

**Lake Champlain Basin Program
Technical Advisory Committee meeting
Held Remotely over MS Teams
Wednesday, September 7, 2022, 8:45 AM – 3:00 PM**

Approved TAC meeting summary

TAC Members: Jennifer Callahan, Ryan Davies, Dennis Deweese, Laura DiPietro, Bryan Dore, Curt Gervich, Peter Isles, Neil Kamman, Steve Kramer, Margaret Murphy, Michele Fafette, Oliver Pierson, Andrew Schroth, Lauren Townley, Daniel Tremblay

LCBP Staff: Mae Kate Campbell, Eric Howe, Meg Modley, Matthew Vaughan, Sarah Coleman, Erin Vennie-Vollrath

Guests: Laurie Earley, Kristin Underwood, Elizabeth Doran, Brittany Mosher, James Murdoch, Rebecca Diehl, Brendan Wiltse, Tim Mihuc, Luke Briccetti, Steve Libby, Karina Daily, Gary Henry, Carrienne Pershyn

1. Updates, announcements, public comments

- Neil welcomed TAC members back from their summer hiatus and noted this will be a dynamic season.
- Margaret: For those that follow the Fish and Wildlife Department on Facebook, we have been highlighting ancient fishes in Vermont. We've gotten good engagement. Credit goes to Shawn Good for educating and gaining interest from anglers about other species.
- Lauren T: The New York State Department of Environmental Conservation (NYSDEC) released a water quality improvement grant in May; we will go into scoring in September. I'll provide more information on what's happening in the Basin after then.
- Oliver: A few key water quality-related permits were re-issued in Vermont. The Municipal Roads General Permit (MRGP) went out on public notice yesterday, and the Transportation Separate Storm Sewer System (TS4) General Permit is out on public notice as well. These re-issued permits include improvements on phosphorus control in some watersheds. The National Pollution Discharge Elimination System (NPDES) Concentrated Animal Feeding Operation (CAFO) General Permit was issued over the summer. New water quality standards were put out in July, and a new wetland rule was put out in August that would help better identify class 2 wetlands. We have had a busy summer with new aquatic invasive species infestations. There is a new area of water chestnut infestation in Lake Champlain, and Eurasian watermilfoil were encountered in many new lakes. We have been working hard on containment and eradication. The Lake Carmi aeration system had its first summer of uninterrupted operations. Despite the system functioning, we haven't always been able to keep the lake to its target dissolved oxygen level. It seems like there's been internal loading, and there were many blooms this summer. The preliminary thinking is that the aeration system on its own might not be adequate to combat the internal loading and control blooms in the lake, which is

disappointing. We are working with our UVM partners on monitoring and data analysis and are beginning to think about next steps.

- Neil: The presentation provided by Mindy at the Lake Champlain Research Conference on Lake Carmi was compelling. Are the water quality standards through the public comment period?
- Oliver: Yes, they are, we held public meetings in July. We are sifting through the comments and working to get a final updated version out this month or next.
- Bryan: The Environmental Protection Agency (EPA) region 1 funding awards to LCBP and the Vermont Department of Environmental Conservation (VTDEC) have been finalized. This includes section 120 funding, infrastructure funding, and Total Maximum Daily Load (TMDL) funding. We are also in the final stages of executing an inter-agency agreement with the U.S. Geological Survey (USGS) for Environmental Sensitivity Index (ESI) mapping. I believe EPA region 2 is in the same place.
 - Neil: Thanks for the quick work on those agreements this year. Thanks to Lauren, Erin, and Sarah for their work on the state workplans.
 - Bryan: Thanks to folks at LCBP who have been working through the grey areas with the Infrastructure Bill guidance. We are able to wave match on infrastructure funds for this first year.
- Neil: This is the biggest LCBP funding year ever that we are going into. There are complementary lines of funding from LCBP and other agencies. In VT, we have just received approval to create a position that will be familiar with different lines of funding from State and federal agencies and LCBP. We are looking to hire a funding ombudsperson in December. This will be part of larger hiring process that will be associated with the infrastructure funding.
- Matt: The request for proposals (RFP) for Clean Water and Healthy Ecosystems planning and implementation projects is open. This RFP was previously called local grants/pollution prevention, habitat conservation, aquatic invasive species (AIS) spread prevention, etc. Categories we've added this year include funding for large Healthy Ecosystems and aquatic organism passage (AOP) projects. This RFP also includes AIS spread prevention and Clean Water planning. To complement the revisions to this RFP, we will be releasing the technical request for pre-proposals (RFPP) for research projects specifically. This year we are making the switch to separate research and implementation in our RFPs. LCBP is hiring for several positions – including the LCBP office manager and aquatic biologist positions. The grant specialist position and temporary publications assistant application deadline just passed. We have hired an AOP restoration specialist and will be announcing that person in October. I want to thank TAC members who have participated in having TAC point people for fiscal year 2022 (FY22) projects. I appreciate the effort – everyone's been really engaged.
 - Oliver: Plug for the aquatic biologist position. 130 days of field work per year!
- Meg: Erik Reardon started as the LCBP AIS outreach specialist out of the Warrensburg DEC office. Early detection monitoring efforts for round goby continue, including eDNA, trawling, and electrofishing. We added 4 sites to target areas like Great Sacandaga Lake and the mouths of tributaries that are possible sources. Québec is collecting eDNA and seining and will continue through fall. The U.S. Fish and Wildlife Service (USFWS) is wrapping up its metabarcoding effort, an AIS gateway monitoring program for native

