



UC³/FWP 2021 AIS Early Detection & Monitoring Workshop (Virtual)

March 16th, 2021 12:30-3:00pm via Zoom

Participants: Tom Woolf (FWP), Chris Downs (Glacier National Park), Mike Koopal (Whitefish Lake Institute), Cynthia Ingelfinger (WLI/UCLN), Phil Matson (FLBS), Craig McLane (FWP), Stacy Schmidt (FWP), Jayden Duckworth (FWP), Russ Hartzell (FWP), Paul Kusnierz (Avista), Joann Wallenburn (Missoula AIS district, CRC), Alicia Dixon (CRC BSWC), Autumn Christenson (CEMIST), Colin Threlkeld (CEMIST BSWC), Jake Williams (USACE), Liz Lodman (FWP), Jennifer Riddle (FWP BSWC), Brant Dupree (MCWD & UC³ BSWC), Cassidy Bender (Commission Coordinator), Kate Wilson (Commission Administrator), Deb Tirmenstein (Montana Black Dog Service), Sue Mills (Yellowstone NP), Michael Locatelli (Yellowstone NP), Ron Zurawell (Alberta Environment & Parks), Tom Cox (Flathead Lakers), Lynn Maas (Friends of Lake Mary Ronan), Jim Baker (Friends of Lake Mary Ronan), Barbie Martin (Big Sandy CD), Danny Smart (East Kootenay Invasive Species Council, BC), Jim Grant (Lake Association), Dan Handlin (Little Bitterroot Lake), Radley Watkins (Missoula CD), Courtney Heetebrj (Okanagan Nation Alliance, BC), Cassandra Silverio (BC Ministry of Environment & Climate Change Strategy)

List of Acronyms			
AIS	Aquatic invasive species	FLBS	Flathead Lake Biological Station
BOR	US Bureau of Reclamation	FWP	Montana Fish, Wildlife & Parks
BSWC	Big Sky Watershed Corps (AmeriCorps)	GNP	Glacier National Park
CEMIST	Central Eastern MT Invasive Species Team	MCWD	Missoula County Weed District
CFC	Clark Fork Coalition	NPS	National Park Service
CRB	Columbia River Basin	NRCS	Natural Resource Conservation Service
CRC	Clearwater Resource Council	UCLN	Upper Columbia Lakes Network
CSKT	Confederated Salish & Kootenai Tribes	USACE	US Army Corps of Engineers
DEQ	Department of Environmental Quality	USFS	US Forest Service
DNRC	Dept. of Natural Resources & Conservation	USFWS	US Fish & Wildlife Service
eDNA	Environmental DNA	WLI	Whitefish Lake Institute
E & O	Education & Outreach	WRDA	Water Resources Development Act
EQC	Environmental Quality Council	WRP	Western Regional Panel

Agenda Overview:

- Introduction/Welcome
- Workshop Objectives
 - 2020 UC Basin Monitoring plan
 - Statutory duty of UC³
- FWP AIS monitoring program overview/updates
- Recap partner efforts 2020 & 2021
- Upper Columbia Lakes Network discussion
- Review 2020 UC Basin Monitoring plan
- Discussion
 - 2020-21 recommendations
 - New opportunities & ideas for expanding and improving monitoring
- Modifications & Updates for 2021 Plan
 - UCLN- continuance and expansion
 - Preservative access and issues
 - Production of a training video

Workshop Introduction:

UC³ Early Detection & Monitoring Committee

- Committee Objectives:
 - Develop annual monitoring plan
 - Develop recommendations for gaps/areas of improvement for AIS monitoring in the UC Basin
 - Provide feedback and oversight on the continuance of the Upper Columbia Lakes Network
- Members: Chris Downs (GNP), Craig McLane (FWP), Phil Matson (FLBS), Joann Wallenburn (CRC), Mike Koopal & Cynthia Ingelfinger (WLI), Lindsey Bona-Eggeman (MCWD), Katie Finley–Squeque (CSKT)

Objectives of Workshop

- Share information on early detection and monitoring efforts state-wide (and in Columbia River Basin)
- Review sampling methods and protocols
- Discuss updates/edits to 2021 Sampling Plan for development (for the Upper Columbia Basin)

Statutory Duty of UC³

- *Montana House Bill 622, Section 6, requires UC³ to monitor the condition of aquatic resources in the tributaries to the Columbia River and coordinate development of an annual monitoring plan.*
- The annual monitoring workshop is a coordinating effort to bring partners throughout the basin and surrounding area together to address gaps with AIS monitoring. The workshop provides a forum to give feedback to the agencies that are conducting monitoring.

