Reviewer Report on
Fish Passage Program Review

Reviewer #2

May 24, 2018

Background: NOAA convened an eight-person review panel in the spring of 2018 to conduct a program review of the agency's Fish Passage Program. It culminated in a three-day facilitated workshop in Silver Spring, MD that featured presentations by invited NOAA staff. Afterwards, each panelist was requested to submit an independent report that summarized the panelist's thoughts on the program. This is my report.

General Observations and Recommendations:

PROGRAM OBJECTIVE: The Fish Passage Program (FPP) has stated objectives. Objective 2 is: "By 2020, increase access to historic river rearing and spawning habitat for targeted diadromous fish species." With such an objective, NOAA can hang up a "Mission Accomplished!" banner and go home. It has accomplished that task. Clearly, the objective is inadequate because it fails to set any target levels of access. It is understood that the exact amount of habitat to which access will be increased is impossible to predict with any accuracy, yet it is unlikely that anyone will severely criticize NOAA if it falls short of its proposed target. However, failing to have *any* quantifiable amount in the objective invites cynicism. Some number should be provided, regardless of how soft that number is. One approach to providing a number would be to calculate the number of miles of stream that were reconnected during the last ten years through fish passage conditions in FERC re-licensings, document the number of FERC re-licensings that occurred during that time, calculate the average miles/year, and similarly document the number of stream miles that were reconnected per year through the Community-based Restoration Program (CRP) and use those figures to project the number of miles that may be reconnected during the next ten years. That figure need not be an exact duplication of that of the past ten years. If it is known that during the past ten years there were major projects that opened up unusually large number of miles (and no such projects are looming in the next ten years), if staff reductions or increases are anticipated, if CRP funding cuts or increases are anticipated, such factors can be taken into account when proposing this target number of miles for the objective during the next ten years.

METRICS: There was much discussion of the use of 'stream miles opened' as a key metric for the program and many felt that it is inadequate. I suggest that it is adequate and that alternative metrics are hard to define. 'Stream miles' implies that all miles of habitat are of equal value, whereas we know that's not true. Juvenile steelhead habitat is different than juvenile coho habitat. Furthermore, one mile of Whitford Brook in Connecticut does not have the same amount of habitat as one mile of the Susquehanna River in Pennsylvania. To get around that,

one might adapt 'habitat units'. For Atlantic Salmon, biologists have adopted 100 m^2 as one habitat unit and have inventoried streams in New England in units not stream miles, which helps distinguish large streams from small streams. But adopting this spatial measurement to all streams requires stream habitat inventories, which are likely lacking for most watersheds, nationwide. Furthermore, it requires parsing stream totals into subtotals for each species since the habitat for Atlantic Salmon is much different than that for Alewife. Even if such species distinctions were ignored and it was assumed that all of a watershed was suitable for some species (on the East Coast, American Eel), it would still require someone to measure all streams to come up with the number of units. At the end of the day, it seems stream miles is the best metric to use, recognizing that this is a surrogate for biological realities. While such a surrogate would not be acceptable for a scientific research (where precise measurements would be needed), it is acceptable for the stated purpose, which is a management activity.

I suggest four additional metrics for consideration:

(1) Number of miles of restored natural hydrograph (or natural flow regime). We focus on fish passage as the outcome of FERC relicensing but in the Northeast, often a major accomplishment by the Agencies is the termination of pond-and-release project operation and the conversion to instantaneous run-of-river operation. This is a huge accomplishment/improvement for which NOAA and others should spotlight and take credit. It may improve conditions downstream of the dam for many more miles of diadromous fish habitat than the fish passage condition has reconnected for upstream habitat. It also benefits aquatic taxa other than diadromous species. If there is a downstream dam, the miles counted would extend from the re-licensed dam to the downstream dam. If there is no downstream dam, the miles counted may extend all the way to tidewater, or to some intermediate point where staff has concluded the influence of the flow regime is no longer felt. I believe these data are easily calculated and compiled as a new consistent nationwide metric. Perhaps the only complication is that some western dams may always remain as pond-and-release due to their intent and therefore may not be comparable to an East Coast project that was converted to a true run-of-river. But if the FERC license results in great improvement of the flow regime (e.g. special releases for salmon migrations), it could be counted either as a modified national metric or a separate metric. One metric would be conversion to natural flow regime and another metric could be conversion to a more biologically beneficial flow regime. While most dam removals would also be credited with conversion to a natural flow regime, some cases may need further thought. In the case of the Klamath, if five mainstem dams are removed but there is still a headwater dam that altered flow for irrigation, the overall river flow is improved but still not natural.