species of concern and AIS. Over the summer we learned that the Québec Ministry of Forests, Wildlife and Parks re-ran 2021 eDNA samples for round goby and had 4 positives near the confluence of the Richelieu River and Lake Champlain. They followed up with seining and additional eDNA collection and have not found any fish or positives detections. We will have an update on round goby at the September Steering Committee meeting. The Rapid Response task force continues to meet every few weeks. The critical control plan for the Champlain Canal has been finalized and is available on the NYSDEC and Canal Corps websites. For outreach efforts, we are finalizing a number of products, updating LCBP webpage, and working on implementing a reporting tool. It has been a good and busy Boat Launch Steward season. There was a deluge of fishhook waterflea and less so spiny waterflea earlier in the season. We participated in an expansion of the Great Lakes landing blitz to gather data about spread prevention, and launched an educational campaign during that time as well. It was great to participate and we plan to continue that effort. In August, LCBP hosted partners from the U.S. Army Corps of Engineers (USACE) Engineer Research and Development Center and the NY District Office, including Commander Luzzatto. The partners toured the Champlain Canal to discuss the AIS barrier study, visited the South Bay of Lake Champlain to view the water chestnut mechanical harvesting efforts by boat and watercraft decontamination, and visited the Vergennes stormwater project tour including the signing of the Aquatic Plant Control Program contract. The second day of the tour included a discussion of the USACE program and project opportunities, harvesting of water chestnut by hand in canoes with VTDEC at the Sandbar wildlife management area, and a trip up to St. Albans to discuss the nutrient management modeling project.

Review and approve summary of previous TAC meeting

- Motion to approve the June meeting minutes: Margaret
- Second: Jenn
- Discussion: Margaret provided 2 minor spelling corrections.
- Vote: All in favor to approve as amended by Margaret.

Review TAC 2022-2023 schedule

- Matt reviewed the TAC scheduled for 2022-2023. He noted times TAC will be asked to participate in independent review of materials outside of meeting times. The March meeting is planned for the 2nd Wednesday of the month instead of the 1st. TAC members will be completing a survey to gauge their preferred format for future meetings.

2. Discussion: FY23 research priorities

- Matt provided an overview of the technical request for pre-proposals (RFPP) process and timeframe. The goal today is to create a suite of research priorities to recommend to the Steering Committee that would go into the RFPP. Matt reviewed the split between research and implementation projects in this year's RFPs. Implementation projects may have aspects of research (monitoring success), and research may have implementation components (pilot study) but the separation is going by main focus of project. Dividing research and implementation has been requested by TAC in the past. Matt reviewed the technical RFPP priorities from last year. Projects will get bonus points if they address

any of the priorities. *Opportunities for Action 2022 (OFA)* was released this year and contains many research priorities. Matt shared and reviewed a survey containing research priorities from OFA 2022 for TAC to prioritize for this year's RFPP.

