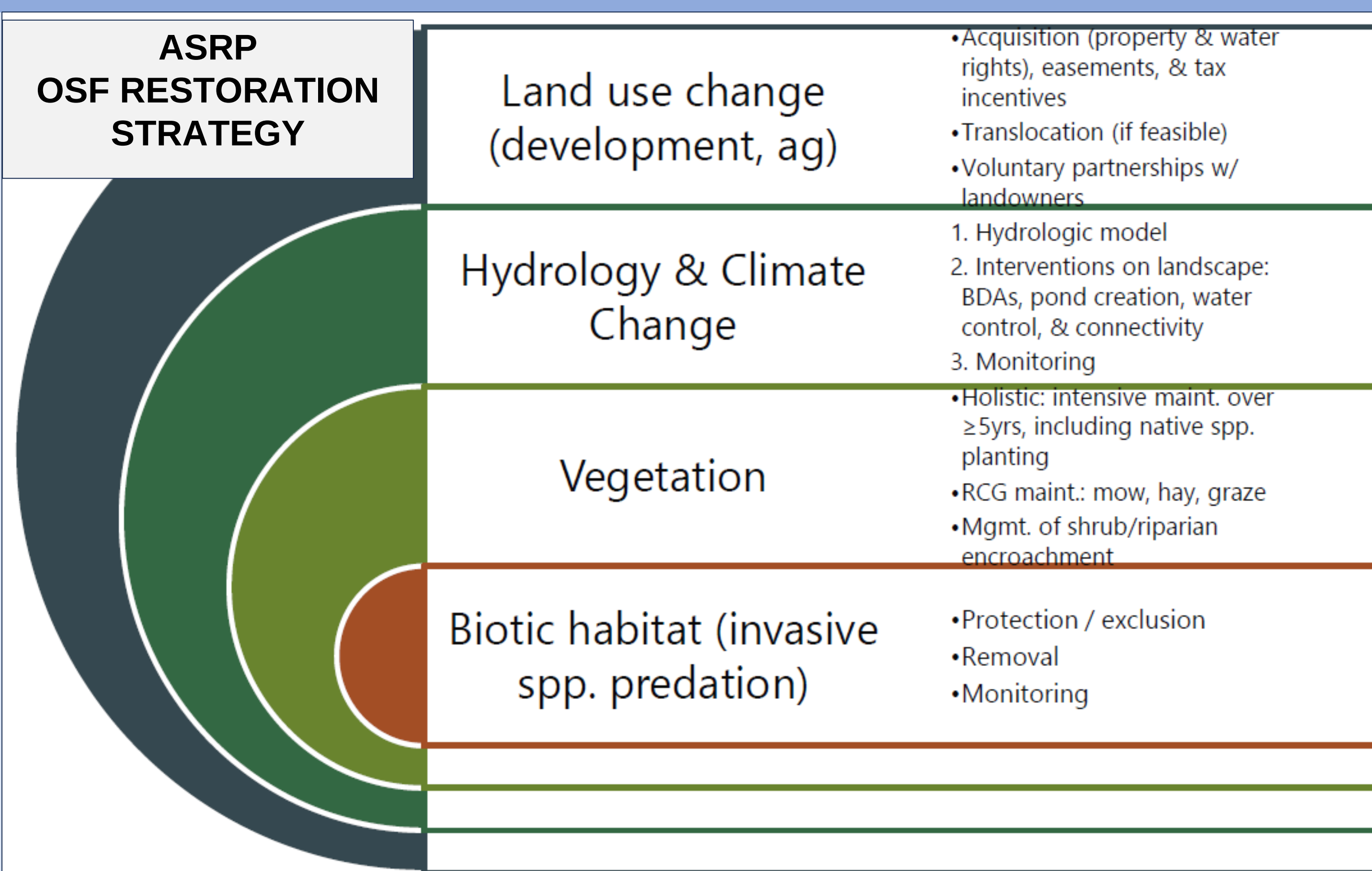