FWP AIS Monitoring/Early Detection Season Review- Craig McLane (FWP)

Monitoring Program review:

- Why We Sample: To protect Montana's natural, economic, recreation and social resources; to get ahead of infestations (early detection of rare species is very difficult).

- What We Sample: Water quality, plankton-zooplankton and phytoplankton, invertebrates- macro in the field and micro via plankton tows, and macrophytes.
- New for 2020- Dive Team!
 - With staff support within the FWP fisheries division, the dive team is now active!
 - Opportunity as an AIS resource: rapid response, control work, and/or specific monitoring work.
 - Have started using a benthic sled (net attached to a sled that is dragged along the bottom of the lake to catch the top layer of lake bottom). Used in Tiber Reservoir, looking for adult mussels also used in Lake Elmo to assess the population of Asian clams. Plans are in place to drain Lake Elmo this coming fall (2021).
- View the FWP AIS Sampling Dashboard here: [AIS Sampling ArcGIS Dashboards](#)
 - Sampled 400 different waters in 2020, higher than normal because follow up on a ponds stocked by the Bitterroot hatchery after the New Zealand Mudsnaills infestation occurred.
 - Tracked back 3 years of sales from the hatchery. Able to sample ~90-150 ponds with nothing found. Mudsnaills found in Missouri river areas, unsure if from hatchery or infested river.
 - Areas that are not being sampled on the map is because there are not a lot of waterbodies in that area or water that is not as high of a risk.
- 2020 new plant detection: spiny water nymph (found a few years ago but nothing since 2020 in Frenchtown pond) There will be additional work looking into the impact of this small, relatively unknown species.
- FWP Monitoring Ranking System
 - All waters in Montana have a priority ranking: Risk 5 is highest priority and sampled first. Risk 4 are major waterbodies that get a ton of activity and are therefore high risk. Risk 1 are rural waterbodies with low activity.
 - If you would like more information on the ranking system, please contact Stacy Schmidt- FWP lab manager for the Kalispell and Helena labs.
- Tiber Reservoir: 120 plankton samples, shoreline surveys, eDNA (FLBS and BOR), benthic sled, USFWS divers, detection dogs, etc.
 - Inspected Christmas tree in the bottom of Tiber Reservoir.
 - We have finished year #4 since the detection of mussel in 2017, 2021 will be the last year of hard sampling before moving to delist Tiber Reservoir.
- Asian Clams detected in Lake Elmo, only population in Montana. Plans are in place for draining the lake and construction including improving the Lake Elmo state park will start Fall 2021. Passive drain 12-13' and pumps to drain last 3-4'; it will be drained all winter and refilled and restocked in April 2022.

2021 Sampling Plans

- Sampling will start mid-May and run through most of October.
- Similar to 2020 efforts ~2220 plankton samples from FWP alone. Slight uptick because we are trying to stay in line with the Western Regional Panel's recommendation of 3 samples per lake per year.
- Please see the meeting packet and/or contact Craig for the spreadsheets and documents detailing the 2021 sampling plans (including sampling plans from partners across the state and waterbodies listed in the ranking system). Partner numbers in those documents are estimates of what was done in the past.
- **ACTION: Partners to provide individual 2021 sampling plans to Craig McLane so he can update plan.**
- **ACTION: Craig to share excel sheet (not just PDF) that includes the ranking system with partners.**
- **ACTION: Craig to work with Phil (FLBS) to create a publicly shareable map of 2021 sampling plans.**

Questions & Discussion

- Discussion on sampling on the Blackfeet Reservation: FWP sampled their 4 major lakes in 2017 or 18 and they have done sampling with USFWS since. Milk River has been in the news quite a bit, good place to be looking. Hoping we can work towards that sampling effort in the future.
- If you have any information you would like to include in that risk assessment model and the criteria used, reach out to Stacy and Craig (opportunity to collaborate on next year's model). Working with Tim Conahan on risk assessment model, he is starting that process on the Missouri river basin. Would be great to do one specifically for Flathead Lake (specific locations on the lake).