- Matt presented the top 5 priorities as ranked by TAC for Clean Water and Healthy Ecosystems and the additional responses TAC members provided.
- Neil: #4 on Clean Water, increases wasn't an evident part of that priority. It makes more sense if that is included. In tributaries where you see unexplainable increases in nutrient concentrations, that provides a research opportunity.
 - Matt: I think this priority gets at understanding why we are seeing the trends we see from the Lake Champlain Long-Term Monitoring Program (LTMP) data.
- Andrew: Reviewing last year's projects, I felt we were propping up a few projects that wouldn't have been competitive if they weren't addressing a priority. Since we have a larger pool of funds, it could be good to cast a wider net.
 - Matt: Were there any here that are broader that you'd advocate to keep?
 - Andrew: Something like climate change is of such broad interest, we could cast a wide net for how climate affects clean water and habitat.
 - Neil: There is a lot of activity in the climate change space already.
 - Matt: The Steering Committee has identified climate change as a priority.
- Curt: #2 under Clean Water reads to me like it already has a specific project and outcome in mind. This one feels narrowing. I think we should scale up the language in some of these to broaden them out so we receive more proposals. I agree with Andrew.
 - Neil: The LTMP is exactly that, an established program. I would be uneasy to fund short initiatives when we want to create a long-term stream of data. I don't disagree with additional monitoring expansion.
 - Matt: I feel this one should not be in the RFPP, but it could be an internal priority.
 - Curt: I want to institutionalize expanded monitoring while we have the budget. Could we create an endowment for long-term monitoring?
 - Andrew: Would it be useful here to push for people to use some of the data that's coming online? Wording like 'research derived from ongoing monitoring provided by LCBP and others'.
- Sarah: This is a good exercise. Some of these priorities, to research well, are long-term initiatives. As part of this discussion, we need to be thinking about which of these research priorities warrant a longer-term commitment that LCBP and partners could champion internally. Others might lend themselves better to shorter-term research projects through the TAC.
- Peter: Echoing what Andrew said, maybe aligning with the priorities shouldn't be as heavily weighted in the ranking process this year.
- Neil: I have interest in #1 for Clean Water on the VT side at least.
 - Oliver: There are other studies going on, but I was thinking more of this one taking a step back and looking at cost-benefit analysis of these types of work, where have innovative interventions been effective. It's probable that those types of questions are being addressed in individual projects.
- Oliver: I also liked the per- and polyfluoroalkyl substances (PFAS) suggestion that was made.

- Neil: That one would be timely in the drinking water space and wastewater space. The Steering Committee will find this interesting fodder to discuss at the very least.
- Matt: I think the EPA has not released updated monitoring guidance at this point, so I'm not sure if it's far enough along as official guidance to warrant research.
- Neil: I think it's worth bringing it to the Steering Committee for consideration.
- Bryan: By the time these priorities are funded, we'll be much further along with guidance and rules.
- Curt: I would propose to highlight #4 in Healthy Ecosystems. Efforts won't be effective if there are state and local policies in the way. I haven't heard enough discussion to be confident in the consensus on these priorities.
- Margaret: We should plan more time to discuss these next year. To the one that just got highlighted, I'm not sure what kind of research proposal we'd get for that. #4 under Clean Water I think is useful (groundwater). More research focused in this area would be helpful.
- Peter: Of the priorities we've identified here, there's not a lot of space within them for in-lake work. I'd make a plug for in-lake research within these priorities as well.
- Neil: I agree with Meg that we need more AIS focus. Let's continue this discussion over email and have Matt summarize additional developments.