(2) Number of sites where survival of downrunning migrants has been increased. This is not captured in any other metric but is a major accomplishment and should be documented. The work highlighted in the Willamette Falls presentation is a good example. Some threshold level of increased survival needs to be established. Would any increase (e.g. from 50% to 40%) qualify or would it be those projects that met NOAA standards (e.g. 95% survival)? Dam removals should also get credit under this metric. The removal of any dam that had turbines will

obviously improve survival but even in the absence of turbines, the removal of a 60 ft high fall or even the removal of a 10 fall for juvenile Alewives onto wet rocks is an increase in survival.

(3) Eel passage metric in the East- square miles of reconnected habitat. Eels cannot effectively use most fishways provided for anadromous fish and therefore require separate passage facilities. These were not constructed during circa 1970s – 1990s licensings/settlements. Now, as projects that already have anadromous fish passage are coming up for re-licensing, eel passage is being added and NOAA (or others) are not reporting these gains. American Eel can get over many dams but with difficulty. Our data show that density of resident eels plummet with each upstream dam. Eel passage greatly increases the number of eels in upstream habitat. Furthermore, eels can use the smallest of streams, swamps, roadside ditches, etc. and therefore the use of mainstem stream miles is not reflective of the true gain nor is the calculation of the true gain easily done. The recommended metric would be 'square miles of watershed to which access by American Eel has been improved'.

(4) Improved fish passage- Often there is a dam with a fishway that is passing fish but not effectively and not in large numbers. Some projects replace or modify such an under-performing fishway to gain superior performance or the entire dam is removed, which allow free passage for all species. Since fish were previously passing, it is not accurate to report that access to upstream habitat has been provided. That access may have been previously reported when the under-performing fishway was built. This requires a new metric: improved access to habitat. Counting the miles is easy. What is the threshold for improvement? A dam removal is easy—count all upstream stream miles immediately. An improved fishway is a bit trickier—what increment of improved performance is required to qualify? Is going from 50% passage to 80% sufficient to make the list? Do we have to wait for a three year evaluation study to determine if the improvement is real? Would we count the 50% to 80% miles now and if in 10 years when there are more modifications that take the fishway from 80% to 95% would we count it again? I suggest 'yes' to all. Any fishway improvement counts for this metric.

VISION: On the last day, there was considerable discussion about NOAA vision, or more specifically, where NOAA would like to take its program and what it would be like in 20 years. This was also directed at individuals. This struck me like the old job interview standard: "where do you see yourself in 20 years?" I find the conceptual a bit confusing or even irrelevant. Individuals re-invent themselves. Businesses evolve following different models and spin off. Agencies have a mission and the mission of the Hydropower Program is very clear, especially as it pertains to the FERC process. It is doing a good job of protecting fisheries resources and providing fish passage and that job will continue well into the future (beyond any of our lifetimes), regardless of the profitability of hydroelectrical generation. There is a huge workload looming and this program doesn't need mission creep. I always fear that new leadership wants to impress Capitol Hill with the latest and greatest concept and in order to fund the latest and greatest, they cut the budget for existing programs. The current Hydropower Program needs to be maintained and even strengthened, while addressing successional planning and perhaps eroding morale with diminished budgets and statutory changes to FERC rules. Updating the toolbox and perhaps policies and procedures (especially in light of changing FERC practices) is

always prudent but I would not welcome significant re-visioning of what the Hydropower Program does because someone is bored or thinks it's time to create a latest and greatest thing. What the program is doing should be considered a core function of the agency.

In the case of the CRP, the same thing could be said, but perhaps with less rigidity. The funding of community-based restoration activities is highly beneficial and should be continued but it is conceivable that the project could evolve with changing needs, economic and political realities, and budgets. How NOAA interacts with the universe of project managers could change, based on a new vision but I would argue against any planned radical changes currently.

CONSULTATION WITH OTHER DIVISIONS: It was unclear to what degree the fish passage programs consult/collaborate with the Science Center and Protected Resources Division. In watersheds with listed species, communication the Protected Resources seems inevitable and perhaps no additional procedural changes are called for. There was discussion that the Science Center should be brought in to assist with science-based objectives and evaluations and this deserves some consideration, particularly when there is a need to interpret program evaluations relative to fish passage. However, some of the regional science centers may not have particular expertise in fish passage and may not have much to offer. When evaluating the physical design of a fishway, engineers with the Hydropower Program are in a better position to lead those evaluations. When evaluating CRP-funded dam removals, the science center may be able to provide assistance, particularly in the case where the grant awardee is an NGO without science staff and not qualified to conduct a science-based evaluation. It must be remembered that both Protected Resources and the Science Center have their own missions are interests that are different from that of the FPP and the FFP must not let these other groups' interests supersede those of the FFP.

