

**Lake Champlain Basin Program
Technical Advisory Committee meeting
Held Remotely due to COVID-19
Wednesday, October 7, 2020, 8:45 AM – 3:00 PM**

Approved TAC Meeting Summary

Attendance: Bill Ardren, Kevin Behm, Jean-François Cloutier, Jennifer Callahan, Ryan Cunningham, Ryan Davies, Bryan Dore, Lauren Townley, Curt Gervich, James Jutras, Neil Kamman, Steve Kramer, Mark Malchoff, Bridget O'Brien, Mario Paula, Andrew Schroth, Angela Shambaugh, Jamie Shanley, Leigh Walrath, Ryan Patch, Ryan Waldron, Margaret Murphy

LCBP Staff: Matthew Vaughan, Mae Kate Campbell, Lauren Jenness, Sarah Coleman, Meg Modley, Elizabeth Lee, Eric Howe, Jim Brangan

Guests: Stephanie Hurley, Amy Macrellis, Polly Crocker, Eric Perkins, Dave Braun, Oliver Pierson, Talia Crowley, Tom Berry, Mark Ferguson, Tracy Brown, Jacob Fetterman, Matt Mayfield, Brendan Wiltse, Carrienne Pershyn, Kelly Cerialo

**Workplan review: Efficacy of the 2017 Vermont Stormwater Management Manual
Bioretention Soil Specification in Removing Pollutants and Supporting Plant Health**

- Polly Crocker and Stephanie Hurley presented.
- Neil: I am curious about the large % loss of Fe shown in the table. Why is that happening?
 - Stephanie: I believe that came from one of Hunt's studies. Iron negative loss indicates leaching. Neil: Is that a reducing iron kind of thing? Then any phosphorus bound to the iron would be gone. Stephanie: Studies have been examining these phenomena in lake sediments and retention ponds. Bioretention design goals originally centered on just holding water on the landscape, they didn't examine these dynamics as closely. We will be examining metals in this project, which is why I wanted to cover this background.
- Leigh: Is there value in simulating a winter storm event for the study, possibly to see if they act differently in the winter due to root structure, etc.?
 - Stephanie: the autosampler piping can freeze in winter, though we have been able to do winter sampling before. Our team will need to think about that as people do want to know what happens in the winter. The planter format envisioned here is raised beds.
- Angela: when you let the containers dry for 6 days before doing storms, is there a reason why we want to measure moisture content of containers? Is this based on the assumption that when plants aren't growing, we may see more water movement?
 - Stephanie: this is a relatively affordable measurement to reduce water sampling. If you can strategically find spots in planters where you can test the moisture content of soil it may make sense to do. We hope that simulating the wet and dry periods would help us to understand how the system behaves in mimicked field season conditions. Re-wetting has been shown to re-release phosphorus from

soil. We want to make sure to have different hydrologic regimes represented in the study.

- Margaret: I'm curious how vegetation survival accounts for nutrient change.
 - Stephanie: vegetation does affect nutrient content. We plan to do an end of the season cutback, as done in ideal planting system. This would remove nutrients. Studies have recently established that the role of vegetation is not just decorative, but also removes nutrients. This dynamic is important and by studying it we can statistically can see if there is a relationship between plant health and nutrient uptake. We are only taking the above ground biomass as the plants are perennial species and it is not practical to harvest the entire plant.
- Eric Perkins: This is a great project and I know from talking with VTDEC Stormwater Program staff that the results of this study will be useful. Can you speak to the role of the literature review? From reading the workplan it seems like the results of the literature review will be used to help inform the design specs for 4 different systems, though the workplan already has numerous details.
 - Polly: The literature review is considering other studies with the main goal to see the developments on bioretention specifications across the country. We would be looking at and gauging where VT standards sit and measure up with latest and greatest in other States. We would be researching the different recommendations for the composition of soil, guidance around testing, lessons learned, additives, etc. This would lead us to what can be improved in the VT Stormwater Manual.
 - Stephanie: I would add that in an ideal world we would fully complete the literature review before beginning the project, however based on the grant timeline it is really two different projects. The literature review would help us understand the lay of the land and different specification recommendations across the country. It would help us understand where VT falls in the recommendations. However, for the study piece of the project, we are trying to pin down the answer to the compost question. In VT there are projects going in where people don't know the best method to install rain gardens.
 - Eric: To summarize, the final report may make recommendations from both the literature review and the study, which may overlap and may expand upon one another.
- James Shanley: can you confirm that you are controlling the soil moisture?
 - Stephanie: Yes, we will start the planters indoors then move them outdoors with covers to exclude rain as we want to control hydrology. There is room to move on what is the perfect design for hydrology so we can take recommendations from TAC members.
- Sarah Coleman: I'm curious about the later trial, where you are adding additional compost. Will it be defined as the type of compost i.e. low phosphorus compost?
 - Stephanie: We have gone back and forth on that. Right now, there is a statistical difference. The current VT Stormwater Manual suggests that if you use low phosphorus compost, you will meet the specifications. Through the study we are also trying to figure out if you can use compost with feed stock (dairy manure) as it is hard to find low phosphorus compost in VT. We are reserving 6-8 weeks to