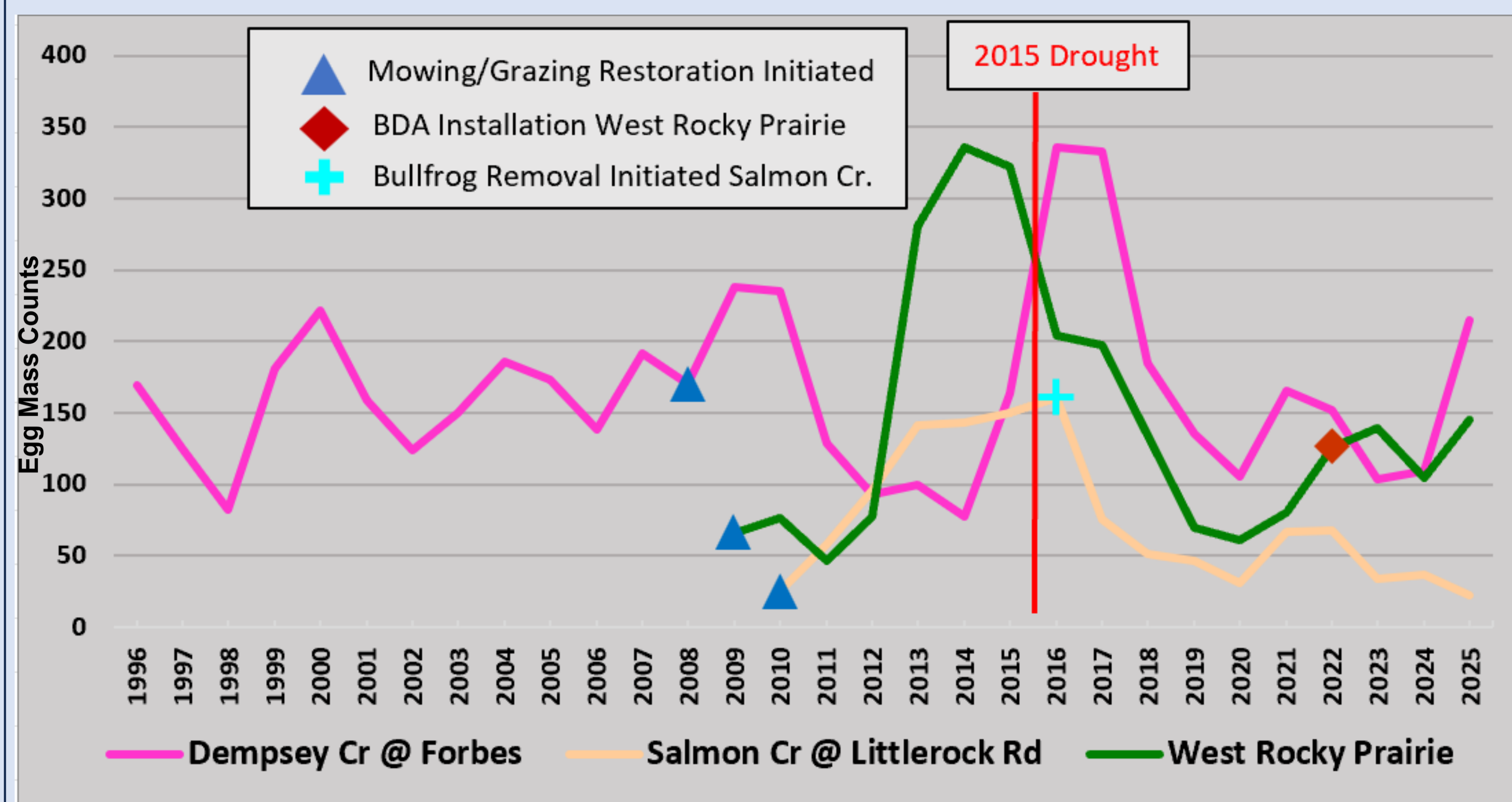




