

Reviewer Report on Fish Passage Program

Reviewer #3

May 24, 2018

Background:

The Department of Energy is developing a Sustainability Pillar to “Ensure that hydropower’s contributions towards meeting the nation’s energy needs are consistent with the equally important objectives of environmental stewardship and responsible water use management”. By doing so, “environmental objectives are incorporated throughout the full hydropower facility lifecycle”. The definition of sustainability is to “maintain the overall value of hydropower to the nation through balancing environmental, social, and energy-related factors with the co-objective of responsible environmental stewardship”.

Fish passage and habitat restoration are key contributors to achieving this goal, particularly since many trust species are critically endangered or at minimum considered species of concern.

This review is being coordinated by the Office of Habitat Conservation (OHC), with support from the Habitat Enterprise. For the purpose of this review, the NOAA Fisheries fish passage program consists of activities managed by various national and regional offices within NOAA Fisheries whose purpose is to maintain or improve access for migrating fish that need to reach riverine habitats for various life stages. Specific NOAA programs included within this review are the Restoration Center’s Community-Based Restoration Program, which funds dam removals and other fish passage projects; and the Hydropower Program, which is coordinated by OHC’s Habitat Protection Division and is executed by the NMFS Regional Offices through review of and comment on FERC licenses under the Federal Power Act.

The purpose of this review is to obtain external input into the NOAA Fisheries fish passage programs – where they are doing well, and where they may we want to implement changes to improve upon program successes in increasing access to historical riverine rearing and spawning habitat for targeted diadromous fish species. This review will cover the mission/goal, prioritization, coordination, effectiveness, and external engagement of fish passage activities.

Overall key findings and recommendations

- 1) A number of tools are not being widely used that need to be adopted across the efforts. These include stream temperature modeling to understand where thermal refugia exist, linking this to habitat data and moving towards a system that recognize improvement of habitat in a quantitative sense. This will help the program achieve specific goals around the fish specifically.

- 2) More frequent updates of plans is needed, like what is done in the Southeast Hydro prioritization, and more reflection of how efforts are producing results. An example here was evaluation of how prioritization shifted how funding was allocated. It is important to maintain some flexibility in funding strategies because specific regions may become excluded (as they are not priorities) and then NOAA would have no successes in those locations to point to as successes or examples when they need them.
- 3) Standardized prescriptions that can be inserted as initial language, based on the 80% and 98% and 99.5% thresholds used in the Willamette example, but adjusted for the species and location.
- 4) A “field database” needs to be developed that tracks upcoming FERC projects, identifies staff time commitment, where USFWS will be involved and then identifies those that will need staff time that is not available. This database can be used to approach licensees and strongly recommend they fund the hiring of an ESA-focused consultant to provide early language modified for the species present into the draft settlement agreements, with triggers to ensure no projects fall through the cracks. There is precedent for this with DOT and ACE.
- 5) The field database can be merged with the CRP database that also flags early efforts. Together these can allow targeting of watersheds as “Action Watersheds”. These watersheds would be engaged earlier through a staff/consultant/facilitator to begin a watershed planning process. Then these can roll up into Priority watersheds as needed, when comprehensive plans are completed, towards achieving full barrier removal and passage to achieve core goals. This data can be used as part of a steering team made up of Fisheries Restoration Program headquarters staff with the division chief that looks ahead in a once per year evaluation of efforts towards identifying Action Watersheds on the horizon.
- 6) The Northwest Science Center has a watershed division that is a key contributor to advances in the region. This should be advanced in all the regions as part of the move towards Ecosystem-based Fisheries Management and supported through base funding in the Science Centers. The trust species are under the purview of NOAA Fisheries and it does not make any sense that this is not part of the Science Center mandate.
- 7) SMART objectives should be made part of a visioning process, and staff should take time to figure out where they want the programs to go in the future? Examples could include:
 - a. We will provide 100% access to freshwater habitat for migratory fish by the year 2150.
 - b. In the next 20 years, each region will achieve passage into essential habitat by trust species such that productivity is doubled.
 - c. In the next 5 years, we will implement habitat specific metrics to track internal goals and estimate habitat productivity.
- 8) From the SMART objectives, lead a structure decision-making framework to identify improvements to the objectives on 1-2 year periods allowing appropriate changes to capture needs and deficiencies (adaptive management).
- 9) Year-end money should be spent on high priority planning efforts, such as a consultant hire to enable watershed planning in a key watershed, or for monitoring efforts such as

10-year revisit and filling ongoing habitat data gaps such as monitoring stream temperatures or fish tagging.