figure out if we can get materials that meet the specs the trial #3. We want to make sure whatever medium is chosen for use in the study is a medium that people can get in VT. We can compare #1-#2 without a burst of compost, we can compare 1# to #3, #3 to #4. The question is how to statistically compare #2-#3. We may need to try and use different composts.

Workplan review: Uniform Accounting of Soil and Sediment Phosphorus Reductions in Evaluation of Water Quality Project Benefits in Vermont (*Polly Crocker and Amy Macrellis, Stone Environmental*)

- Amy Macrellis presented.
- Neil: Will you be processing your samples with the UVM agricultural lab or the Vermont State environmental agriculture lab? Amy: We'll be working with the UVM Soils Lab.
- Eric Perkins: Excellent project. 2 comments - both the workplan and your comments included references to the difference between total and available phosphorus, and you state that the focus on total phosphorus might overestimate the benefits of a project. I'd like to remind everyone that the TMDL was written based on total phosphorus because it's difficult to accurately measure and break up the different fractions of phosphorus. Given that, I don't think it's appropriate to say that if you focus on total phosphorus you may be overestimating the benefit of a project. Projects that focus on available phosphorus might be a better bang for your buck, but I don't think that this project should start with the assumption that assessing total phosphorus is overestimating. My 2nd comment regards the different categories of projects you will be assessing. Systems like bioretention systems for instance, those are not all based on the amounts of sediment, there's other factors at play there. The way that those types of practices have been more effectively measured is through long term studies, I don't think we're going to get useful answers by measuring sediments in those places, vs. measuring sediments coming from dam removals, gully erosion, street sweeping, etc. My suggestion is to give less emphasis to the stormwater BMPs for the reasons mentioned. To the extent that they are included, I suggest relying more on results of long-term effectiveness studies for the stormwater practices – these results typically include the phosphorus fractions in the input and outputs, as you know.
 - Amy: I agree very much with your assessment of which types of clean water projects we included in our outline might be appropriate for including in this project.
- Neil: My point is regarding stormwater practices vs. non-regulatory restoration practices. Based on my observation of the landscape, your focus not only on dam removals but on work that complements functioning floodplain works and gully erosion, I think are really valuable inquiries on this. That would be my suggestion on where to focus.
- Leigh: Great project. One suggestion regarding dam removal, I know on the New York side of the basin we require a lot of sediment contaminant testing. I wonder if you can tap into the Vermont regulatory world, if they are gathering the same information and could expand knowledge of what's in these sediments.
 - Amy: Our involvement in these projects thus far is that there's variability in what's being tested for and what's of the most concern. What's prioritized varies a bit

based on the upstream conditions, the dam being removed, and what's been impounded.

- Neil: Computations of sediment phosphorus reduction potential are often presented in grant applications. Being mindful that the State doesn't take those numbers to the bank, dam removals are quite poignant in this respect.
- Andrew: I'm interested to see the dam removal piece. Looking at the existing literature, it's variable how removing a dam will impact the sediment. Considering existing data in river networks could be informative for detecting how this might go.
- Sarah: I'm curious whether accounting for geography or native soils is appropriate to include in terms of understanding the reduction of phosphorus from sediment and soils; If the impact of the practice isn't equal across different landscapes.
 - Amy: That's a good question, we will at least document the characteristics of sites and potential projects. It will at least give site context and conditions, but I agree that analyzing those data might be above and beyond this project.
- Neil: Who wants to be on the project advisory committee?
 - Andrew Schroth
 - Eric Perkins
 - Lauren Townley
 - Dave Braun: I think Frank Magilligan at Dartmouth might be interested. His team has been looking at sediment and phosphorus transport past dams.
 - Neil: I'll do some email outreach as well.

Motion: To approve the workplans as presented.

Motion by: Jen Callahan.

Second: Leigh Walrath

Discussion on the motion: None.

Vote: All in favor.

Abstentions: None.