STAFF MANAGEMENT/SUCCESSION PLANNING: Staff continuity is an asset for the Hydropower Program. Hydroprojects have licensee companies with dedicated local staff, agencies have local staff and the issues associated with specific hydro projects have local flavors and attract the attention of local stakeholders. This creates a local "hydro community": the licensees, competing applicants, NOAA, USFWS, the State agency, the watershed groups, the angling groups, etc. Having the same people working in this community over years strengthens the sense of community, deepens the agency's understanding of the issues, allows the development of personal relationships, and allows staff to anticipate threats/opportunities on the horizon. Having staff regularly transfer in and out of regions disrupts all of these things and would constantly 're-set' NOAA as the 'new kid on the block', weakening the agency's impact. For example, in the past, the USFWS encouraged some senior staff to move around the country, military-style, to help develop their careers. While this may have advantages for some high level managers who are being groomed for positions in the national office, it would be very counterproductive for folks in the Hydropower Program and should not be encouraged capriciously. Having new staff arrive in the middle of long-term re-licensing procedures reinforces the image of NOAA staff as being out-of-touch federal bureaucrats from the Beltway and not understanding local sensibilities. The USFWS has used the longevity approach to great

benefit in its New England hydropower program. One example is that they've had one key person in Ecological Services working on FERC issues on the Connecticut River and western New England for over 30 years. About 15 years ago they hired another biologist to assist. She worked with the first fellow on the same projects but also worked independently. Two years ago, when it was clear the first fellow was going to retire in 2018, they hired a young biologist at an entry-level position. She has been training and being tested alongside the second person. The first fellow just retired after the end of a major relicensing and now the other two are just 'moving up', seamlessly, taking on the retiree's workload. This type of succession planning and local staff continuity should be mimicked by NOAA. This recommendation could be repeated under some of the Questions that follow below (esp. Watershed Approach) but it is important enough and relevant to most aspects of the two programs that it warrants inclusion here as an overarching recommendation. It is understood that NOAA doesn't expect additional resources in coming years but working with Human Resources, it is seems like innovative ways of bringing on entry level staff may be possible in an interim manner (interns?) when retirements are looming in the near future.

Several times the issues of personalities came up—we all know that difficult personalities in key positions can thwart best intentions of programs to develop partnerships and achieve objectives. I know of no examples of where difficult personalities within NOAA's FFP are currently causing problems but it may be advisable to occasionally reach out to partners in regions to get a feel for how NOAA staff are perceived. The USGS occasionally polls local partners about its researchers at labs to ensure that the researchers are working on questions that matter to local partners, engage constructively with local partners, and perform as effective team members. NOAA could do something similar with its regional staff—in both the Hydropower Program and CRP. This would not be as blunt as 'tell us if our staff are jerks'—but carefully worded anonymous questionnaires that provide feedback to the National office to determine how staff are perceived and if they work effectively as team members. State partners would be an important source of information as well as prominent NGOs and, in the case of Hydropower Program, the USFWS. This may not be as simple as saying that person X is a serious problem but it could reveal that person X is new and seems unsure of his agency's authority or role and NOAA could then arrange enhanced training or mentoring for this person in hopes that it can help guide the person's development and avoid becoming a problem. Collaboration between NOAA, USFWS, and the States is critical to succession in FERC procedures. I have nothing but good things to say about NOAA in my region but know that in other regions there has been considerable friction between the States and USFWS on FERC matters and NOAA should aspire to avoid this in its program.

PRIORITY RANKING OF STREAMS/DAMS: This has been the hot topic of the early 2000s. Everyone wants to make sure we're all working on the most important streams/dams. Most geographic areas now have at least one if not multiple priority rankings of dams and streams. Other agencies are now considering doing their own. For the love of God, stop! We have enough. (Caveat- in the Northeast, at least. I recognize that parts of the Pacific NW and Alaska may not have any, so if there is a desire to attempt one, fair enough.) But most eastern watersheds do not have a need for another basic list. What is needed is ground truthing by

local people who know the watersheds and towns. A Connecticut effort found that many dams on TNC's (excellent) NCAT priority list did not exist and many existing dams were not on the list. This is inevitable due to the need by GIS experts to use existing, but flawed, databases.
In considering the need for further rankings, it must be recognized that all the high priority dams/streams are already known, if not be federal employees in the Washington, D.C. area, at least by local people who have been working in their areas for decades. Most of the deficiencies in the existing priority lists involve lower priority sites. Further, we need lists to guide us for awarding grants but everyone will continue to operate on an opportunistic basis—working on the project that is ready, able, and willing instead of waiting around for the top priority dam to be ready. If anyone feels the need to fine tune prioritization lists, money should go to local Parties to ground truth high priority watersheds, mostly by walking the entire streams.