STATUS & TRENDS

- Consistent **S & T monitoring** is essential for understanding and managing OSF
 - Yearly egg mass surveys at 3 sites with long term data & 2 restoration sites
 - Every three years all known OSF sites are surveyed by partners
 - Expanded survey effort have resulted in several new sites since 2013



- Determining background rates of population changes (like interannual variation) and the influence of restoration actions and environmental change is critical
- High degree of synchrony in population fluctuations across sub-basins could suggest a strong shared response to climatic conditions

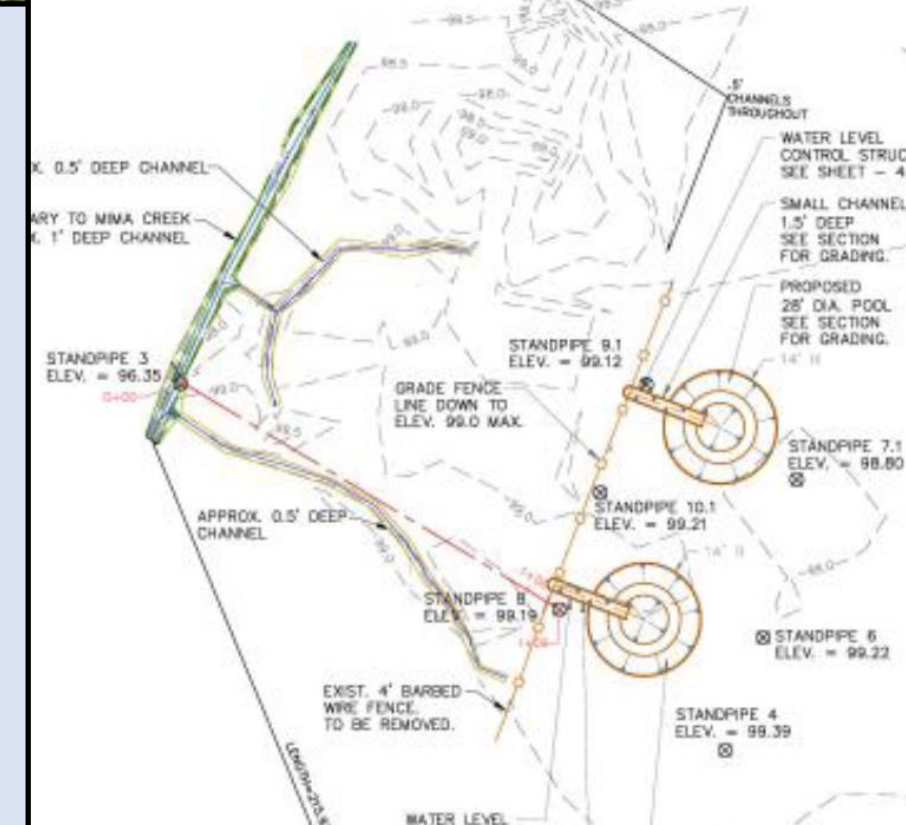
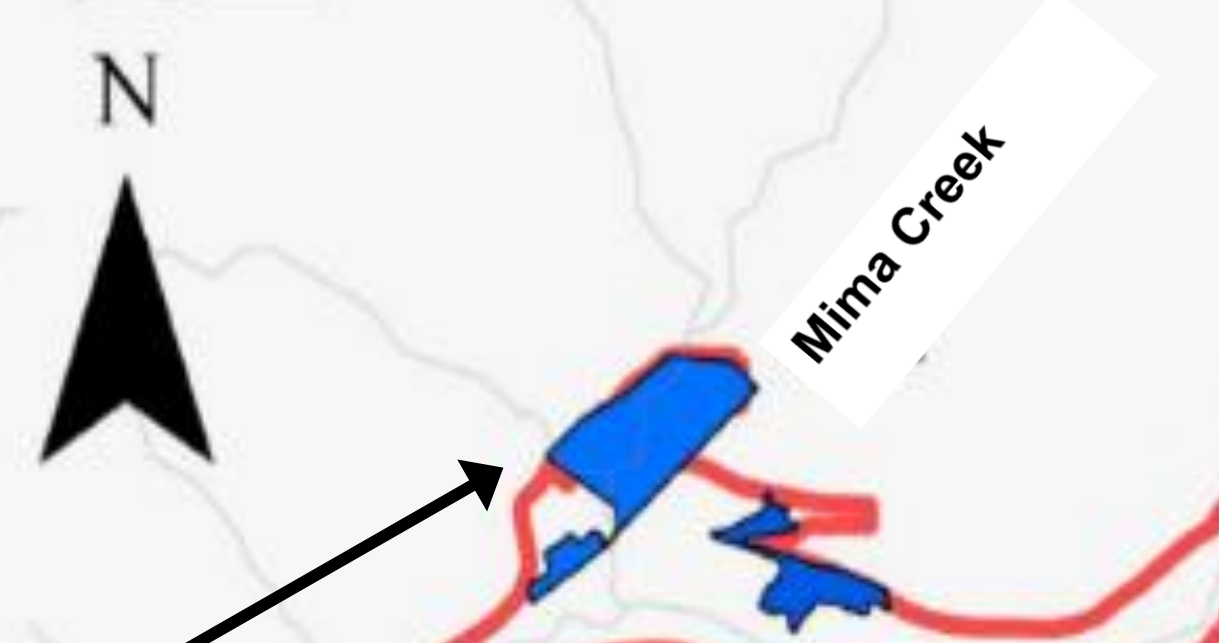
Mima Creek Unit

