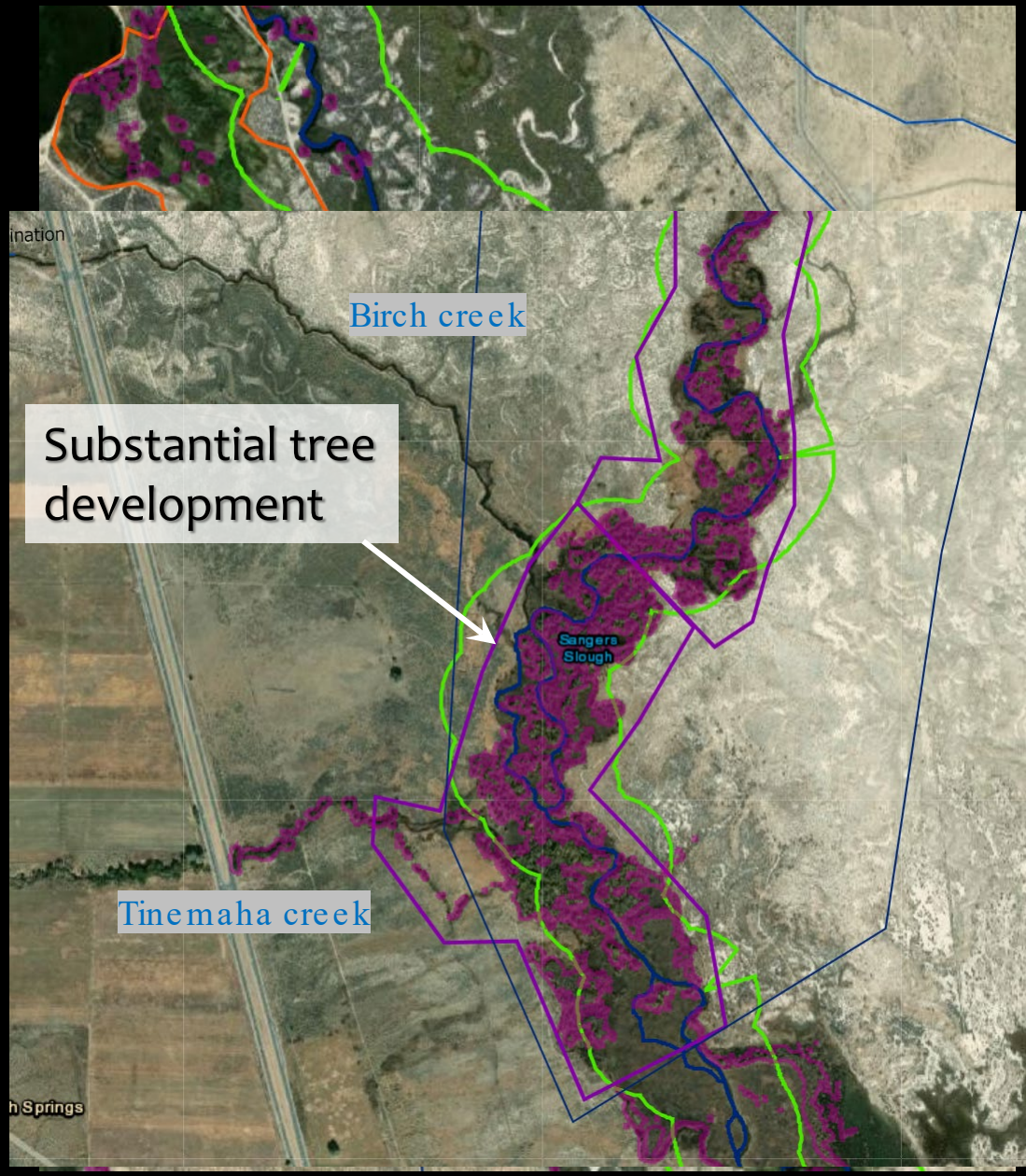
Methods: strata

- On/Off main river channel (150m buffer)
- Fire/no fire
  - MORP
    - 2002: 20 yrs post fire
  - LORP
    - 2013: 9 yrs post fire