CONSULTATION WITH STATES: The role of State natural resource agencies was rarely referenced during the meeting. There were many times where this point could have been made but I will make it here, in a general sense. The capacity of State agencies to engage in either FERC relicensing (and issuing a Section 401 Water Quality Certificate) and the CRP process of identifying suitable fish passage projects and work with NGO sponsors varies greatly from state-to-state. In states where the State plays an active role in these programs, active and continual consultation with the State agency staff is absolutely essential. It is critically important that NOAA, the State, and the USFWS are all on the same page for FERC projects and it is important that the State guides or approves of the projects being considered for funding under CRP. In states where the State agency is not active in these matters, it is important that NOAA carry the weight but at least communicate to the State agency what their actions are. NOAA may be at odds with the State on FERC relicensing if the agency is muzzled by politics (and that is OK). If the State agency is not engaged in community-based projects, continued grant awards and encouragement by NOAA made eventually recruit the agency into doing more.

Key (specific) Findings and Recommendations (as reviewer has comments on)

- **Question 1: Our goal is to, "conserve habitat for managed fisheries and protected resources," and one of the strategies for achieving this goal is expanding available habitat type by "increasing access to historic riverine rearing and spawning habitat for targeted diadromous fish species." Where do you see us excelling in achieving this goal? What kinds of things could we be doing or doing more of to help us achieve this goal?**
    - Observations
        - Strengths
            1. NOAA has statutory authorities to pursue this goal via its FPP.
            2. NOAA has effectively exercised these authorities and in increasing degrees. Ten years ago, NOAA's activities in the Northeast were negligible. Now, the agency has a strong and positive presence there.

3. In some areas, partnering with State agencies that administer their own Section 401 WQC program is an asset to NOAA in achieving its goal.
4. In some areas, partnering with the USFWS is an asset to NOAA in achieving its goal, particularly when NOAA lacks the resources to intervene in every re-licensing that might affect trust species.
5. The presence of listed species strengthens the position of NOAA to prescribe fish passage and other fish-related conditions in licenses.
6. The presence of species managed under the Magnuson-Stevens Act strengthens the position of NOAA to prescribe fish passage and other fish-related conditions in licenses.
7. Many of the practices, including performance standards for fish passage, are developed at the regional basis to adapt to regional realities and needs.
8. The CRP has successfully empowered many groups nationwide to complete beneficial fish passage projects (fishways and dam removals) through an effective grants program.

- Challenges
  1. In some areas, State agencies do not administer their own Section 401 WQC program and/or may not take an active role in FERC relicensing. This could reduce the ability of NOAA to achieve its goal.
  2. Currently, the federal power act and authorities of FERC provide opportunities for NOAA to achieve its goal. However, there are bills being drafted in Congress that could severely limit those opportunities and those of the States.
  3. NOAA apparently does not have the resources to intervene in all re-licensings that could impact trust resources.
  4. Many of the practices, especially performance standards for fish passage, are developed at the regional basis resulting in no consistency across the country, region to region.
  5. Diminishing funding and shifting priorities has reduced the number of competitive projects for funding by CRP.

- <u>Recommendations to address issue</u>:

1. Staff in the regions must routinely and proactively consult with colleagues with the USFWS and State agencies to ensure consistent and compatible response to FERC procedures and re-licensings.
2. Such consultation should also include the identification of which projects NOAA should intervene in and which projects for which such intervention is less critical due to USFWS's ability to do so, in light of NOAA's inability to cover all projects.
3. The CRP grants program should insist on prior consultation between local RC staff (probably already done) and State agency staff on all community-based

project proposals to ensure the State agency supports the proposals and the facts in the proposals are accurate. Consultation should also occur when queuing up potential projects for future grant applications.