Monitoring Partner 2020 Updates & 2021 Plans

- *Please see the meeting packet for all individual updates from partners. Additions are listed below:*
- Clearwater Resource Council- Joann Wallenburn, Monitoring Volunteer
 - Expanded monitoring scope by taking on 3 lakes that Blackfoot challenge and 2 lakes that Swan Valley Connections could no longer monitor, sampled all 5 times. Macrophyte mapping and hosted workshops on macrophyte invertebrate sampling as well.
- Alberta Environment & Parks- Ron Zurawell, Aquatic Scientist
 - In 2020 we sampled 67 waterbodies primarily lakes and reservoirs in the southern half of province, with help from Alberta parks staff, the lakes management society and the Alberta irrigation districts association. Additionally, three canine units surveyed 33 lakes and reservoirs across the province.
 - No positive hits for invasive mussels, however a positive case of Chinese Mystery Snail in McGregor reservoir in southern Alberta (probably present since 2015). Staff implemented transect sampling across the reservoir looking at depth distribution and a depth maximum ~4 meters deep. They are currently only in McGregor Reservoir (flows downstream through Manitoba to the Hudson Bay). The snail has not been detected in Traverse Reservoir, immediately to the south. Continuing research with eDNA testing for the snail, looking at whether they are incorporating into the food chain (food chain isotope work, fish or crayfish feeding on the snails).
 - Moss ball issue in Alberta has been primarily focused in the sale of blister packs. Alberta Environment & Parks found the distributor and other pet stores selling them in bulk and discovered adult mussels and veligers. Canadian government is working with provinces to regulate/deal with the situation.
 - Continuing research on molecular, viability testing for veligers as well as meno-genomic testing.
 - Waterton parks Canada is still implementing a 90-day quarantine period for infested watercraft.
- British Columbia Public Service- Cassandra Silverio, Ecosystem Biologist
 - Implementation of the annual lake monitoring program, with the East Kootenay Invasive Species Council, includes veliger sampling of waterbodies across BC based off a priority waterbody list.
 - Waterbody priority is selected based on new analysis with calcium data, vehicle risk assessment and high-risk watercraft inspection data for destination waterbodies.
 - Launched new inspect app for watercraft inspection data that loads into an online platform.

- Detection of Asian clams in Shuswap Lake: BC has a known population of Asian clam in south coast area, 2020 brought a new detection in Shuswap Lake. Actively doing extent surveys (started last fall) and dive surveys for more detailed distribution and data density.
- More information: DFO risk assessment (2012), this is currently being updated: https://www.dfo-mpo.gc.ca/csas-sccs/Publications/ResDocs-DocRech/2012/2012_174-eng.html
- Yellowstone National Park- Sue Mills, Greater Yellowstone AIS Coordinating Committee
 - In the process of developing a monitoring plan, with assistance from Erik Hanson and Adam Sapolvita. The state of Wyoming has been conducting plankton tows in two motorized lakes (Yellowstone and Lewis), fisheries group looks for range extensions (whirling disease and New Zealand Mudsnaills), looking to expand funding for monitoring and the plan (stay tuned).

Northwest Montana Lakes Network (NMLN) & Upper Columbia Lakes Network (UCLN) Update- Cynthia Ingelfinger (WLI)