Methods: strata

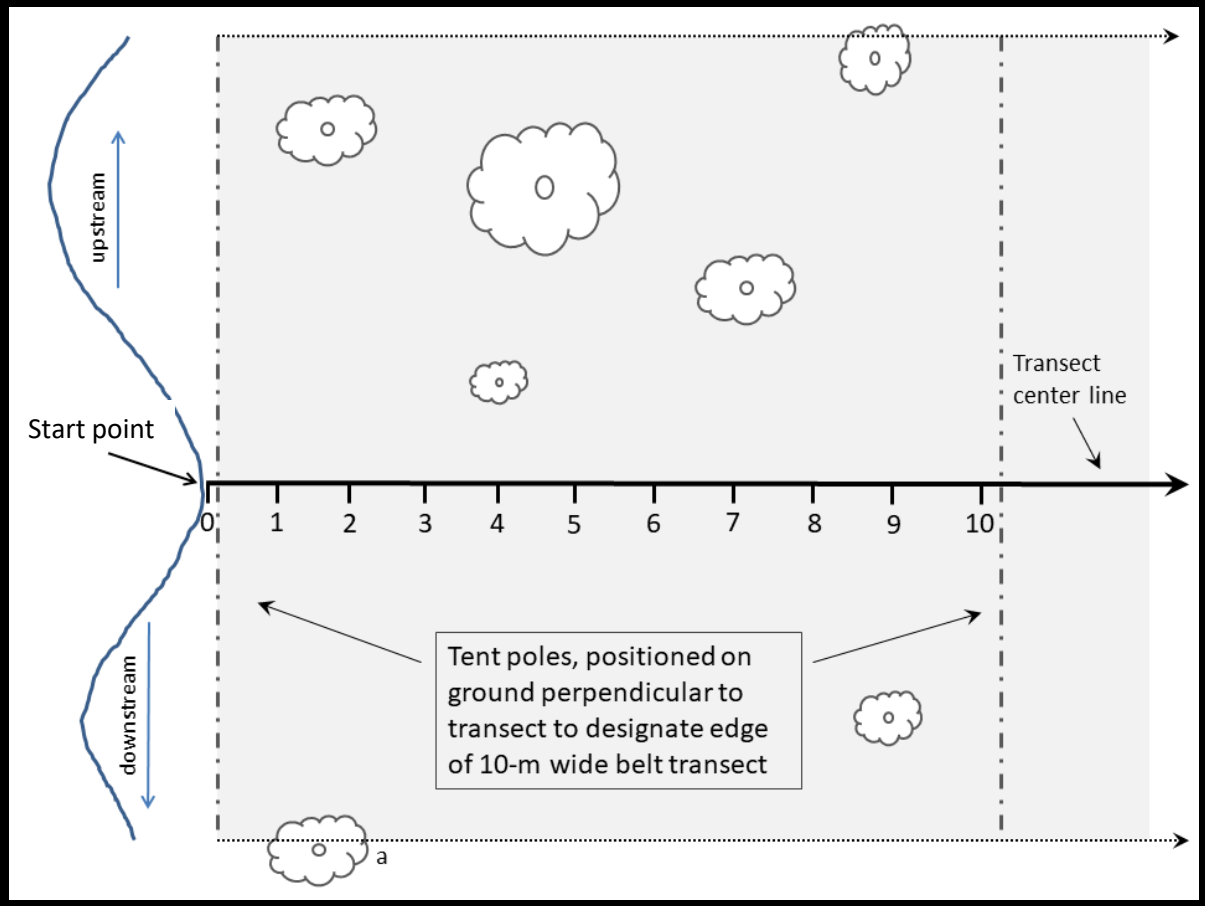
- On/Off main river channel (150m buffer)
- Fire/no fire
  - MORP pre- 2002
  - LORP 2013 on LORP
- Supplemental hydrologic input zones/ reservoir Backwaters
  - primarily MORP R6 (& MORP R8)