4. NOAA should consider the use of short-term field detail assignments in the regions for staff in the national office in Silver Spring in respect to the Hydropower Program. The regional staff have flexibility to conduct their program with a great deal of autonomy (which is not necessarily a bad thing) and it is essential that national office staff understand how that works so that (a) it can better oversee the work of the regional staff, (b) it can better understand the interactions of regional staff with local partners (see General Observations on page 4), and (c) it can assist with successional planning and understand emerging opportunities for watershed approaches.
5. In regards to adopting consistent performance standards for fishways, I recommend that NOAA explore such standards but tread gingerly. I believe that most standards in place have merit and were developed not only to reflect local needs but also in collaboration with local partners. Unilateral rejection of such standards in favor of standards sent down from high could be disruptive and cause resentment and reduced morale. If there is evidence that the standards in place are not adequate, then they should be modified but NOAA should be wary of making all standards consistent for the sake of consistency. Henry David Thoreau once said something to the effect of "consistency is the hobgoblin of a foolish mind". I don't know what that means but I jump at the chance to pretend I received a degree from Yale and quote Thoreau. Seriously, the standards that are appropriate for effectively passing American Shad over dams in the Penobscot or Connecticut rivers could be much different than the standards that are needed to effectively pass adult steelhead up the Sacramento or Rogue rivers.
6. In Connecticut, the State agency has established a Riverine Migratory Corridor workgroup that consists of State, federal, and private (e.g. NGO) partners working on fish passage issues. It meets 1-2 times a year to review projects, report on the status of each, share resources and ideas, and plan for the future. NOAA RC staff participate in this Connecticut RMC and should actively participate in other such state workgroups where they exist and where they do not exist, attempt to create them.
7. Reconsider criteria for awarding grants under the CRP. It appears CRP has made the decision to stop funding fishway projects, work mostly in priority watersheds, focus on large (expensive) projects, and (perhaps unstated) give preference to projects that benefit listed species. A paper in NAJFM stated that there were more benefits to the resource when funds were focused in a few concentrated areas as opposed to sprinkling them all over the region. This may be true when assessing the benefits to specific species, but it may fails to recognize large-scale, political and less tangible benefits. Focusing solely on listed species disregards the objective to reconnect habitat for *all* diadromous species (e.g. Magnuson-Stevens species). While Alewife can be

found in some large rivers, they are most often found in smaller streams, which may not be in priority watersheds. Furthermore, many of the strongest Alewife runs on the East Coast are not supported by past dam removals but fishways because of the existence of high quality spawning/nursery habitat upstream of the dam in the form of productive headponds (e.g. Damariscotta, Taunton, Sebasticook). We know dam removals are better for streams, in general, and many large fishways (e.g. Conowingo) do not work well. What is not recognized in this rush to anoint dam removal as the only viable reconnection strategy, is that small Alewife ladders work exceptionally well and that some very important streams for managed species possess dams that their owners refuse to remove and therefore fish restoration will require fishways—or nothing. A strict allegiance to this new policy of big, listed, priority watersheds, and exclusively dam removals takes so many important potential projects off the table, freezes out experienced partners with solid track records, ignores productive watersheds, would result in missing time-critical opportunities for projects, shrugs off willing dam owners, and inhibits NOAA from meeting its objectives. My recommendation would be to soften those selection criteria or waive those criteria for some percentage of the total amount of money available through the FFO (e.g. 20%).

8. Balance between implementation and evaluation. The CRP program exists to reconnect habitat, not to make notable contributions to the scientific literature. Such contributions via evaluation studies are laudable but secondary. The bulk of the resources of the CRP must be dedicated to reconnecting habitat and must not be diverted from their original intent. Evaluation is good but there are few cases where a dam removal has not immediately and permanently restored access to diadromous fish. Even a moderately-performing fishway at a previously barrier dam passes more fish than from before the fishway was built. The need for more evaluation is limited. The balance must be skewed toward implementation.
9. Staff asked for recommendations for reducing the risks of CRP project failure. There are no guarantees but I believe that the emphasis on projects supported by local technical experts, reliance on known technologies (dam removal or tried-and-true fishway designs vetted by agency engineers), and support of experienced applicants with proven track records are the best assurances for success.
10. Staff asked for recommendations on how to report cost-benefit ratios. This appears to be another way of asking about metrics. One obvious way is tracking the projects' score of how many dollars per mile of reconnected habitat the project represents. In the case of Alewife fishways, the number of dollars per acre of reconnected habitat. Another option is if the applicant has forecasted how many adult fish the project may support (e.g. 2,000 adult Alewife/acre of pond; 1 adult Atlantic Salmon/1,000 production units), use that as a denominator under dollars spent.