(Lauren) Updates, announcements, review and approve summary of previous TAC meeting

Updates and Announcements

- Jamie Shanley: the drought has alleviated itself somewhat with the 3" rain event at the end of September. Some areas are still in drought, especially in NH and ME. The USGS NY office is going to be strapped and will need to cut gauges across the State. In the Lake Champlain Basin, the Saranac River and East Branch of the Ausable gauges are being discussed as possibilities for cut.
 - Margaret: The East Branch of the Ausable would be an unfortunate cut.
- Ryan Patch: VT Agency of Agriculture, Food, and Markets (AAFV) was awarded a \$7 million Regional Conservation Partnership Program (RCP) Alternative Funding Arrangement (AFA) grant from the US Department of Agriculture Natural Resource Conservation Service (USDA NRCS) to implement a pay for phosphorus program across

VT. We are working on developing this concept with partners and are excited to begin working to deploy and implement the program. The focus of the program is on paying for results and tying them to the Total Maximum Daily Load (TMDL). We hope to get a comprehensive look at the practices farmers are implementing. This would expand on work of the Farm Phosphorus Reduction Planner (Farm PREP), which will be the backbone of the accounting process. This will be a 5-year program.

- Bill Ardren: US Fish and Wildlife Service (USFWS) started our sea lamprey control work. Staff just implemented treatment on the Winooski late last week.
 - Meg added that the treatment on the Missisquoi River was delayed.
- Oliver Pierson: VT Department of Environmental Conservation (VTDEC) is planning to turn off the aeration system on Lake Carmi on October 15th, given there is full lake mixing, despite persistent blooms on northern half of the lake. This is Angela's last TAC meeting, as she retires from VTDEC after 16 years of service on Friday October 16th. She has made incredible contributions to the Lakes and Ponds Program and we wonder how we can replace her position.
 - Matt: Much appreciation from LCBP staff to Angela. Angela is an amazing asset to our work, always helpful. You will be missed.
 - Andrew: from UVM - Angela has been an outstanding resource. We will desperately miss her and bother her on her personal email when she is not out traveling.
 - Bridget: I second what everyone has said. I couldn't ask for a better counterpart at DEC.
 - Oliver: DEC is already signing her up as a volunteer, others may have to get in line.
 - Meg: it has been such a pleasure working with you. LCBP has relied so heavily on you over the years. You always had a can-do attitude of tackling problems and communicating with the public on lake water quality issues. We hope you enjoy retirement.
 - Eric Perkins: I echo what others have said. At the Environmental Protection Agency (EPA) we have appreciated your contributions over the years. I remember before you started at DEC your work with the long-term monitoring program (LTMP). Your contributions to the area go back beyond your DEC role. We will miss you big time. Hopefully we'll meet up on occasion.
 - Jenn: You will be truly missed in our carpool and discussions. Enjoy your retirement.
 - Jamie: I'm also in the carpool. We will miss you. I've always been impressed, no matter the question, that you always had a measured, thoughtful, intelligent answer. We can always count on Angela to be thinking about questions with logical answers. I wish you well in retirement.
 - Leigh: Its always been a pleasure to listen to you at the table. I've learned a lot through listening to you.
 - Mark: I echo that as well. You are always very helpful. You will be missed.
 - Neil: In addition to everyone, and I'm dating myself as well, I remember filling bottles with you at the LTMP before joined DEC, working with you and Mary

Watson on a subsequent cyanobacteria project. You have made a really substantial career level contribution to the science and our understanding of issues in the Basin. You never fell into the chaos and always provided a balanced measured response. I've looked up to you and you are much appreciated. Thank you.

- Angela: I would have never guessed the opportunities that come my way since moving to VT. It's good to know that I appeared to know what I was talking about. VT is a small state passionate about water quality improvement.
- Neil: There is a Clean Water Board hearing on Oct. 22 to consider State fiscal year 2022 clean water budget proposals. See <https://dec.vermont.gov/water-investment/cwi/board>