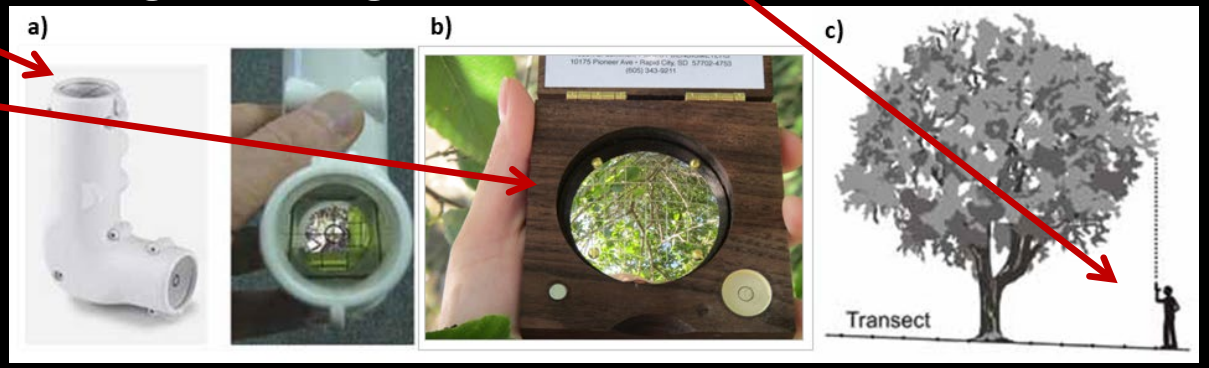
Type D Riparian Transects

- perpendicular to channel & span the width of floodplain ~ extent of tree canopy

Methods:
transects



- Transect perpendicular to channel & width of riparian corridor
- Centerline: 3-tier line-point vegetation ground & canopy cover, canopy closure