General Observations and Recommendations:

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.”

There is a balance between regional and national program oversight, and the consistency and ability of regions to work with stakeholders and build partnership. Lack of consistency resulted a variety of approaches either focused on site, HUC8, HUC6, watershed scales and uneven applications of data and links to the science centers. Clearly the lack of sufficient resources constrains the ability of the programs in achieving their mandates, thus efforts to prioritize efforts are key.

Question 1(a): Where do you see us excelling in achieving this goal?

In terms of barriers removed, stream miles open and partnerships achieved, the programs have each delivered results and it is clear over the 3 days of presentations and conversations that the staff of NOAA have performed exceptionally and should be commended for what they have achieved to date. For all of the controversy the NOAA Fisheries and Protected Species programs gain for their missions which often regulate the catch rates of key species, these programs build trust among partners and should be commended for their work across the watersheds they have engaged. I was truly impressed by the number of projects they completed, given staffing and resource limitations.

Question 1(b): What kinds of things could we be doing or doing more of to help us achieve this goal?

I think there were elements of the regional programs that should be emulated, to the degree possible, at the other regions. Specifically those include:

- 1) Adoption of habitat and eventually production estimates for the target species in sites so that stream miles can be employed in a more realistic way, this could be done internally.
- 2) Reflection of how prioritization and watershed efforts shift resources and evaluation of whether this is excluding specific species
- 3) More recognition of other species, and I understand that there is need to concentrate on the Protected Resources, but this is only part of the charge. Specifically, as an example, if pacific lamprey are never considered, then because we know less and their panmictic population, they could be slowly lost from the coast as a whole while the much better known salmonids resources are protected heavily at the small scales their populations are understood.
- 4) The science centers are not uniformly employed throughout the nation, and it is clear that this stems in part from cultures and personalities, but also from the physical separation of offices. This is the first place where details or developmental assignments could be used in a targeted way to improve coordination and get more science into Hydro and CRP.

5) More details or developmental assignments between Hydro and CRP might lead to a better recognition of what each program is doing and how they could be more effective. This could also be employed across regions within the programs to avoid silos.

- **Observations**

Two programs are focused on the specific effort of reconnecting habitat; those are the Hydropower Program (Hydro) and Community-based Restoration Program (CRP). Each Region is unique, including the fish passage work in each Region, key species their fish passage programs focus on, key accomplishments, regional fish passage challenges, and where regions are likely to focus in the next 5-10 years given those challenges and opportunities. Metrics used are numbers of barriers removed, river miles, and performance of mitigation at FERC licensed dams.

Headquarters laid out the key challenge in hydro is that the timing of specific projects is not necessarily the same, or coordinated, in a watershed. The FERC relicensing schedule is set. This does offer long term planning ability however, and an ability to anticipate projects well in advance. Generally, Alaska is attempting to protect habitat, which later was also identified as an effort in the Pacific Northwest CRP, where the remaining lower 48 states are restoring trust species. Hydro is a regionally run program, but Headquarters offers the ability to coordinate consistency, and strategy, with a charge for sustainable energy development as defined by a DOE report. Adaptive management is attempted through settlement agreements and the ability to have a reservation, to reserve the authority to have a prescription after the license is granted. There is a re-opener possibility that is never used, that was later revealed to have been attempted 7 times with FERC rejecting or ignoring the request.