LCBP Updates

- Meg provided an overview of the RFPs that are open: Enhanced BMPs, Pollution Prevention and Habitat Conservation, AIS Spread Prevention, CVNHP pre-proposals, and the Technical RFPP. Matt reviewed the priorities for the Technical RFPP that were approved by the Steering Committee.
- Meg: The NYS DEC Coordinator position is closed, interviews are ongoing. We expect results by the next TAC meeting.
- Mae Kate: We've received 2 scopes of work from DEI consultants and are working to determine our path forward. We began a project with a UVM research class on how to best accomplish outreach to marginalized communities in the basin about the Lake.
- Meg: Boat Launch Steward update - New York launches shut down their decontamination stations after Labor Day weekend. The Shelburne and South Hero decontamination stations will remain open until after Indigenous Peoples Day weekend. We are seeing lots of zebra mussels. We are hearing from boaters that many of them are wrapping up their season, but lots of people are considering a few final days on the water if the weather is warm.
- Meg: The CAC Coordinator position has been posted. This is the position that the Steering Committee approved, to have an individual help coordinate and collaborate with the New York and Vermont CACs, and liaise with the Québec CAC.
- Mae Kate: The IJC Public Meetings were held last week. There was a lot more participation from the public on the US side than there has been historically. Many questions focused around the potential to use wetland restoration to reduce flooding, which the Study has concluded is not a viable option. There will be a series of technical webinars following, and I will share those details with the TAC when they are finalized.

Review and approve meeting minutes from last TAC meeting

Motion: to approve the meeting minutes

Motion by: Margaret

Second: Angela

Discussion: None

Vote: All in favor

Abstentions: None

State of the Lake discussion

Lake Champlain beach closure graphic and data

- Matt: introduced the Beach Closure graphic and provided some context around the publishing of the SOL report. The beach closures graphic has been included for many years. We are considering altering this graphic and Lauren will provide the context.
- Lauren: reviewed the 2017-19 beach closure graphic. For the next State of the Lake report, if the graphic were to be re-created in this way, many beaches would not have a status available due to lack of data. It is becoming harder and harder to get data from beach managers. LCBP staff member Cynthia who has been collecting this data over the years said that there is a noticeable trend: that when beach closures increase the towns and states are becoming more reluctant to make the data available. For example:
 - Québec had stopped collecting and reporting cyanobacteria beach closure data some years back and all closures would be voluntary.
 - Starting in 2019, the Vermont State beaches switched to a new system of reporting where they don't keep track of where and when beaches close. They keep an available list of their weekly *E. coli* monitoring results only, but this doesn't show specific beach closure data.
 - To get additional information on New York State beaches we were told this year that we would need to fill out a "Freedom-of-Information" request.
- Lauren: LCBP Staff talked about this graphic. Based on the difficulty of gathering these data and how staff use the graphic with the public, Matt crafted a new plan for 2021.
- Matt: Beyond the data issue, the graphic is busy and we've received feedback that it might be trying to communicate too much at once. Staff came up with the idea to separate the messages into a few different pieces: beach locations, and why beaches close/how often they close. Focusing on why beaches close: our thought was to pull out a few popular "indicator" beaches and show a bit more info about closures.
- Matt reviewed the idea of barcode graphs.
- Angela: I like the ice out graph and think it's a powerful way convey that message. I'd be reluctant to call out individual beaches, because that could influence public opinion. Could we combine beaches by region instead and put n = x number of beaches for which we have data?
 - Lauren: we did choose this style of graphic because we don't have a lot of information on some beaches. Moving forward we could work to create that data and aggregate it by region.
 - Matt: There are two pieces we are thinking about in terms of this graphic, what can we do this time around and how we can work to create these data in the future. Aggregating beaches by region wouldn't be representative either because we don't have the data to do that.
- Lauren T: I like this concept. In the 2020 season, I was told that a lot of our beaches were not open at the beginning due to COVID. I don't know if that was actually the case or if we should separate out 2020 due to COVID.

