

Food Web Meeting  
Nov. 24, 2014  
DWR – West Sacramento Office, Room MRBS

Participants

CDFW - Rosemary Hartman, Stacy Sherman, Trishelle Morris, Dave Contreras  
USGS - Jan Thompson, Larry Brown  
UC Davis - Jim Hobbs  
DWR - Tiffany Brown, Betsy Wells, Heather Fuller  
SFCWA – Kelsey Cowin  
Bruce Herbold

Hypotheses and Metrics Discussion

- Incorporating sampling design into our restoration sites would be great
- Hypothesis 2.2.2 – For stable isotopes it is going to be messy and hard to find a clear signal
  - Genetics on zooplankton diets may be better link than stable isotopes, but be very expensive
- Should untestable hypotheses be removed from the general plan?
  - Methods should still be recommended, as new techniques are always being developed
- Hypothesis 5.1.2 – The Boyer lab at SF State is working on eelgrass and we should contact them for methods on epiphytic algae (which is hard to measure). Based on the decision tree idea, may only want to look at epiphytic algae if phytoplankton and zooplankton don't answer any questions.
  - Robin Steward at USGS has looked at epiphytes with an emphasis on mercury detection.
  - Method For 5.1.2 - Laying out plastic plants may be a way to measure epiphytes. However, we do not know how this data would compare with epiphytes on real plant structures
  - Emergent Vegetation extraction and preservation
  - Europeans have done this work and may have monitoring methods worked out
  - Smithsonian Environmental Research Center at Tiburon have done a lot of this work with settling plates
  - 5.1.2 Need methods for harmful algal blooms
    - Perhaps microcystis can show up on an aerial photo (Susan Ustin?)
- Crayfish and shrimp need to be added to hypothesis 5.1.3
- 5.1.3.1 method – artificial plant structure (should read about this), Harvest plant structures and put in formalin talk to Goldman or Sharon Lawler about this
- 5.1.3.3 hypothesis should state whether it will increase or decrease benthic production
- Hypothesis 5.1.3.3 Epibenthic Algae Methods
  - Do Chlorophyll cores
  - All epibenthic will need to be identified
  - Filter via paper left in situ for diatoms to migrate up on
- 5.1.3.3 – Benthic invertebrates methods need to be added

- Benthic core sampling
    - Divers identification in vegetated areas (ponar grabs do not work)
  - How important is benthic sampling in vegetated habitat? It is very difficult to do.
    - Biggest corbicula were found between Egeria and tules so it could be important. Polychaetes may also be important.
- May need to address identification frequency to see if new aquatic or veg invaders have come
  - This may be addressed by field crew routinely sampling and reporting anything new
  - It would help to have a “watch list” of potential invaders for crews to look out for
  - We will refine frequency of sampling when we have our methods chosen
- 5.2.3 fish stomach fullness will need to be sampled frequently to be useful on a population level, may not be feasible
- Premise 5.3 is brought back in as there is no mention of microcystis listed as a metric in diet
  - Hypothesis 5.3.1: Fish food quality, and quantity will be reduced.
    - Metrics – Presence of HAB, Toxicity in zooplankton
      - Methods – Ask contaminants team
  - Hypothesis 5.3.2: Harmful algal blooms may reduce fish feeding, reproductive, and/or growth rates.
    - Punted to the fish team
- Hypothesis 6.1 Methods
  - Add benthic cores
    - Find who uses ponar grabs (DWR’s benthic sampling) and try to use their same methods
- Hypothesis 6.2 Metric
  - Add turbidity to water depth and residence time
- Hypothesis 8.1.1 - Add benthic/epibenthic invertebrates to incorporate invasive clams
  - Metric – Add breach size/design since it increases predator ambush at these locations
- Hypothesis 8.2.1
  - Metric – abundance/density of non-native species
  - Need to separate predation from competition to each be their own hypothesis, since predation is more easily testable and defensible. Competition will be harder to test and prove
- Bird predation is currently not a concern for predation, but may be as soon as more wetlands are restored
  - This may be a special study
  - Need to find long term monitoring programs for birds
  - Susan De La Cruz USGS bird program.
  - Bruce will provide Rosemary a name for a bird monitoring program occurring at Point Blue (formerly Point Reyes Bird Observatory)
- Otters don’t seem to be a big source of predation for smelt and salmon, but may eat a lot of crayfish

- Salmon may be in the otter habitat when other fish are not abundant and may be eaten
- Frequency - This may be a special study, mostly important if they are keeping the crayfish population down

### **Frequency**

- Hypothesis 6.1 – Early Spring and Fall (May and October). Clams won't have an effect on Salmon and may only have an effect on resident smelt. This timing would tell you if they're affecting the spring and fall bloom.
  - Benthic invertebrates sampling ideally should occur monthly – but the data may still be highly variable.
    - Power analysis will tell you sample a lot more, but programs are constrained by budget.
  - Location – See where the fish are most aggregated and benthic sample there (ie if there in the shallows and not in the deep, then sample the shallows)
- Benthic samples are expensive (timely) to process in the lab and identification may need to be scaled back if we just want to learn about processes in the system.
- Lab ID time will be an issue for most of these samples. We will investigate methods to get at biomass/processes rather than taxonomy.

### **Next Steps**

- At the next PWT, try to talk about whether it's ok to scale back lab identification as we just want to learn about the system processes and whether we should sample using artificial structures (ie settling plates can be put in and replicated at different locations).