3. Full workplan review: Evaluating habitat function in floodplain natural communities of the Lake Champlain Basin to support conservation and restoration prioritization (Dr. Elizabeth Doran, UVM)

- Dr. Doran introduced the project and provided an overview of the project team. This project is motivated by the history of landscape alteration in Vermont, which has contributed to challenges with nutrients and flooding. This project has 4 main objectives: Define reference conditions and construct models to perform a departure analysis of floodplain habitats, develop mapping of estimated habitat departure from the natural condition in Lake Champlain floodplains for stream reaches with drainages greater than 2 square miles, validate distribution and functionality of mapped floodplains using field surveys, and project prioritization framework development. Liz provided an overview of previous work completed that will support the project, including connectivity mapping for habitat assessment, high-resolution floodplain and sediment regime mapping. The project team reviewed all tasks and provided an overview of the methodology that will be used in the project.
- Margaret: Thanks Liz and the entire team. The presentation filled in a lot of gaps for me. I didn't completely understand how this was working and the rationale. I still have questions about the species selection, since they are difficult to find how useful will they be for modeling purposes? I think for me a bit more detailed understanding of those decisions and an overarching understanding of how this is useful in the long-run would be useful.
 - James: At the beginning of the project, we wanted to select species that were genuine indicators of quality. On the amphibian front, I think we'll have much

richer data. Otters are difficult to study but are a species of greatest conservation need. There are opportunities for backups like other large mammals.

- Neil: Incorporating the backup possibilities in the quality assurance project plan (QAPP) would make sense.
- Michele: I found this workplan confusing. I am still missing the temporal correlation for this proposed project. There seems to be an assumption made that areas that were restored were restored correctly and haven't been damaged, but there weren't any plans provided to reassure that the restoration actions taken were appropriate for the site. How will you address that?
 - Liz: There are limitations in the existing landscape. In order to make sure that some of those assumptions are incorporated into the data, we are collecting data on restoration and conservation activities performed and when they were implemented as best as we can. We are also doing site assessments at every place, which includes data like human disturbance and the presence of AIS. We are trying to use the best available data to establish a temporal timescale within a 2–3-year project.
 - Rebecca: The timescale since restoration data we can get from our partners. The idea with this project is that along with the natural community surveys, we are linking those data with the current condition of the floodplain. Ideally, we see that things that have been conserved/restored longer have greater function.
 - Michele: In restoration, it generally takes decades for any true measure of the success of a project to be determined. Can this project work on the proposed timeframe?
 - Liz: We recognize that and that's why we are focusing on the Lewis Creek watershed, since it has a long temporal history of active restoration and records of that work. We are working with the wetlands folks at the state who have assembled a restoration gradient. The general understanding is that different natural communities take different lengths of time to re-establish. We want floodplain forest to be preserved if they exist and recognize that where they should exist will take a long time to re-establish, and that may require a restoration and preservation action.
 - Michele: I am not sure how effective a project like this will be.
- Michele: I am curious about invasive species. It seems to me like you are assuming that all these areas are pristine and can reflect other areas.
 - Liz: The presence of invasive species is factored into the natural communities map. Our target is to examine as pristine as possible natural communities, mapping where they should exist and their departure from pristine conditions (hydrologic, anthropogenic). When we complete the natural community assessments in the field, we note the presence of invasive species, and those get incorporated into the grading and the departure of the natural community itself. We are focused on presence first, and then gradation/departure from ideal condition. The majority of the examples are grade B, which may have some invasive species. Those are the ones we are using to build our models.
- Michele: Did you consider any alternative species that may be more readily available?

- Liz: We identified the most likely and best-representative species. We will be working to identify the most appropriate sites and amphibians for the amphibian assessment.
- James: In our QAPP, we'll identify backup species that could be used.
- Neil: Description in the QAPP about alternate species or how you may use other mammals that trip the camera would help out. There is high-quality habitat in the Lewis Creek watershed.
 - Michele: That's the type of local knowledge that was lacking in the workplan. I prefer proposals to be written such that anyone can pick them up and clearly understand. Thanks for providing additional information in this presentation.

Motion: To approve the workplan with plans to include additional information from this discussion in the QAPP.