- Lauren J.: We haven't started asking managers for 2020 data yet. Historically it's been difficult to know the cause of beach closures when related to staffing. In 2018 St. Albans beach closed for the rest of the season because they had a bloom that lasted a week. We are trying to select beaches where we know for sure that they were closed due to cyanobacteria or *E. coli*. Noting that 2020 is a weird year, beaches might have been closed. Matt: if there are dates where they were clearly closed due to COVID, we could indicate that differently.
- Lauren T: You said that New York beaches have changed the way they report closure data?
 - Lauren J.: New York State beaches said we needed to fill out a Freedom of Information Act request to get the closure data. Lauren T: Shoot me an email, I may be able to get those data. Lauren J.: Thank you. I feel like our contact list for corresponding about these data could be updated.
- Leigh: I'm concerned about our ability to get this information voluntarily, if a beach looks bad, they might not report. Also, in the 2018 map, a lot of the points indicating beach location aren't accurately located.
 - Matt: If you have specifics, we'd appreciate them. Leigh: I'll send you an email.
- Matt: we definitely need to consider not showing the beach in a fair light. Something to consider is that this isn't really the *state* of the Lake, it's our reaction to the state of the lake. We are also considering removing beach closures as an ecosystem indicator.
 - Lauren: I'll add that at least for the data from 2018-2020, no beach has closed often enough to flag it as a bad status. The takeaway would be that beaches are open more of the time. Matt: we have a high bar for the indicator status, for a beach to be indicated as 'good' it has to have had less than 5 closures over 3 years.
- Bridget: One note that could complicate the bar code graph, this year a couple Burlington beaches were closed for both cyanobacteria and *E. coli* at the same time. When you're talking about using the data for only some beaches, you'd be selecting from a dataset. Even if you had data for 10 instead of 30, you'd just select down to 5? How would those determinations be made?
 - Lauren: right now, we don't have good data for many beaches. I wish we had data for 30 or all of them, but the number we have is very small. We had trouble with towns reporting different numbers of closures than the State for the same beach, so those data are called into question. We want to think of the best way to showcase this information then ask beach managers to keep track in a way that would help us build the graphic we want. Bridget: so, this graph is showing all beaches that have good data? Lauren: We probably have to see what we get for 2020, it could change this list.
- Ryan D: I wanted to point out that my office regulates beaches in Clinton County (not DEC). I am copied on the state results, I can see what we have on file. In New York state, different beaches sample for *E. coli* at different frequencies.
 - Lauren: It's the same in Vermont and Québec.

- Mark: Someone mentioned a concern about painting a beach in a bad light. Have we gotten pushback from this graphic in the past? The graphic shows each beach individually and categorizes them by status.
 - Matt: I haven't heard anything about that. I'm not sure if the Resource Room staff has either.
 - Mark: It's hard to know how big a problem it is to "red flag" a beach. The bar code graphs may not look any worse than what we've done in the past, maybe we're overly concerned.
- Angela: It's surprising how many times the Lake and Ponds staffs are called to comment on water quality because of these kinds of graphics. I think there are subtle ways that these things do contribute information about the state of the Lake that are perhaps inaccurate. Something that shows that most of the time the beaches are in a great state is a message we want to get out there. It's interesting to think about the idea that this is not a measurement of the *state* of the lake, but for many people this is their only way to interpret the state of the lake since they lack scientific background.
- Andrew: Another idea, I wonder if you could just have a timeline of this. Y axis is % of beaches closed, most of the time it's zero. You could convey closures over time based on color scheme. That would convey the interannual variability in beach closures and frequency. You could show the number of beaches reporting data in each plot. That might be a more concise way to convey the message that closures are infrequent, and that even when one beach is closed others are open.
- Kevin: The display by individual beaches is overkill, the regional idea may be a better way.
- Neil: For the beaches where you thought you had more data; the online resource could provide a graphic for an individual beach. You could present the aggregation in the printed version.

Discussion on revising / adding / removing Ecosystem Indicators

- Matt introduced this topic and shared staff suggestions for edits.
- Mark: I'm a bit concerned to have a summer lake water temperature indicator. Where are the data coming from?
 - Matt: These are all suggestions. The first step is to ask what are the indicators that are important. The second step is how to evaluate. We might use LTMP data from July-Aug. The challenge is what we would be determining as 'good status'.
 - Mark: I'm not sure what indicator it should be associated with. I'm concerned that the variability would make it difficult to make sense of what is used for a graphic. I'll argue for a 5-year trend/avg. The amount of noise you will see will make it difficult to see trends.
 - Neil: if it is of interest, we can do a first draft to see options.
- Margaret: I like the idea of reformatting, though I have concerns on the first three Healthy Ecosystems indicators. I'm thinking about what we are looking for and what it means. I have no idea what 'fish health' means.