The CRP is nationally managed but used heavy involvement from regions to make grant decisions, and staff are often involved for quite some time before grants are awarded. It is important to recognize that the CRP also works on restoration of wetlands, shellfish and coral reef habitats, thus fish passage is only a part of their mandate. There is also a focus on sustainability, but it is hard to imagine that adaptive management (mentioned) is possible with very little monitoring being funded (only about 10-15% of funds). The intention is that the program cover feasibility, engineering, implementation and monitoring.

Alaska

Hydro program not aware of the CRP efforts in the state. Alaska seems to benefit from substantial high quality habitat, less degraded habitat, and this means that “river miles” might be an effective metric. Climate change is an on the ground reality. Unfortunately, 80% of FERC licensed projects never constructed, taking resources. Further, 50% of habitat is not even mapped, and the result is data poor situations that challenge staff to cover the state.

Southeast

Differences in mandates provided by Fish and Wildlife Act, Federal Power Act, Magnuson-Stevens Act and Endangered Species Act. This is challenged in the different states, with

different political realities. Hydro has adaptive management and monitoring are cornerstones of the FPA, difficult for NMFS to follow?

CRP is in infancy in this region, fish passage not a priority compared to marsh restoration. Effort in two programs based on geography, coordination but no joint planning. Other key players are the USFWS and Army Corps of Engineers (ACE).

GAR

Hydro. Dam Impact Analysis a nice link to the science center. Hydro focusses on identifying data gaps, monitoring, adaptive management and compliance. Negligible role pre-2002, became a significant leadership role in the post 2007 period. A focus on prioritization, many projects moving forward will be financially and technically challenging,

West Coast

Species limited to fall/spring in specific habitats many ESA listed species and populations. Most of this in the east has been eliminated and diluted through stocking. ESA drives almost everything. Including local prioritizing through recovery plans. CRP has engaged culverts and done physical (channel) monitoring.

Hydro operates through settlement agreements, and has completed 300+ agreements that include many partners. Success includes improving both upstream and downstream passage. CA has a lack of applicant and NGO support, many water supply and diversion issues that then include the ACE. Not enough capacity for all these issues. However, rooftop solar has changed the economics and allowed dam removal. There is much good habitat to justify action.

Incentives for partnerships included compliance, demonstrated success and promoting buy in.

■ Strengths

- 1) Incredible amount of work, given scarce resources
- 2) Ability to engage with partnerships is key, and is an important part of conservation and restoration
- 3) Recovery of listed species is a critical need

■ Challenges

- 1) The sheer enormity of the challenge.
- 2) Both programs are vital aspects of providing fish passage, but pretty narrow scope and not clear how they link to broader efforts
- 3) Heavily focusses efforts on only ESA listed species because those are the focus in Hydro relicensing

○ Recommendations to address issue

- 1) More cross NMFS coordination is likely needed since the organization is vertically structured throughout programs and offices. This can be confronted by reorganization (unlikely) or more details and developmental assignments across the programs and regions to cross fertilize
- 2) Work through visioning effort on consistency, integration, habitat definitions, and internal and external metrics of success

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**

GAR

Efforts focused on course-scale geologic priorities, using HUC6 and current available fish data for priority species and co-occurrence. Workshop and generally internal process, some external vetting produced a list of species based on whether there was an FMP, protected status, economic importance, public interest and if barriers were important to the species. Product resulted in all coastal watersheds being high or medium priority, scoring was heavily weighted by the co-occurrence of species, and this is not really factored into the scoring of grants. This left us wondering how valuable the exercise was.

West Coast (N CA)

Partner-led effort focused on counties (owners) and stream crossings. Collected physical data at barriers (many were culverts) and amount of upstream habitat. Used software to calculate based on fish diversity and potential benefit. Also factored in potential of project failure. Propelled hundreds of barrier removals and facilitation opportunities.

Chesapeake

Focused on diadromous and resident species with a specific focus on brook trout. Included hydrology and weightings. Developed by TNC but produced momentum captured and used by CRP effort. Helped facilitate partner support. Watershed planning helping to coalesce support and progress.