Motion by: Margaret

Second: Michele

Discussion: None

Vote: All in favor

Abstentions: Andrew Schroth

4. Full workplan review: *Mirror Lake and Lake Champlain road salt study: combined project* (Dr. Brendan Wiltse, Adirondack Watershed Institute)

- Matt noted that there were two projects awarded by the Steering Committee to the Adirondack Watershed Institute (AWI), which LCBP combined into one project for administrative purposes. Brendan will present on both projects today.
- Brendan began with an overview of the Mirror Lake Stormwater Assessment project. He provided background on land use and development in the Mirror Lake watershed. Mirror Lake has been affected by increasing salinization, and best management practices (BMPs) have been installed to address salinization. This project aims to evaluate the effects of stormwater BMPs in Mirror Lake by comparing reference conditions before BMP installations with data from during (2021-2023) and post (2023-2026) BMP implementation. Other long-term water quality data on Mirror Lake will also be analyzed. There will be a two-factor design to look at the 1) reference vs assessment periods and also 2) look at the surface vs bottom of Mirror Lake.
- Brendan then provided an overview of the Lake Champlain Basin salinization project. The project aims to create a central database of lake water quality data for lakes within the Lake Champlain basin, analyze the long-term concentrations, trends, and drivers of chloride in lakes in the basin, and provide a more informed understanding of where to focus strategic investments in salt reduction practices.
- Lauren T: For the Mirror Lake project, were municipalities or the Department of Transportation tracking road salt usage during the reference period?
 - Brendan: They were not, but we do have purchase data that we can use to extrapolate application.

- Neil: Along the Winooski River, you have major interstate corridors adjacent to the river all the way to the Lake. Analyzing class 1 and class 2 roads within X distance from the mainstem might be an interesting analysis for the grad student to undertake.
 - Brendan: I agree. Also, when you look at the lake-scale, proximity of roads is important and density is likely more influential.
- Andrew: For the Mirror Lake project, is there a reason that you are not analyzing dissolved phosphorus?
 - Brendan: Historically, we have not analyzed phosphorus in this watershed. We are evaluating the addition of dissolved phosphorus to our monitoring. We will not have it for the reference period.
- Andrew: For the Lake Champlain basin salinization project, is the chloride yield data derived from weighted regressions on time, discharge, and season (WRTDS) data, and are you concerned about data skew due to lack of winter sampling?
 - Matt: Yes, the WRTDS data are the source. It is a good point that we are under-sampling in the winter, but the method does account for seasonality as best as possible. We don't have good sampling data in the winter.
 - Andrew: We will have a ton of water samples at the DEC monitoring sites that were collected during winter, and we could help to confirm that model.
- Neil: You may want to consider referring to road salts as deicing salts.

Motion: To approve the workplan as delivered.

Motion by: Jenn

Second: Andrew

Vote: All in favor

5. Full workplan review: *Assessing the management and impact of private road crossings in the Lake Champlain Basin* (Dr. Timothy Mihuc and Luke Briccetti, SUNY Plattsburgh)

- Tim introduced the project, which is a collaboration with Liz Doran, Kim Coleman, and Luke Briccetti. This project will be an extension of prior work Luke has completed on assessing the impacts of private road crossings in the Lake Champlain basin.
- Luke reviewed the negative impacts of poorly designed or installed road-stream crossings and noted that most efforts addressing road-stream crossings are focused on public lands. This project seeks to investigate where stream-road crossings are located, assess how landowners are addressing their stream-road crossings, educate landowners on the importance of proper road-stream crossings, and conduct field assessments to survey the conditions of road-stream crossings on private lands. The project will involve a combination of GIS desktop analyses, surveying landowners, and field surveys.
- Neil: In the fisheries assessment, I'm wondering about the effect of low water. I know you said sampling will be opportunity-based, just wondering how you'd handle low water?
 - Tim: We'll be in the same window for sampling, mid-July. We've been sampling in VT in low water this summer. We just need to have a stream bed that's not dry.

If it's dry, we won't do the fish assessment there. Similarly, if a site is backed up due to beaver dams, we won't do the fish work there either. Many crossings on private lands are more wetland than stream.