- **Northwest Montana Lakes Network-** <https://nmln.info/>
 - Partnership with FWP and WLI since 2010
 - Purpose: Long-term water quality monitoring and AIS early detection sampling. Trains citizen scientists and supplies equipment for long term water quality data collection and sharing. Includes an annual in-depth water quality monitoring sampling visit by WLI scientist.
 - 41 lakes (not open to additional lakes), 50 sites in 4 counties with 50+ volunteers
 - Provided volunteers plankton tow nets, Secchi disks and water monitor.
 - Held 2 trainings with FWP in 2019, as of 2020 12 new volunteers from 8 partner groups, 16 samples from 10 lakes, 5 more kits to give out.
 - Data Collection Goals:
 - Establish lake trend data over time
 - Help determine the trophic status of lakes
 - Implement early AIS detection and prevention
- **Upper Columbia Lakes Network-** <https://ucln.net/>
 - Goal: Aims to increase consistency in protocols, incorporate new partner groups, add to the volunteer base, and allow more high priority lakes that are not currently monitored.
 - Strategy: Identifies interested groups within the region, provides equipment and offers training for AIS monitoring and decontamination protocols.
 - Supports UC³'s AIS early detection efforts and all data goes into the FWP database.
 - Engages lake groups and citizens in AIS early detection sampling and identification.
 - Provides equipment and training for AIS monitoring and decontamination protocols.
 - Citizen scientists monitor for invasive species with plankton tow nets and visual inspection.
 - Different from NWLM is that we can add additional lakes to UCLN but cannot with NWLM because of FWP restrictions.
 - Are volunteers being trained to sample multiple times throughout the year? This was the first year so there was a late start, volunteers weren't sure of capacity to monitor lakes, hoping to increase the number of samples every year moving forward as volunteers get more used to the protocols and monitoring.
 - Discussion:
 - Ideas/options for maintaining & expanding UCLN

- UC³ has been awarded BOR grant to ensure UCLN continues and expands in the future.
- Annual costs: Supplies, shipping, coordinator, travel, training
- Creation of training video (for use statewide)
 - Implemented one-on-one trainings for volunteers during covid but this is not sustainable in the future. Would like to create trainings videos with FWP staff to train volunteers on monitoring and use as a refresher year after year.
 - What are partners in the basin/state doing to reach the general public: are there materials out there, is a video needed, what would be good to create to get more boots on the ground, etc.?
- Kits located/distributed in key locations throughout the basin

Question & Discussion:

- Training video is a great idea, in addition we could reach out to the general population i.e. what can an individual citizen out recreating do when they see something, how do they report it, etc.
 - Could create a 3-tier monitoring training video: Tier 1- eDNA, Tier 2- plankton tow, Tier 3- visual
- Citizen science monitoring is currently focused heavily on mussels and we are missing the opportunity to educate the public on other species (invasive and native). Creating a see something, say something type program to raise awareness on what is out there and what folks should keep an eye out for.
 - Similar to the turtle program in the basin geared toward snapping and red eared sliders- citizens identify where they are and capture them.
 - Coach people how to take photos of identified species (apps available for that?) could create a citizen science FWP rack cards similar to the CDD anglers, boaters, irrigators rack cards. Rack card for homeowners or citizen scientists. Interest to pilot a wider audience, expand message, expand species, and possibly host a workshop. UCLN could take the lead and link together.
 - Species guides out there? We don't need to recreate things that already exist, but not all field guides are helpful for folks walking their beach (possibly pair down the Crown guide for UC basin or use crown guide as a tool and point homeowners to existing materials).
 - Any ideas for incorporating substrates off a dock program? FWP has templates on how to build substrates but has steered away from putting them in public (stealing) but substrates managed by homeowners on private dock works.
 - If there is interest FWP can provide guidance on construction and monitoring. Maybe not encourage putting out PVC pipes, could encourage homeowners to look at places on their dock repeatedly instead of creating more waste.
 - Substrate construction concept: <https://www.homedepot.com/p/16-in-x-8-in-x-8-in-Normal-Weight-Concrete-Block-Regular-H0808160000000000/312064971>
- Mussel Walk concept: Started in 2016 with CSKT (Mike Derglow), gathered ~300 kids and talked about mussels and then walked on the beach and looked for mussels. Following year introduced some curriculum (state accredited) into schools about AIS in general, then mussel walk at state park was the culminating activity of the completed curriculum with 4 different stations on the waterfront (boat with mussel stickers 'mock boat inspection', mussel dogs, CDD station 'BSWC CDD musical chairs' etc.).

