

PNW Native Freshwater Mussel Workgroup  
Quarterly Meeting  
Friday, October 29, 2021 Pacific Time  
Zoom Meeting

Agenda and Minutes:

- updates from Idaho (Ryan Blackadar, Dorene MacCoy, Joel Sauder)
  - Ryan (USFWS IFWO): Bruneau River mussel mania in September (4 agencies, 13 people), western ridged mussels, found and PIT tagged 62, plus 1 western pearlshell, 40 collected haphazardly and opportunistic, 22 in quadrats and transects to get density estimates (0.37/m<sup>2</sup>), measured (29-76mm sizes), future work to do a long-term study in the area, plan to continue tagging mussels
    - also work on Sawtooth NF and NRA- surveys for mussels, also worked with IDFG to analyze archive eDNA samples on Salmon River for a research trip, intend to continue collaboration in 2022, including eDNA (plus Idaho Power and City of Boise). Hoping to collaborate with Shoshone Bannock and Idaho State University
    - did not make it to Weiser River this year, so high on list to revisit
    - Joel Sauder, IDFG: eDNA samples from RMRS and collected for other purposes to be sampled for mussels, expanding across ID for next round
  - Joel (IDFG): Rafted mainstem Salmon River (Corn Creek to Carey Creek boat ramp ~80miles of river) with Dave Stagliano and others, September 2021 (before water temps started to drop, ~15-17 C water temp)
    - Building more capacity to work on western ridged mussel in 2022 and 2023.
    - Spot checks, bucket transects, Snorkel & Dive (mini dive 10 minutes of air), length measurements (50mm to 90mm; most common 71-75mm), 1/4m quadrats (no randomization, variety of habitats)
    - Wanted to confirm presence throughout the float (sampled every 2-3 miles)
    - Observations of occupied/non-occupied habitat
    - 100% cobble and 100% sand habitats were poor & marginal habitat (contrasted prior literature observations)
    - Most dense beds were observed out of the main current; fines in the interstitial spaces. Overall could find mussel with little effort. Reliably find mussels every couple miles over 80-mile stretch. Increasing mussel presence as moving down stream. Not many empty shells/no die offs anywhere.
    - Measured ~ 1400 mussels. Seems like a good age/size spread. Not many smaller than 50mm.
    - 22 quadrats buried were 20-50% of surface count. No difference surface:buried mussel length
    - 5-40% sand; stabilized by cobble or boulders (angular block rock better); pockets behind large boulders; lower water velocities where depositional material can settle; inside bend of a channel
    - SF Salmon River has abundant Western Pearlshell
    - 2022 & 2023 plans to repurpose eDNA data when possible all over Idaho to better assess distribution
    - Elizabeth Torrey: Clear bottomed raft and Kayaks? Would those help with ID or observations. JS: long-term issues with scratches. With a little experience ID is not problematic. Western pearlshell extend out of substrate while western

- ridged mussel is buried to valve. Bucket viewer seems easier than clear bottom rafts. PR-49 “pack raft” has no water draw and very maneuverable
  - Dorene MacCoy (City of Boise – WQ division): Sampling and monitoring team, monitors Boise River
    - Search for mussels in the lower Boise River. Southwestern ID. Urbanized/suburban ID. River diverted upstream at Lucky Peak Dam to irrigate agriculture and returned to river downstream. Boise interested in freshwater mussels: Lander St and West Boise Water Renewal Facilities. Ammonia in EPA Clean Water standards updated in 2013. Decided to look for freshwater mussels in 2018 Boise River seems like amazing habitat.
    - Figure 2013 EPA guidance (in waters >15C, early life stages of mussels)
    - 2019 worked with FWS-Dave Hopper in trout spawning reaches to look at detectability with eDNA at Loggers and Landers Creek.
    - Visual and eDNA surveys
    - Smithroot eDNA (3 sampling / efisher backpack style)
    - Aging mussels (sent shells to Wisconsin lab)
    - Chris Caudill (U of Idaho) – D. Nemeth sent shells and a grad student will be doing their thesis on aging?
    - Fish Host evaluation (College of Idaho, potential host fish, vouchered 5 of each species (e.g., rainbow, brown, mountain whitefish, sculpin, dace to look at gills/fins)
    - Flow model (Lidar; 2D model) overlaying with habitat suitability curves for fish and mussel
    - USGS building an eDNA lab in Boise, not sure when it will be accepting submissions. (See another mention below.)
- updates from Utah (Kate Holcomb)
  - eDNA Torrey Rodgers / Karin Mock (western pearlshell; floaters): generalization not a lot of density. Few mussel = low detection of freshwater mussels at a short distance from source individuals.
  - Eric Wagner (UDWR) guide “Utah mollusk identification guide” available spring 2022
  - New locations for western pearlshell! Beaver Creek, Summit County, UT. Just found new populations in Goose Creek (western pearlshell and floaters) and Mill Creek (Upper Bear).
- update from Yakima Basin, WA (Craig Haskell)
  - Yakama Nation has done the past work (WDFW – Elizabeth Torrey, U of Idaho)
  - 2021 preliminary data from repurposing eDNA (lamprey samples ~65 samples)
  - Developed proposal for entire basin for eDNA (shopping the proposal around)
  - October 2021 – met with Yakima Nations at Sunnyside
  - John Erhardt (IFWO) showed tagging techniques
  - Annual dewatering salvaging lamprey, western pearlshell, western ridged mussel from side area to mainstem river
  - Next steps: Toppenish Creek NWR develop long term monitoring station
  - Expand eDNA sampling
  - Collaboration (Yakama nation; U of Idaho) develop broad long term monitoring plan
- eDNA planning and collaboration (Emilie Blevins, Courtney Newlon)
  - PNW workgroup members have long been involved in eDNA sampling efforts for mussels
  - increasing interest by agencies, tribes, and other organizations to collect eDNA samples