- Restoration:** RCG control (mowing and haying), RCG herbicide experiment, wetland/pond creation & water control structures on adjacent creeks (pending)
- Monitoring:** Hydrology, egg mass surveys, egg/tadpole development, auditory for bullfrogs
- Key learnings so far:**
 - Hydrology needs to be maintained throughout year
 - Breeding habitat needs to be maintained in short stature
 - Piezometers suggest groundwater availability across all seasons could sufficiently recharge constructed ponds
 - Genomics highlight low diversity which might benefit from augmentation



Upper Chehalis Black River OSF Populations through 2021 - USFWS

- Hopkins Ditch
- Fish Pond Ck @ 54th
- Fish Pond Ck @ 66th
- Michelle Creek
- Dempsey Creek
- Salmon Creek @ Littlerock Road
- Salmon Creek @ Case Road
- Black River Floodplain @ 110th SW
- Black River Floodplain @ 123rd SW
- Allen Creek – Aldrich Road
- Blooms Preserve
- West Rocky Prairie @ Beaver Creek
- Mima Creek 1
- Mima Creek 2
- Oregon Spotted frog Critical Habitat

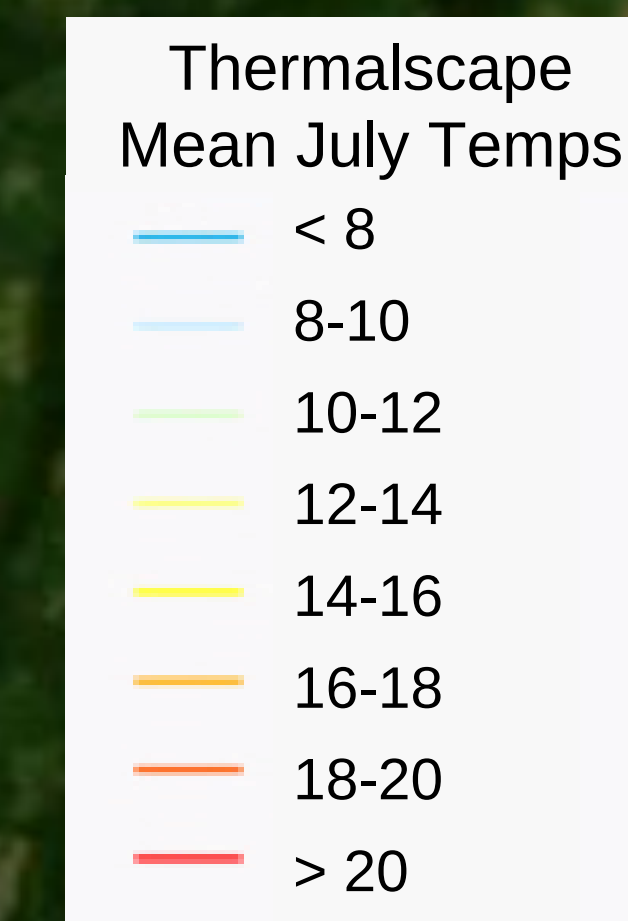


West Rocky Prairie Unit

- Restoration:** RCG & Willow control (mowing/cutting), emergency BDA installed, RCG herbicide experiment, pending hydrology model to inform restoration actions
- Monitoring:** Long-term Hydrology, seasonal habitat usage, egg/tadpole development, auditory for bullfrogs, S&T egg mass surveys
- Key learnings so far:**
 - Breeding habitat needs to be maintained in short stature
 - Summer water deficit across unit since 2015 drought
 - Pit tag arrays identify habitat usage by season, sex and age class to ID high priority restoration habitats
 - Home range:500 ft to >1500 ft, via water, highlights varied habitat needs
 - Adults can breed for 6+ years, highlights importance of each frog for population growth and genetics



Increasing river temps by 2080, will make the lower Black River more invasive predator friendly for species like Smallmouth Bass and Bullfrogs



- Freshwater Mussels**
- floaters
 - Western Pearlshell
 - Western Ridged Mussel

- Olympic Mudminnow
- Smallmouth Bass Current Habitat
- Smallmouth Bass Future Habitat (2080)

Blooms Preserve

- Restoration:** Wetland/ pond creation (24 ponds), RCG control (mowing), native emergent plantings, future willow removal from oviposition habitat
- Monitoring:** Hydrology, vegetation, temperature, DO, egg mass surveys
- Key learnings so far:**
 - Constructed areas create oviposition habitat, but perform inconsistently year to year, especially when compared to a nearby natural wetland
 - Flashy hydrology may require eggs to be moved
 - Continued mowing is necessary to maintain good oviposition habitat.
 - Water remains in the ponds all year creating important summer refuge
 - Future climate change modeling could be useful
 - Exotic bullfrogs and nutria have moved in