- Margaret: Informative presentation. Survey response rates can be poor. What are your backup plans or what other ways are you hoping to get landowners more engaged? Have you looked at incorporating an electronic response as well?
 - Luke: We have looked into electronic responses and have been using that method this summer. We've had a good mix of online vs. written responses and intend to continue that moving forward. We just sent out the second follow-up mailing and had an 11% response rate after the initial mailing. We will also be using our network of local partners to expand outreach.
 - Liz: If survey response rates are really low, we can start doing direct outreach.
- Sarah: It looked like you shared a subset of the survey questions. I'd like to learn more about your goals and if you have a hypothesis. It looks like you are asking about water quality impacts downstream; I'm curious if there's questions about the benefits of culvert management onsite for landowners? It could be nice to ask about motivations for culvert maintenance. Another related thought, your work could have an opportunity to summarize best practices around landowner outreach.
 - Luke: We will ask more specific questions about water quality in the survey and we need to be careful about not leading the respondents to answer in a specific way. Some of the in-person outreach and training will be to do direct education about culvert best management practices.
- Sarah: There might be a relationship between road culverts and other surrounding landscape events. There might be an opportunity to ask questions about other observed impacts to culverts.
 - Luke: Yes, we do have some questions and response options that speak to that question.
- Neil: Why aren't you examining first-order streams? I imagine there are a lot of those. How consistent are these methods with or how do your methods build on the Regional Planning Commission methods being used in the Lake Carmi watershed?
 - Luke: I am open to adding first-order streams to the workplan. If we look at every first order stream, I thought that could be an impossible task, but I could be convinced otherwise. With regards to the Lake Carmi work, this project is slightly different. In Lake Carmi, they were looking at implementing the road erosion inventory work into private roads, and that really made sense in terms of the roads right on the lake. This project is looking at crossings specifically, and I am unsure how feasible it would be to do road erosion inventories for this focus.
 - Neil: I understand. If you see any obvious erosion issues, I'd encourage you to note them and send that information to the Clean Water Service Providers so they can follow-up.

Motion: To approve the workplan as delivered.

Motion by: Margaret

Second: Jenn

Vote: All in favor

6. Brief workplan presentation: *Winooski River Dam Removal and Corridor Protections*
(Steve Libby, Vermont River Conservancy)

- Steve: This project has two parts, dam removal evaluation and floodplain restoration. The dam removal portion is focused on examining the feasibility of removing four dams in the Winooski River watershed – three on the mainstem, and one on a tributary. If the dams are removed, it will open up 60 miles of river habitat. This project will address sediments and increase flood resilience by restoring natural channels. Specific tasks for the dam removal project include completion of dam removal engineering sequences, completion of 30% designs and development of a hydraulic model based on different dam removal scenarios, the collection of field data for addressing sedimentation, a concurrent evaluation of in-stream recreational opportunities that could be created as a result of dam removal, identification of a suite of dam removal options, collection of stakeholder input on the removal options, the development of cost estimates, and final design/permitting. The second part of this project involves working with landowners to help with river restoration projects in the Great Brook and Stevens Branch watersheds.

- Neil: It might be beneficial to provide more documentation about the extent of contamination of sediments behind dams, as that would help to explain the cost of the removal of the dams. You also raised a concern about the low-head dam safety issue. This is not commonly talked about during removals. When you contract for the dam removal do you plan to have a common approach?
 - Steve: We want the contractor and the hydraulic model to include all 4 dams so we can run the alternatives analysis comprehensively. We need to think about whether we want to remove all the dams at once, sequentially, or in a specific order. Aquatic organism passage is also a function of taking out all the impediments, and the recreational options will be enhanced if the entire system is restored.

- Margaret: It's helpful to know the dams will be worked on together. The plan is to go from 30% to final design in 9 months. Is that a realistic schedule or do you think you might need more time to consider analysis?
 - Steve: We have achieved that timeframe before with another dam, but it might be tight with the 4 dams. If we can extend the time out a bit longer that might be a good idea. We will sample for contaminated sediments early in the process. We would like to push it along as quickly as possible. Stakeholder engagement might be more complex for these 4 dams as well. 2 of the 4 dams are in the process of failure.

- Neil: It would be helpful to be clearer about which components of the dam removal will be completed or supported by whom. Also, please ensure that the block grant from VT state is not used as match for this project. It can be described as 'leveraged funds'.