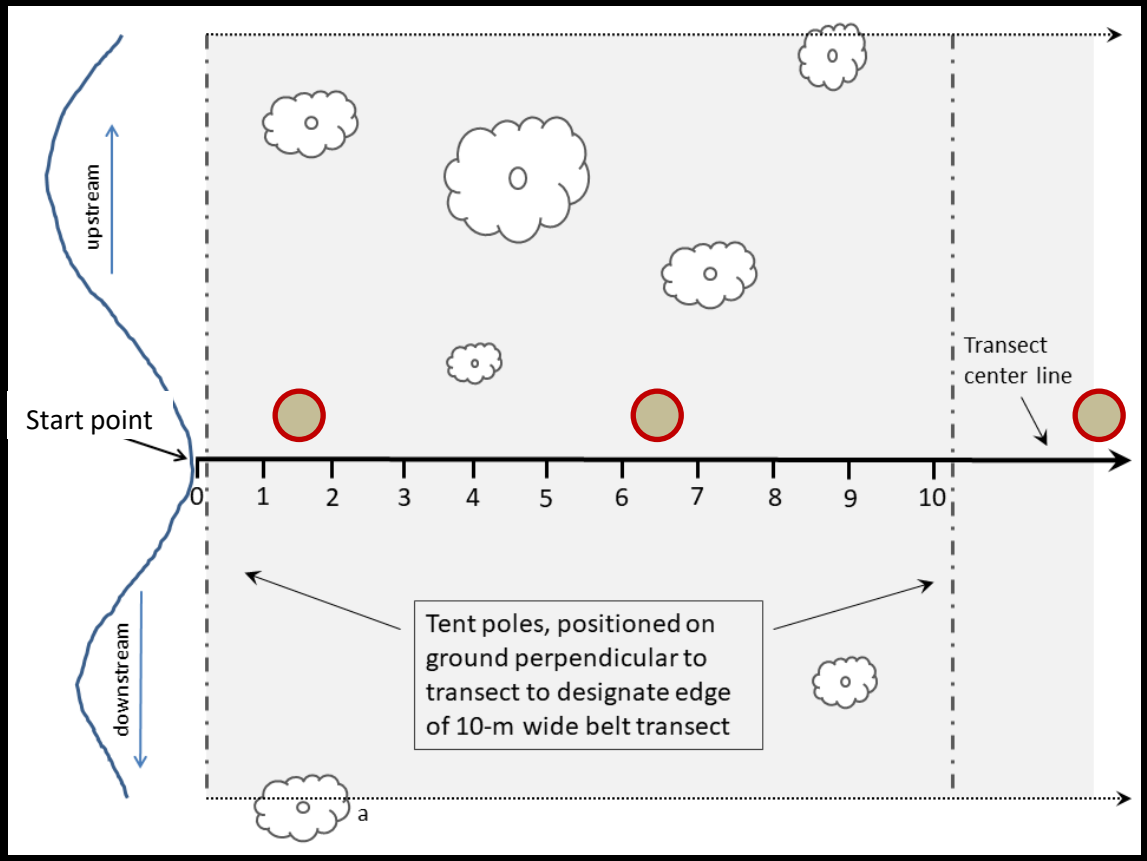


Methods:
transects

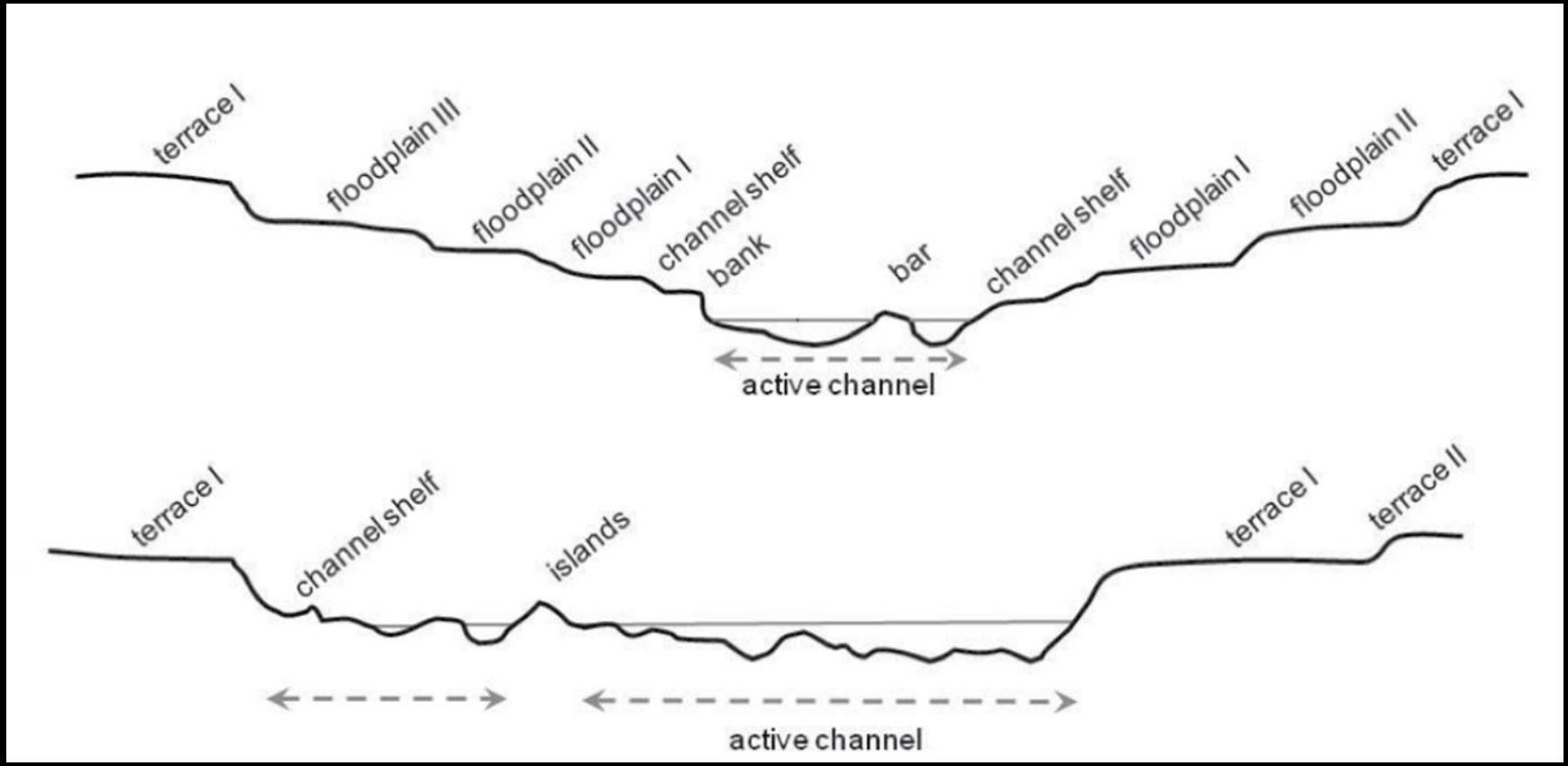
- Belt transect: 10 m wide, all trees
  dbh, height, potential canopy, so
- Tree elevation above stage
  (multiple stage levels relative to bank will be recorded, at a range of flows)