- Matt: For lake freeze over we have full closure in mind. The hard thing would be to put a value statement on it. Fish health is a placeholder as we recognized it wasn't in the last report.
- Tom: The indicators table shown seems to be intended to distinguish between lake segments, however a number of those criteria are generalized for the entire lake. Is it useful to show these data in this chart that has lake segments?
 - Matt: Good point. In the original table there are two indicators where the data trend is lake wise.
- Neil: If my memory serves, I believe that the aggregation of lake segments does not follow the TMDL segments. I'm wondering whether we would want to revisit the segmentation. As for the value judgements, there are a couple like winter lake freeze over where we can make a judgement call or find a way to describe it as is and we may want to think about how we do that. Most likely we can tell a better story if we don't lock into the concept of good versus bad.
 - Matt: this comes back to interpretation to and for the public.
- Leigh: Climate change needs to be a component of the graphic. The Adirondack Park Association (APA) uses LCBP information a lot when talking with the public. It seems in conversations that the public gets climate change a bit but not as it relates to aquatic ecosystems. Having this information is critical. I like getting rid of the biodiversity indicator and changing it to all invasive species. We should have an invasive species indicator and then call out water chestnut. We may want to provide an impact statement of invasive species influence on biodiversity. It seems like invasive water chestnut coverage is infestations.
 - Meg: Good idea. In thinking about where the indicators came from, we don't have comprehensive data to answer questions. Rather, we highlight impacts as they become available. Data that we do have long term has historically been wounding rates and water chestnut. Rethinking what we want to report on is a good idea but we have to balance that with what historical data we continue to collect.
- Angela: The goal of the indicators was to highlight things we felt were of concern. We had data that indicated a direction and then through management we had a potential to impact. However, data changes may be happening faster than anticipated. We should use data we routinely collect through management. Perspectives are changing in terms of what is important, which is not a bad thing, however whatever indicators we go with, we have to use for a minimum of 5 years. If we keep changing indicators people get confused on the important long-term things we are focusing on. If cyanobacteria blooms are not an indicator we want, we may want to use chlorophyll. What is the role of the indicator? Of what it's supposed to show? Lake water temperature is one that the public doesn't get yet, but lakes are warming and it is critical to show. Invasive species are tough. Water chestnut is one we focused on impacts, for some other invasive species there aren't enough data yet to evaluate the impact. Water chestnut provides a direct recreation impact on the lake. Tough call.

- Oliver Pierson: On Summer water temp., the record for June temps this summer seems worth of mention: <https://www.burlingtonfreepress.com/story/life/2020/06/22/lake-champlain-water-temperature-warms-june-record/3239183001/>
- Neil: It would be an interesting exercise to look at summer lake water temperatures.
- Andrew: Summer lake temperature also goes well with the winter ice graphic. A published report by Pete Isle's uses Burlington Vermont air temperature record for the monitoring period.
- Neil: I didn't hear any pushback on repackaging the indicators in the clean water and healthy ecosystem themes.

Workplan review: Conservation of the Lamoille River Mudpuppy (*Necturus maculosus*) Population Using Translocation and Monitoring (Mark Ferguson, Vermont Department of Fish and Wildlife)

- Mark Ferguson presented.
- Neil: When a lampricide treatment does not go forward because of low water, is that because of not being able to control the concentration of chemical in the river?
 - Mark F.: for low water, one of the concerns is pooling and poor mixing. In those conditions, you might end up with hot spots that would lead to more non-target kills.
- Mark M: This looks like an interesting study. You're moving these animals, there's currently no population there now?
 - Mark F: We don't have reports of mudpuppies upstream of the dam, but haven't done our own investigations. If other rivers are a good example, they generally aren't found above the primary fall line. Mark M: if there's already a population, pushing it above the carrying capacity wouldn't be great.
- Margaret: The minimum number you will collect is 50, but what's the maximum that could be taken without impacting the population downstream?
 - Mark F.: We thought about setting the maximum based on previous studies. They trapped a total of 161 over 2-year period, so we don't feel that would be problematic for the lower population. We really don't know at this point what the density is in the lower section. Our trap rate for the period we were after was a little over 7 times what was reported in that thesis. It appears that we still have a fair number of animals in there.
- Leigh: if they aren't able to complete the lampricide treatments one year, they might treat the next? If one treatment isn't able to be treated, do all treatments for that segment get postponed?
 - Mark: I don't have insights on how those decisions are made and don't know if they will be consistently done. There had been 1-year delays in the past.
 - Bill: I would have to get back to you after talking to Brad, some permitting details are very specific. In addition to low water, we are still working on the permit for the Lamoille treatment this fall. In the past I know they have treated in the spring if they were unable to treat in the fall. I don't know if they could do that on a system the size of the Lamoille. Rotation of treatment areas is important for a couple of reasons; it's meant to keep the population so that it's not producing