11. NOAA staff in the national office should work with staff on Capitol Hill to raise awareness of the impacts of proposed bills that would change the Federal Power Act and FERC's authorities and do what it can to guide legislation in a direction that would not weaken either the States' or NOAA's ability to protect and recover diadromous fish stocks. The agency's ability to closely monitor legislative activities puts it in a good position to advise State partners of pending threats/opportunities and these should be regularly communicated to State partners, which are less likely to know what is going on but has unique opportunities to communicate to its congressional delegation.

- **Question 2: How do we better integrate Hydropower regulatory requirements and timelines with voluntary habitat restoration opportunities into a strategy for addressing highest priority barriers?**

    - Observations
        - Strengths
            - The FERC re-licensing schedules are known
            - CRP receives all grant applications and knows their geographic setting.
            - CRP has the ability to reserve a sub-set of funds to be used solely in one watershed as either a separate FFO or as a selection criterion.
        - Challenges
            1. Determining if there is any strategic value in opening habitat upstream of a FERC dam prior to fish passage. Is the amount of habitat so minor (remember, these are community-based projects) that FERC doesn't care about the amount of habitat reconnected.

    - <u>Recommendations to address issue:</u>

      To the extent NOAA's wishes to integrate, it can do it during the ranking of the CRP grant proposals. The ranking system could add 10 points or more for any project that proposes to connect habitat in a watershed subject to a FERC relicensing fish passage prescription. The relicensing schedule is known, based on consultation with the Hydropower Program. I recommend that no special effort to integrate is made unless there is a recognized strategic value as communicated by the Hydropower Program staff from the region. Instead, rank projects based upon their specific benefit (habitat connected to existing fish runs). In most cases, this will penalize projects proposed for above barrier FERC dams and will favor projects that pass diadromous fish immediately, which seems appropriate.

- **Question 3: How do we better incorporate a "watershed" approach into high priority fish passage habitat restoration?**

- Observations
  - Strengths
  1. Watershed approach has the potential of maximizing benefits beyond one dam.
  2. Watershed approach can accelerate the pace of restoration/recovery by providing passage at dams not up for relicensing for many years.
  3. Watershed approach can develop partnerships that will benefit the resource in many ways in the future.
  - Challenges
    1. The approach is complex and expensive, by definition.
    2. Takes a lot of staff time.
    3. No guarantee of success.
    4. No tracking of settlement agreement conditions

- Recommendations to address issue:

  NOAA has been extremely successfully in using this approach and asking us how it can do it better is like a baseball player who just won the batting title asking how he can be a better hitter. You're doing it! To be able to offer suggestions, one would have to dive so much into fine details and ultimately risks telling the agency things it is already doing. It would be easier to tell NOAA how to do a better job of this if we were told of instances in the past in which NOAA missed opportunities for watershed approaches. Details of such failures would instruct recommendations. However, no such examples were offered. With the review over, this type of discussion should be implemented internally.
  I think this approach needs a new name. 'Watershed' does not convey the full meaning of the approach and the word means other things to other most people. Perhaps: Multi-site watershed approach? Multi-project approach? Multi-project Agreement Approach? Integrated multi-project Approach? IMPA?

  I think NOAA must rely on local staff to recognize opportunities for pursuing this approach. Local NOAA staff in consultation with local partners like States, USFWS, and NGOs. If NOAA does not feel its local staff is adequately trained to recognize such opportunities, it could consider training sessions led by staff who has participated in past watershed approaches (e.g. Penobscot, Klamath, etc.).

  The Hydropower Program should develop a tracking program for settlement agreement conditions to allow NOAA to ensure compliance and understand all agreement milestones.

- **Question 4: How can we better coordinate our Hydropower and Community-based Restoration projects to build momentum within a watershed to open and create more opportunities for accessible habitat?**

- Observations

This is very similar to Question 2.

  - Strengths
    1. Already good and adequate communication
    2. Local communities know when a FERC project is nearing relicensing and can ramp up excitement and projects without a lot of NOAA prompting. Community-based projects can apply for grants from CRP.
  - Challenges
    1. Determining if better coordination is needed.
    2. FERC is generally unimpressed by Community-Based projects
    3. FERC deals with large river habitat whereas Community-Based projects generally deal with smaller sites. Often these smaller sites (whether upstream or downstream of a FERC dam) don't block fish movement to the dam or free up enough habitat upstream of the dam to influence FERC decisions.

- Recommendations to address issue:

  None other than continue to work through the CRP program using information from Hydropower Program and judgment of regional CRP staff.