Soils

- Collected at each change in soil type along centerline
- To determine if soil type affects recruitment



Fluvial surface



- Collected along transect centerline
- Types:

  Channel, point bar, bank, floodplain (4 levels), floodplain-depression, floodplain-old channel meander, terrace (3 levels), spreading basin

Sampling to date & goals

Proposed: draft plan

Portion	Reach	Length (km)	(mi)	Transects
MORP	1	23.6	14.7	20
	2	14.1	8.8	30
	3	7.6	4.7	30
	4	6.9	4.3	30
	5	18.5	11.5	60
	6	17.2	10.7	60
	8	11	6.8	40
LORP	2	25.3	15.7	20
	3	24	14.9	30
	5	6.9	4.3	20
	6	16.9	10.5	30
TOTAL				370

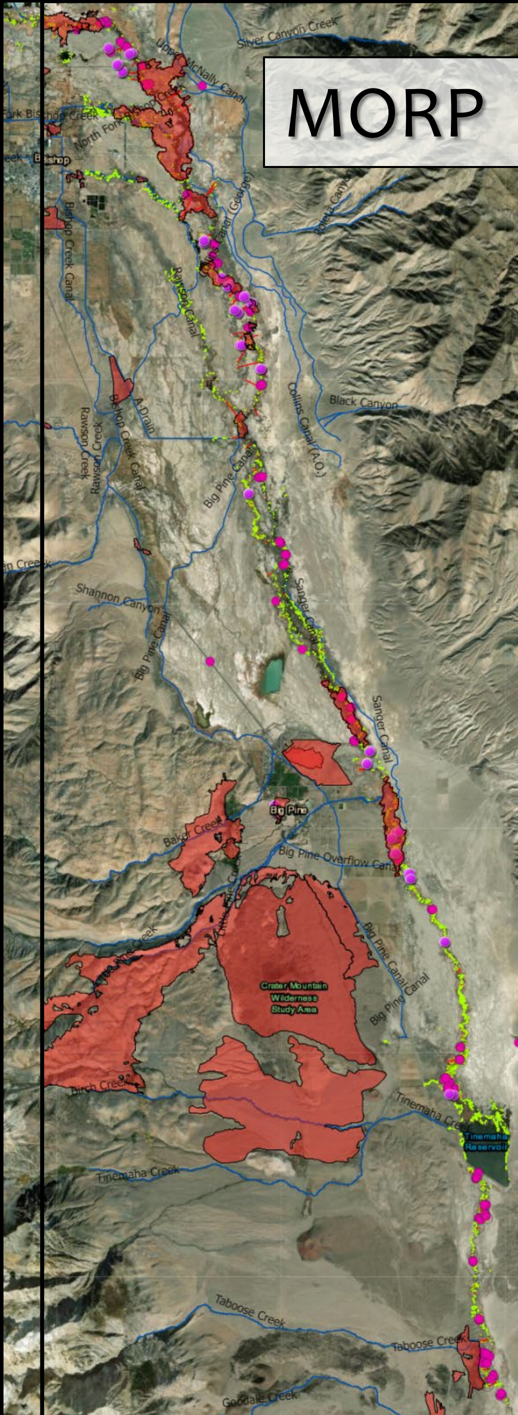
New goals

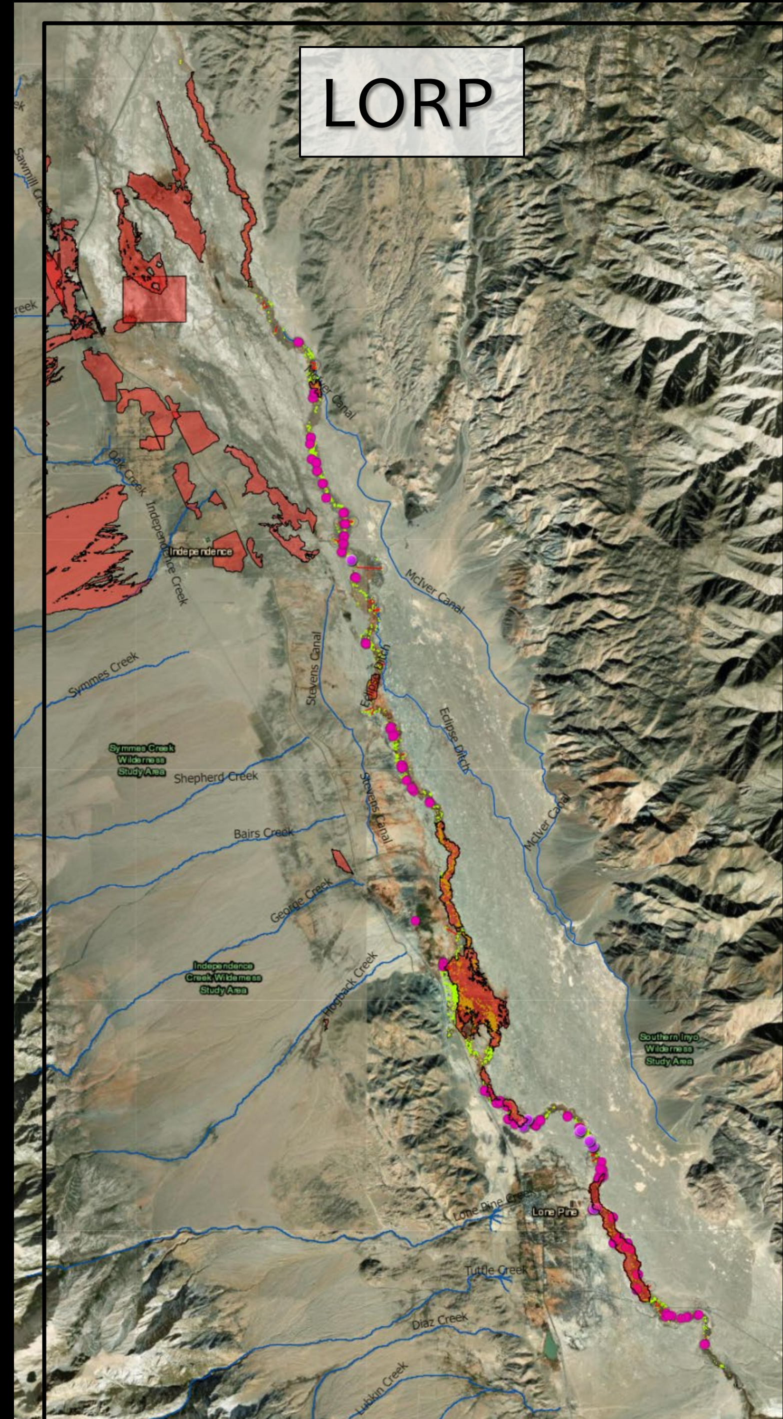
Portion	Reach	Transects
MORP	1	na
	2	25
	3	12
	4	9
	5	12
	6	25
	8	15
LORP	2	15
	3	25
	5	10
	6	25
TOTAL		173

Airport fire

~ 15-25 transects per reach depending on strata

- 128 transects complete
- 45 transects needed in 2024


MORP
Silver Canyon Creek
McNally Canal
Bishop
Bishop Creek Canal
Rawson Canal
A-Drain
Black Canyon
Collins Canal
Big Pine Canal
Shannon Canyon
Sanger Canal
Big Pine
Baker Creek
Big Pine Overflow Canal
Crater Mountain Wilderness Study Area
Birch Creek
Tinemaha Creek
Tinemaha Reservoir
Taboose Creek
Goodale Creek


LORP
McIver Canal
Oak Creek
Independence
Independence Creek
Symmes Creek
Stevens Canal
Eclipse Ditch
Symmes Creek Wilderness Study Area
Shepherd Creek
Bairs Creek
George Creek
Hogback Creek
Independence Creek Wilderness Study Area
Southern Inyo Wilderness Study Area
Lone Pine Creek
Lone Pine
Tuttle Creek
Diaz Creek
Lubkin Creek