Southeast

Developed high-to-low rankings for hydro dams using species, feasibility, interest, process (in FERC or upcoming license review) and location information. These are then filed in management plans to FERC? Has helped with clarity for stakeholders. Shifted from stream miles as metric by assigning flow characteristics of reaches to species occurrence/preference (no sturgeon though). Great attempt to start breaking down stream miles into habitat units, a good starting point that can be refined with more data. This was possible due to a developmental assignment that helped with the tool. These examples demonstrated both barrier specific prioritization and watershed efforts. Biological data was form the recovery plans. I view this as a very good model.

Central Valley

Based on viable salmonid habitat available through a model output, uses physical data. Great application in data-rich setting.

■ **Strengths**

1) Effort to prioritize efforts of obvious importance to resource challenged staff

- 2) Southeast model of attempting to integrate habitat and the use of a developmental assignment (from science center?) to help in process

■ Challenges

- 1) Not enough reflection on efforts and was it valuable, where to go from here, etc.
- 2) If effort not valuable, then pulling of staff time not strategic
- 3) Prioritization appears to be shifting resources away from small projects due to likelihood of co-occurrence and more species of concern in large rivers, could limit important small project for one species from occurring
- 4) Prioritizations heavily focusses efforts on only ESA listed species

○ Recommendations to address issues

- 1) Time for reflection needed, formalize in a planning process.
- 2) Use SE as model from development of habitat prioritization using a developmental assignment to help
 - a. Start with basic framework that is flexible
 - b. Improve by filling data gaps with science center input
 - c. Try to incorporate data as it becomes available
 - d. Move to productivity-based frame work (number of fish vs stream miles)
- 3) Ensure that important small project for one species stay on the radar
- 4) Other species have value through non-ESA mechanisms, don't completely overlook them

Question 3: How do we better incorporate a “watershed” approach into high priority fish passage habitat restoration?

○ Observations

In an era where the adoption of an ecosystem approach is required, it is imperative to adopt a broad approach to restoration that achieves impacts for multiple species that pay ecosystem roles. Likely the best way to accomplish this is to employ a watershed scale approach in fish passage efforts.

Hydro

Introduced how settlement plans and comprehensive watershed management plans can foster achieving goals. Did not cover Recovery plans, which are heavily salmonid focused.

Comprehensive watershed management plans advantages are that they have no timeline and can be started anytime, do not involve negotiation and mediation and are easier for achieving adaptive management. However, they are often very general in terms of prescriptions and are time consuming. Settlements are binding and reduce risk and licensees can complicate specific with prescriptions and performance standards, but on a strict timeline, much give something in return, hard to do adaptive management because or need for certainty.

Klamath

Brought 45 parties to the table with values of enhanced recreational and commercial fisheries and cultural reconnections to the fish. All 5 mainstem dams to be removed. Third largest salmon river on west coast. Big win with large commitment, which was note “could not happen today”.

Yuba

Complicated with 11 projects with 50 dams and 400 million acre feet of water diversion. Despite gateway dam being obsolete, moving to reintroduction based on life cycle model and habitat productivity. Leadership from NMFS and a trust helped create a trust, salmon forum, and a \$100M commitment.

Santee Basin

Watershed has 66 dams with 31 FERC dams and diversion and re-diversion with the Cooper River. Challenges by recreational anglers liking an impoundment and issues with passage. Watershed plan finished by a consultant and resulted in the Santee Accord. NOAA leading a revision with a goal for guidance and coordination. Two teams, one focused on flow, water quality and habitat, and the other on passage, enhancement and monitoring. Attempting to fill data gaps. Energy companies (with resources) funded initial phase. This has brought public, private and others to the table but success was "personality driven".

CRP

Have about 5-6 years to spend money after awarded. Use a modified approach where multiple dams are considered at the same time. Use the value of the system (owner, community, and society), length of effort and site specific issues. The three P's partners, patience and priorities. Also politics (to bring money in, after flooding, etc.) and pilot projects to demonstrate success and what it looks like. Start early with partners and usually funded projects have been engaged early, so no surprises. Fund feasibility through monitoring in stages as the timeline of projects is often 10+ years.