- **Question 5: How can we improve our strategy and structure for evaluating agency-wide fish passage program outcomes?**

  - Observations
    - Strengths
      1. There is a desire by NOAA to evaluate FPP outcomes.
    - Challenges
      1. One of the challenges of evaluation the outcomes is ensuring that evaluations truly focus on the objectives of the fish passage program and not more over-arching objectives of NOAA. Throughout much of the discussions, the recovery of listed species was referenced or at least implied (when discussing metrics). It must be emphasized that it is not the job of the fish passage program to recover or de-list listed species of fish. That is the job of the Protected Species Division and that job includes lots of other objectives in addition to reconnecting the runs to historical habitat. Fish passage is one tool in the toolbox for recovering species. Even if fish passage is effectively provided, there may be other factors that inhibit species recovery. Therefore, it is important not to evaluate the program based upon these other factors.

  - Recommendations to address issue:

1. Instruct all Hydropower Program staff (regional) to complete a short synopsis of each FERC relicensing / settlement agreement they participate in, soon after finalization. Such a synopsis should include a list of features/conditions that NOAA wanted in the new license and a list of features/conditions that were ultimately included in the new license. Given the results, staff should grade the outcome in some manner (A through F, 1 through 10, Excellent through poor). It should also include a summary of staff time and effort, and how the license conditions/features will help support recovery, de-listing, restoration, or enhancement of Trust species in accordance to any recovery or management plans. Every few years, all staff should convene in Silver Spring and present these synopses for discussion and the composite grades should be calculated and analyzed to determine if the outcomes of all these re-licensings were generally favorable and thus inferring program success.
2. Poll non-NOAA partners in all regions to get their assessment of the effectiveness of regional staff (see General Recommendation "Consultation with States" on page 5).
3. Consult with colleagues in the Protected Resources Division and Science Centers on the effectiveness of the FPP, mindful that their perspectives will not fully align with those of the FPP. It is not mandatory that the FPP meet all of the desires of the Protected Resources Division but its input could be helpful.
4. Convene another Review Panel in ten years and make this report available to the panel and task it with not only evaluating the FPP but also determining if the program followed up on recommendations and has made improvements since 2018.

- **Question 6: Within our program activities, what is the most effective balance for investing in implementation and monitoring and evaluation?**

  - Observations
    - Strengths
      1. CRP has a proven model for investing in implementation.
      2. CRP has a variety of different kinds of projects to pick and choose from when deciding which should include monitoring and evaluation.
      3. FERC requires licensees to shoulder responsibility for Monitoring and Evaluation of their projects.
    - Challenges
      1. Monitoring and evaluation of FERC projects by licensees must be checked for veracity by agency staff, before (setting conditions), during, and after.

2. CRP- There is much dissatisfaction by project sponsors about the evaluation requirement of fish passage projects (from several grant programs and permitters, e.g. ACOE).
3. Awards are often barely enough to cover implementation with no extra money for evaluation.
4. Sponsors must close out projects and get all invoices paid a short time after completions of projects, per contract with funder, leaving no funds or time left for evaluations.
5. Sponsors (e.g. NGOs) do not own the land and are not well suited for long-term management of the land. They build fishways and remove dams. When they are done with one project, they terminate their relationship with that property and begin working on their next projects. Only a few NGOs are proficient at this work and we should not slow them down but keep them moving on to more projects. Evaluation requirements tie them down to past projects with time commitments, funds that they don't have, and the need for technical skills they don't possess.
6. Volunteer monitors (e.g. undergraduates under the supervision of non-specialist professors at the closest college) are unreliable and often do a less than satisfying job.
7. There is some pressure from outside parties for heightened evaluation of CRP projects.

- Recommendations to address issue:

1. Hydropower Program- Monitoring and evaluation of FERC projects need to be funded by the licensees. However, Hydropower Program staff must be engaged in this effort and 'monitor' the monitoring/evaluation to ensure it is being conducted per the license conditions. This should be a priority since the benefits/impacts on a large river that has a FERC project can be significant. This is also where contributions by the Science Center can be helpful—making sure that work done by the licensee is scientifically valid—and it is recommended that this be explored.
2. The Science Centers may support diadromous fish management to differing degrees by regions. While they may focus on commercial marine fisheries and harvest control, they need to understand that diadromous fish are part of their charge as well. There may be basic science questions that need to be answered (e.g. influence of stream flow on the success of listed species of anadromous salmonids) that go beyond the responsibility of FERC licensees but the answers of which could inform Hydropower Program staff when trying to develop FERC license conditions. Such research should be part of the domain of the Science Centers.
3. The CRP objective is to provide fish passage, not to evaluate it. Evaluation is desirable but an adjunct. Monitoring never opened up miles of habitat.