- adult out-migrants. We likely would not want to wait another 4-year period because that would allow for the production of adults. I can follow up if you'd like.
- Margaret: The most recent schedule has the Lamoille at the end of October. There have been other postponements this fall.
 - Oliver: The permits allow flexibility so dates can be adjusted if needed. The Lamoille treatment schedule is due to the ability to release water from dam upstream, that should be able to get the water levels to where they need to be.
 - Mark: Our original intent was to get this grant in place before the lampricide treatment on the Lamoille, so we wanted to keep that piece in place if the timing works out and it was still possible. We could be performing this rescue before the project starts, but in that case would share the results.
 - Bill: We are doing extensive radiotelemetry with salmon, I'm happy to share the information we have around fixed and mobile tracking. It can be difficult to quantitatively analyze the data. Considering trying to use the genetic information is another way to monitor changes in potentially genetic diversity, which is an indirect measure of population size. Bottlenecks associated with treatments could have a specific signature in the genetic analysis. Having snapshots associated with rescues and tagging would be really useful in terms of monitoring immediately and long-term.
 - Mark M.: I didn't see any discussion on the use of anesthesia for radio tagging. It can be a heavier lift than anticipated. If you do the alternative and move animals from the Poultney, are there concerns with genetic differences and potential issues?
 - Mark F: If we moved to the Poultney, the entire project would be moved there. We have existing genetic work within that basin and there are differences based on different locations.
 - Margaret: I'd like to see some additional clarity in workplan about if the project moves to the Poultney where the release site would be.

Motion: To approve the workplan as presented and address the questions raised by TAC members at the QAPP Stage (consider maximum number for relocation and clarify the Poultney relocation site)

Motion by: Mark M.

Second: Jen

Discussion: None

Vote: All in favor

Abstentions: Margaret

**1:00 PM Workplan review: Lake Champlain Basin of New York Dam Screening Tool
(Tracy Brown, Trout Unlimited)**

- Tracy Brown, Jacob Fetterman and Matt Mayfield presented.
- Neil: In the opening project description in the workplan, you talk about metrics for dam replacement versus removal or rehabilitation. What is the focus of this tool?
 - Tracy: dam removal.

- Neil: This project is about identifying dams and reconnecting aquatic habitat. It sounds like the workplan will involve culverts as well. Do you have plans to access and use full datasets for culvert work in New York? And is that taking on more than the project can pull off?
 - Tracy: if the data exist, we can add it as a layer to the tool. If the data are outside of an easily accessible database, we may not be able to. We can do some ground truthing for high priority dams to determine if they are in fact barriers.
 - Lauren: The majority of dam and culvert locations are in the Northeast Aquatic Connectivity (NAC) database. The person to contact would be Corbin Gosier. There has been substantial culvert data collection as Conservation Districts have received funding to do culvert assessment work in the NAC database.
- Leigh: Michelle Brown at The Nature Conservancy (TNC) has done a lot of work on culverts in the Adirondacks. In reference to Figure 2 in the workplan about the identification dams that have reservoir storage volume – I don't think there are a lot of natural lakes in the Adirondacks that have moderate dam reservoir levels. A lot of lakes have a natural elevation. I'm not sure how this would get incorporated into this project. At APA I use GIS and look at the hydrology layers and overlay 1890 US Topography maps and can see the dams installed afterwards and the level of impoundment for each dam. A good example is Lincoln Pond in Essex County.
- Neil: I wonder if there is a plan to identify unknown dams for this project. I'm comparing the numbers on the NY side (211) versus the VT side.
 - Matt M.: We believe that the NYS dataset is the best known, but considering your point we may be able to find dam locations. We don't have any remote sensing processes built into the workplan.
 - Tracy: The Hudson River Estuary Program was doing something similar, looking for those really small dams on private property.
- Matt V: A question I'd like to propose to the TAC is whether this project would benefit from having an advisory committee for the criteria, etc.
 - Neil: It seems like the NY-LCB Dam Task Force would be as good a group as any.
 - Tracy: We can build the advisory committee into the workplan.
- Bill Ardren: It will be great to have this tool in place. Something that may come up is the prioritization of a dam because of an opportunity. For example, the Saranac River is an issue with salmon passage and Indian Rapids Dam is directly upstream. We are working with Trout Unlimited folks to take the dam out with anticipation that a fish ladder will be installed on Imperial Dam, lower in the Saranac River. In some cases, dam prioritization will be situational. I'm wondering if in some cases it will be possible to incorporate unique information into decision processes within the tool.
 - Tracy: We have talked about that and it should be incorporated in some way. In another project we made the tool itself editable via a password protected log-in system. We had a notes category as well. It will be important to keep things updated periodically.

- Bill: The VT Dam Task force would be good forum to discuss this as well. I'd be happy to provide more information from USFWS office as we are involved in a lot of the passage work.