7. Brief workplan presentation: *Reconnecting VT Rivers through Dam Removal in the Lake Champlain Basin*
(Karina Dailey, Vermont Natural Resources Council)

- Karina noted that this is the third year that the Vermont Natural Resources Council (VNRC) has received funding from LCBP for dam removal feasibility and implementation

in Vermont. Last year, funds supported the removal of 2 dams – Johnson’s Mill and Dunkley dam—which opened up 35 miles of stream habitat. Funds from this award will be used for removal scoping for 5 dams that have already been identified: Youngs Brook Dam in West Rutland, one out of three potential dams in Barre, Wainwright Mill Dam in Salisbury, Bailey Dam in Montpelier, and Connolly Pond Dam in Shrewsbury. Funds will also support initial scoping and identification of 8-12 new dams. Karina provided an overview of the dam history and site considerations for the already identified 5 dams. She detailed the methodology for project selection and prioritization based on ecological impact, hazard classification, dam owner interest, and partner support. Implemented projects will result in removal of impounded sediment, reconnection of river habitat, support of local watershed groups, improved recreational opportunities, community resilience, community outreach and engagement.

- Margaret: I am curious about the timing you propose for the removal of Bailey Dam vs. some of the other projects that might be more timely. I am also wondering why you would choose one out of three dams in Barre?
 - Karina: Thank you for this feedback. We are trying to spread the projects throughout the basin as much as possible and not spend too much on any one dam, but we can focus on one dam if the TAC would prefer. I write these proposals with the best information we have at the time of the application, but sometimes things change when we get to this point in the process. I am happy to approach this and future applications however TAC feels is most appropriate.
 - Matt: Historically with this recurring project, VNRC begins the project and then pursues a project amendment after a year. LCBP has that expectation given the nature of this work.
- Neil: We should have the two dam removal-related project teams discuss with LCBP the best path forward for all projects. Given the numerous potential funding sources for dam removal at this time, it may be best to prioritize the most difficult projects to fund or consolidate. I am flexible as long as great big pieces of concrete are removed.
 - Karina: My approach has been to spread the funds around, but we could definitely prioritize one dam. It is true that there are many potential funding sources out there, but we have only received support from LCBP for the last three years.
- Andrew: You mentioned rising costs – it will also be important to consider inflation and other moving factors as these projects progress.
- Neil: The Wainwright Dam is exciting because the river system is very rich downstream but not upstream.

8. Brief workplan presentation: *Evaluating Functional Uplift and Microhabitat Effects of Stream Restoration Projects* (Carrienne Pershyn and Gary Henry, Ausable River Association)

- Carrienne introduced Gary, the Ausable River Association’s (AsRA) stream restoration manager. Gary noted that stream restoration projects are increasingly being to remediate river systems that have been affected by a multitude of disturbances, including industry, settlement, infrastructure, and climate change impacts. Damage to

sections of rivers and streams can cause widening, decrease natural habitat, and threaten infrastructure and communities. However, there is usually a lack of monitoring after restoration projects have been completed. This project intends to use geomorphic and biological assessments to evaluate the functional uplift and microhabitat impacts of stream restoration in order to document the effectiveness of streambank restoration efforts on the quality of habitat for species in the Ausable River watershed. AsRA will undertake monitoring for 3 years at a number of restoration, control, and reference sites. Specific methods of monitoring will include geomorphic stability surveys as well as macroinvertebrate, algae, fish, and biological habitat assessments.

- Neil: This is a very interesting project. Would you agree that there is a possibility of not seeing the effects of a treatment?
 - Gary: It can take years to see changes in the biological makeup of macroinvertebrates. The act of restoration can be harmful in the short-term. AsRA intends to continue to build on the baseline of monitoring that will be gathered even after this project concludes. We do recognize that environmental impacts can and will happen.
 - Carianne: We chose to study all 8 sites for all three years to ensure we have as much data as we can get from projects that were completed in 2021 and will be completed in 2022.
- Margaret: Having a few years for each site is best. Macroinvertebrates will be a better indicator of environmental response than fish species. These are not highly diverse areas, so I would not expect a change to species types, however species size may change.
 - Carianne: Some of the in-stream impacts might impact habitat use by species. For example, strategic wood additions.
- Michele: When I reviewed the proposal, I thought this project would have benefitted from including additional details. This presentation cleared up many of my questions. I think it would have been helpful to include diagrams or photos to provide a reference of the order of stream being studied. Are there any concerns that the disturbances to the rivers might re-occur? Also, I am unclear on how bank migration will be measured.
 - Gary: For lateral migration we would look at meander width ratios. The vertical component will be covered in a lateral profile and cross sections.