Implementation is key. Someday, Congress may strike this line in the budget and this program could be terminated. NOAA's FFP should fund as much implementation as possible while the funds exist. Recommendation: the balance should greatly favor implementation and pursue monitoring and evaluation only when such monitoring and evaluation has the potential of expanding our knowledge and influence future management decisions and not merely tell us something that we already know.

4. CRP requirements to immediately document successful completion of project as designed is reasonable. Was the fishway installed according to plans, including slope and other geometry and location? Was the dam removal implemented as planned, including the configuration of the reconstructed channel, channel slope, and provision of rock weirs? This can be done by project sponsors and RC biologists and NOAA engineers in one week, not over three years.
5. Do not require sponsors to conduct long-term project evaluation such as number of fish passed in the next five years, guaranteed control of non-native plants for eight years, channel stability after five years.
6. Do not assume that all projects need monitoring and evaluation. Typical projects will likely perform just as others have performed and studying them one more time will not add to our knowledge or predictability of future projects. Atypical projects may be monitored and studied to further our knowledge but it is unlikely that results will be transferable to other projects.
7. There is this accepted mantra that monitoring and evaluation are essential and needs to be done more often, which I dispute. It sounds good to government watchdogs who want to ensure money is not being wasted but from a practical point of view, monitoring and evaluation of all projects is non-essential. How many times have diadromous fish failed to ascend a stream when a dam was removed? How many times have anadromous fish failed to ascend a small fishway (non-hydro) that was expertly designed and built as designed? How many times do we have to prove the facts that we know? Furthermore, don't saddle a fish passage project with the requirement to prove the targeted fish population increased in number post-implementation because there could be many reasons other than fish passage that the population hasn't increased.
8. Instead of requiring all projects to include evaluation, CRP should subsample projects and earmark only some of them for evaluation and monitoring. Priorities should include projects that are known to be proceeding in coming years so that three pre-implementation years can be studied as well as three post-implementation years. Most small community-based projects lack the ability to study the site prior to implementation and that greatly weakens the value of the evaluations.
9. Don't require the project sponsor (a non-science based NGO) to evaluate the projects as part of the implementation but issue an RFP to academics to study the earmarked projects using set aside funds. They're more qualified,

have many students to help and learn at the same time, could get theses out of the studies, tenured professors have the opportunity to carry out monitoring for years, and they are unbiased since they did not receive funds to do the implementation project.

10. The Science Center could guide and evaluate studies.
11. The balance referenced in the question should lean heavily toward implementation not evaluation. That is the objective of the CRP, which is a management program. It should be science-driven not but it is not scientific research.

- **Question 7: What are steps we can take to improve our outreach to ensure we are effectively communicating the importance of fish passage?**

    - Observations
        - Strengths
            1. NOAA has staff and resources at the national level (and regional level?) to address this need.
            2. NOAA has the bully pulpit of the federal government
        - Challenges
            1. A large percentage of the public doesn't understand or care about fish passage or thinks that it only pertains to salmon.
            2. For those who care, there's the risk of preaching to the choir.
            3. There is a need to preach to the choir.

    - <u>Recommendations to address issue</u>:

        1. Continue to spread out awards, geographically to ensure the message of fish passage and fish restoration is promoted in all coastal areas.
        2. Issue press releases for completed projects and for year-end accomplishment summaries, both locally where projects have been completed and nationwide to reach communities where projects were not completed but where there are dams.
        3. Take advantage of World Fish Migration Day, International Year of the Salmon, Earth Day, etc. to issue new releases.
        4. Participate in state and regional committees of stakeholders and partners considering fish passage projects.
        5. Recognize that successful projects 'prime the pump' for future projects. Fund small projects in areas where there have been no previous projects but where there are other potential projects that can be pursued if the local community can be motivated to support them.

Conclusions:

1. Both the Hydropower and the Community-based programs are successful and well-run programs that are national assets of which NOAA should be proud.
2. Both programs should be protected and strengthened.
3. Neither have fundamental flaws or systemic weaknesses that require fundamental changes.
4. While any program may be improved, I believe improvement for these programs will rely on continued recruitment and training of personnel, introspection and fine-tuning, and continued consultation with outside partners.
5. Staff appear to be enthusiastic and engaged. In times of tight budgets and anti-government sentiment, morale can sag. Attention to boosting and maintaining staff morale is important.