Upper Columbia 2020 Monitoring Plan

View the 2020 Monitoring Plan here: <https://invasivespecies.mt.gov/uc3/reports-and-publications>

Review 2020 Plan Recommendations

1. **Provide recommendations on FWP Field Sampling and Laboratory Standard Operating Procedures**
2. **Coordinate annual early detection and monitoring coordination meeting and training**
 - To review the previous year's sampling efforts and results
 - Identify areas in need of sampling (or increased frequency/intensity)
 - Spring FWP led trainings around the basin to provide consistency in sampling amongst partners
3. **Refinement, development, and expansion of the FWP AIS database and data application**
4. **Refinement of eDNA Sampling Protocols**
 - Regarding detection probabilities: how many samples collected, where, and what time of year.
 - Improve our knowledge of the effectiveness of the eDNA approach
 - Address discrepancies between methodologies and communicate widely to partners.
5. **Continue to support the establishment and growth of the Upper Columbia Lakes Network**
6. **Veliger Survivability in Ballast Water Study**
 - Review 2020 BOR veliger ballast water survival study to inform risk potential and quarantine periods.
7. **Review FWP AIS prioritization of monitoring activities and plans in the Upper Columbia Basin in Montana and offer recommendations on improvement should opportunities be identified.**
 - Ex: Evaluating water temperature data could prioritize waterbodies by date for veliger sampling.

Discussion:

- How do we make the plan most useful? Forming recommendations into a goal or question that we can report back on at the end of the year (SMART goals) not to duplicate FWP plans but to add value.
 - We could pull recommendations/actions from the state plan that are important to factor in west of the divide and expand on those.
 - Point people to FWP site, reporting, etc. Share maps earlier? Shared lakes or waterbodies that we should be more focused on this year? Koocanusa for water quality and AIS.
- Update on recommendation #4- 'Refinement of eDNA Sampling Protocols': FLBS is working with a graduate student to take a look at the eDNA protocols. The proposal is out for final comments/review before it goes out to the general public and/or submitted to MISC.
 - Note: eDNA sampling protocols need to factor in the trophic status of the lake. For example: 100 long meter tows would not work on lakes in the clearwater area.
- Phil: We should engage northern partners in Alberta and BC more to expand the discussion/exploration in developing eDNA to incorporate metabarcoding. Metabarcoding: same as PCR for a single species, still replicating DNA we find in water samples but instead of one species, we can do for multiple species (wider net). Doesn't get down to species level, that is where normal PCR would help.
 - Uses multiple longer DNA fragments to provide information for multiple species. Metabarcoding still on research side, reason being data pipeline analysis hasn't been flushed out and comparative databases are not well established. Alberta and BC work on this is in progress but still several years away from operational level.
 - DFO eDNA standards document: https://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2020/2020_058-eng.pdf

- ACTION on 2021 plan:
 - Staff will draft 2021 monitoring plan and send to/meet with monitoring committee for review.
 - Add “identified in the UC basin” column to table #2 in plan.
 - Update/add case studies in the report (add beaver lake, living with EWM, fragrant waterlily MCWD, New Zealand Mudsnaills FWP, etc.).
 - Add notes to the 2020 recommendations with links to the studies, roll these forward into each annual plan with a status update section.
 - Prioritize the recommendations listed.
 - Incorporate UCLN into plan more and have a vision/direction for the future of the network (priority for 2021).
- ACTION: Staff will send notes out to the attendees w/ next committee meeting dates (review 2021 plan).
- ACTION: Phil to share results from graduate student eDNA study with the monitoring committee and draft map for 2021 sampling plan.

4. Action Items				
Action		Assigned	Due Date	Status
1	Send monitoring workshop notes out to group/attendees and doodle poll for next committee meeting.	Kate Wilson/Cassidy Bender	4/1/21	Completed
2	Chair/Staff will draft 2021 monitoring plan and send to/meet with monitoring committee for review and suggestions. (See notes for specification recommendations/additions)	Chris Downs, Kate Wilson/Cassidy Bender	mid-late April	In progress
3	Phil to develop map for 2021 sampling plan	Phil Matson, Chris Downs	Mid-late April	In progress
3	Phil to share results from graduate student eDNA study with the monitoring committee.	Phil Matson	TBD	
4	Partners to provide individual 2021 sampling plans to Craig McLane so he can update FWP 2021 spreadsheet.	All monitoring partners	On-going	
5	Craig to share excel sheet (not just PDF) that includes the ranking system with partners.	Craig McLane	3/16/21	Completed
6	Craig to work with Phil to create a publicly shareable map of 2021 sampling plans.	Craig McLane & Phil Matson	2021	In progress