Work ongoing

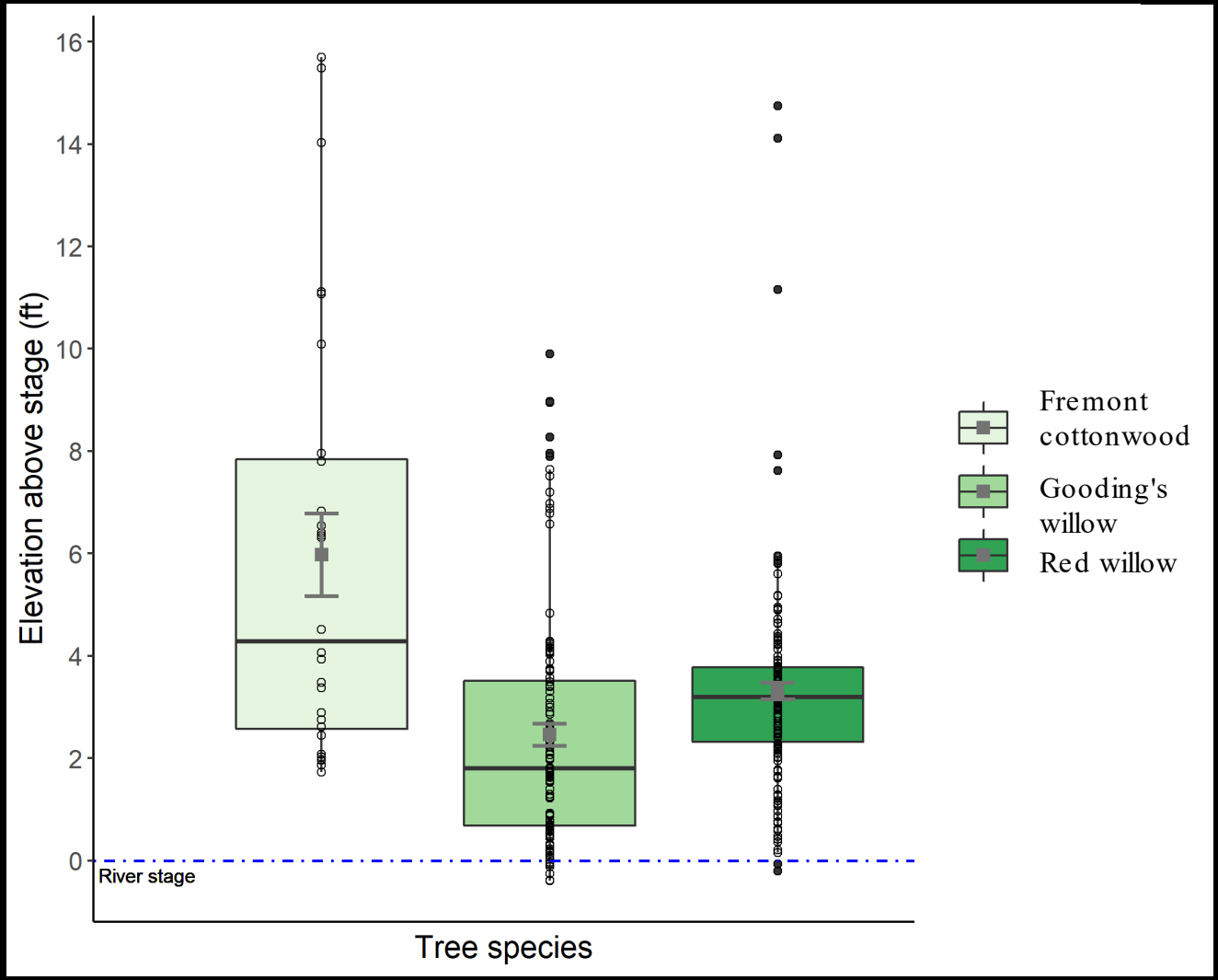
- Results incomplete
- 128 transects complete to date
- Need 45 more transects

Preliminary results:
Tree elevation above stage

Fremont cottonwood
(*Populus fremontii*)

Red willow
(*Salix laevigata*)

Goodding's willow
(*Salix gooddingii*)



Tree cores

Photo source: https://www.visualisingdata.com/2015/02/dendrochronology-visualisation-literacy/

- Need to collect ~200 cores (of 600) in summer 2024
- Rocky Mountain Tree Ring Research – to process samples in November
- Once cores aged –> correlate with river flows in likely establishment year

Questions?