- many people get in touch with RMRS and eDNAAtlas to process these samples, but others do not, concern about duplicate efforts
- large library of samples at RMRS that could be rerun for mussels
- Courtney, Emilie, and staff at NGC and RMRS spoke about efforts to coordinate:
  - review where sampling has occurred
  - identify where sampling would be valuable
  - coordinate to share this with people who contact about sampling, and others
- opportunity to share your projects, select areas of interest to pursue sampling
- more information in early 2022
- Bruce mentioned metabarcoding project from PNW USFS and a new project that will include mussels. Also noted that samples online don't mean mussels aren't present
- Alexa-CTUIR is using the atlas to select sites for sampling (100+samples per subbasin within CTUIR ceded territory, 70+ samples already)
- Dorene- David Pilliod is building a USGS eDNA lab in Boise (sister to Wisconsin USGS lab).
- western ridged mussel SSA status (Courtney Newlon)
  - positive 90-day finding published this year (July 2021)
  - next step is the Species Status Assessment that describes the status and provides information to be used in the 12-month finding determination
  - 12-month finding will be published 9/30/24. Courtney is the lead for the SSA, still organizing internally for each state's leads. Partners will get a letter of notification next year. Any georeferenced data please submit, and there will be a data call for each state likely early next year.
  - Joel asked about deadline for information that will go into the process (Courtney doesn't know yet—one of her key questions)? Joel is hoping for 1-2 field seasons to be able to provide survey data to the USFWS. Courtney does not expect the date to be flexible based on conversations internally. She will be able to provide a drop-dead date. Joel mentioned that IDFG got permission to use Section 6 funding to do their surveys in 2021. Hard to time funding cycle with the current timeline and need more time.
  - Craig asked what the most important data is for the SSA. Courtney says when the USFWS ES teams from multiple states meet that they will be able to identify the best data needs. SSA development is built for as much data as available for a species.
- western mussel visual survey protocol development (Emilie Blevins)
  - Opportunity to align data collection, improve comparability of results, data collection to support conservation, distribution data gaps remain
  - Urgent need for more than just presence/absence, can maximize survey efforts
  - Protocols suitable for other states not well-suited to western mussels/rivers
  - Intent is to adapt existing methods and utilize emerging technologies
  - Initial core team: USFWS, BLM, CTUIR, Xerces
  - Review of existing methods, develop common terminology and establish basic metrics
  - Identify range of habitats and assemblages for testing
  - Testing and feedback stages, revision
  - Survey protocol rollout for use
  - Joel interested in field testing next summer, Dorene as well-said we need a good monitoring protocol.
- effects of fire on a California mussel bed (Andy Lawrence)

- Andy is working on Fort Hunter Liggett along central California coast, studying effects of fire and sedimentation in addition to mussel surveys. Presented on 2021 observation of impacts to mussel bed. Post fire - heavy rains, increased runoff and basically buried the mussels.
- Elizabeth asked if it was the sedimentation definitely that impacted the mussels. Andy said they definitely would have been buried under several feet of sediment but also exposed to VOCs after the fire. They didn't find any live mussels. Elizabeth also asked about any examples for mussels resurfacing after extreme burial? Andy wondered if maybe they did make it to the surface and were predated by raccoons. Previously the bed was protected in the deep water.
- Meeting ran up to the two-hour mark, save discussions of FMCS symposium, workgroup social media for next meeting. Thanks everyone!