Motion: To approve the workplan with edits and edited based on the conversation

Motion by: Margaret

Second: Angela

Discussion: Neil is excited to move this project forward

Vote: all in favor

Abstentions: none

Workplan review: Rapid detection of Atlantic salmon and trout in the Boquet and Ausable Rivers using environmental DNA (*Brendan Wiltse and Carrienne Pershyn, Ausable River Association*)

- Brendan and Carrienne presented.
- Bill: I want to make sure you remember my offer to share genetic samples associated with the task of ground truthing the eDNA assay. We can talk offline.
- Mark: Good talk. If the stocking truck was upstream of your site prior to eDNA collection, the data are meaningless. Is there going to be some kind of coordination to avoid this complication with stocking?
 - Brendan: The water coming out of those tanks would have high concentrations of DNA. One of the roles of the project advisory committee will be to ensure that these factors are being coordinated so we don't have confounding factors during the sampling process.
 - Carrienne: Also, this is one of the reasons why we plan to meet with the project advisory committee immediately before the sampling season.
- Margaret: I had a similar comment about stocking. I am guessing that brown trout are both stocked and reproducing out there. I think coordinating with stocking is going to be critical, and I would encourage you to think more about the headwaters than the mainstem. How many times are you planning on visiting these locations to get a sense for temporal patterns?
 - Brendan: When we started this work in Otis Brook, we sampled 3 times a year to understand the temporal aspect. The signal can remain present in a stream up to about 3-weeks after fish are removed. This is an important consideration for data interpretation. In our current plan, mostly sites would be sampled just once. I could see us choosing to revisit sites at different times of year due to salmon spawning migration. We will get the input of the project advisory committee on this topic.
- Leigh: When I look at the map and see some of the tributaries that are being surveyed, 10 sampling points are shown in close proximity in some areas around the tributary. If you say DNA can last for several weeks, what's the value of sampling downstream in so many places. Is that a fair understanding?

- Brendan: In a lot of the streams that are the size of the mainstem, the sample spacing is derived from caged fish experiments looking at downstream DNA detection. If you remove a fish from a stream the DNA signal can persist. Because of this we use a 1 km sampling distance.
- Neil: The same answer would apply generally to electroshocking as well?
 - Brendan: We have a good probability of detecting a single fish within 1 km downstream of that fish. You could electro-fish 100 m of stream, find no brook trout, but get a positive with eDNA. Making the comparison of biomass estimates with electrofishing and eDNA, you would expect a lot of noise, but there are statistically significant relationships that have been established.
- Margaret: It appears that you forgot to include your references in the workplan, so those would be nice to add. In Fig.3, you talked about the movement of fish further upstream, so it would be helpful to show where fish have been stocked.

Motion: To approve the workplan, with the additions suggested by Margaret

Motion by: Bill

Second: Leigh Walrath

Discussion: None.

Vote: All in favor.

Abstentions: None.

Presentation and discussion on Champlain-Adirondack Biosphere Reserve (*Kelly Cerialo, Paul Smith's College*)

- Jim Brangan introduced the topic and the presenter, Kelly Cerialo.
- Neil: what is the one thing you would like the TAC to do to support your mission?
 - Kelly: We are looking to hire a coordinator. We are in a tough spot because we're run by a volunteer board. Spread the word that we live in a biosphere and that there are opportunities stemming from that, and let us know about any potential opportunities to secure funding to support a part time coordinator.
- Margaret: My concern with the biosphere is that people think of land use and forget about aquatic organisms.
 - Kelly: I realize that the words used are limiting. When talking about the biosphere in general and our specifically, the aquatics are incorporated. We are talking at headquarters on how to change the language. There's a lot of lobbying to do away with the word 'reserve'. We want to have a word that lets people know they can walk on the grass, but encourages them to be nice when they are walking on the grass. UNESCO has worked so hard to build recognition. We are worried that if we chose different names, it would be a loss for people. Everyone knows World Heritage areas.
 - Jim: as you can see from our sustainable development goals, 2 focus on water. As LCBP staff, I have always focused on water. We have a film crew coming up next week that was going to video stewards from the Adirondack Watershed

Institute and LCBP, but since the boat launch steward season has wrapped up, we are now focusing on salmon counts and the work being done in that realm.

- Jean-François: There is a biosphere reserve in the St. Lawrence river at the outlet of the Richelieu, I was wondering if you could link Lake Champlain to the St. Lawrence that way?
 - Jim: We are always interested in establishing new partnerships. Once border restrictions are lifted maybe we can sit down. We have some great biosphere reserve neighbors.
 - Kelly: We have traveled to that region quite a bit, I second that. We can start talking about ideas before the borders reopen. The Canadian biospheres serve as a really good model. The one thing that some of them have done very well is bringing indigenous voices to the table – putting together conferences and actively engaging these communities.