Carpinteria Creek

Coastal watershed in Southern California with habitat for critically endangered Southern Steelhead and recognized as a Core 1 stream in the Southern Steelhead Recovery plan. Barriers were inventoried and prioritized through a collaborative stakeholder effort, and a watershed restoration plan was developed in 2001. SouthCoast Habitat Restoration was the lead partner. The CRP was not involved in initial prioritization and watershed plan development, but became involved when partners applied for funding the first barrier removal. The program provided partial funding for removal of 7 of the 10 barriers, and all were removed by 2016. Barriers were not removed in order upstream, and this is an example of how that order is not necessarily important. Driven by ESA listed species again, but great results.

Patapsco River

Empties into the Chesapeake Bay. Removal of the 4 mainstem dams opens 65 miles for herring and shad and 183 miles for eel. An initial 1993 passage structure did not function properly and the infrastructure was aging. Flooding and deaths at dam brought political will and spurred their eventual removals. Again, order was not in order of barriers upstream.

■ Strengths

1) Coordination in watersheds

- 2) NMFS both a leader and good partner in all the examples
- 3) Early coordination in CRP
- 4) Set timeline in Hydro

■ Challenges

- 1) Focus on large watersheds
- 2) Driven by FERC timelines.
- 3) Same project could not be pulled off today due to resource limitations (staff and money)
- 4) NOAA starting too late on these efforts
- 5) Very different triggers for each program, but both benefit from watershed effort and partnerships.
- 6) No P for happenstance

○ Recommendations to address issue

- 1) Needs to be communication of resource limitations to the Hill using the Klamath as an example system (where everyone and the salmon won).
- 2) Winning examples needs better communication to the public at large and augmenting on NOAAs role
- 3) Needs to be training of use of facilitators in more steps to make sure that personality driven efforts are successful
- 4) Need to have better coordination to identify opportunities earlier, once the watersheds to focus efforts on earlier are identified, then get ahead on the time consuming watersheds management plan side
- 5) Possibility is a P word for happenstance, so really 6 P's with politics and pilot successes
- 6) When using a watershed approach and comprehensive plan, the barrier order does not matter and by coordinating on this both programs can create incentives for each other in achieving passage or removal throughout the watershed.
- 7) Pilot success in the watershed can also motivate others to follow, so effective NOAA and partner outreach is key, this can pressure reluctant dam owners
- 8) Prioritization of barriers is not always helpful when applying watershed approach, and might impede larger success
- 9) By ensuring prescriptions with biological triggers in systems with FERC dams, leap frogging (out of order) barrier removal can stimulate conditions for Hydro licensees to assess passage
- 10) It is more important to have clear priorities and partnerships than a watershed approach, but a plan (watershed, recovery, settlement) is needed for that. I would use the word planning rather than the fuzzy watershed approach
- 11) Flexibility to take advantage of opportunities when the "constellation of personalities" align is critical to success in many situations, so making sure the NOAA has staff that can help in the alignment is very important. Leadership is a balance between leading and empowering partners; facilitation skills are key. Perhaps this is a training opportunity as part of a leadership program.

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

High-level overview of the coordination occurring between the Hydropower Program and the Community-based Restoration Program (CRP). This will include watersheds where our work is overlapping and non-overlapping; key opportunities, successes and challenges with coordinating between these two programs; and plans to foster coordination going forward.

It seems that the coordination between the two programs lies in success of efforts in improving access to critical habitat. In a best-case scenario, Hydro would achieve passage at mainstem gateway dams and the CRP would tackle smaller tributary improvements, in general. Either this can operate in an uncoordinated way or through a watershed/settlement or recovery plan, that allows targeted improvements across the landscape.

Four regions and Headquarters provided overview of their coordination and that it is challenged by different mandates, organizational structure, geography of projects, boundaries of authority and scales of effort of the programs

It is difficult to see how these two programs could coordinate with one regionally and the other nationally managed and coordinated. However, in situations of shared geography and expertise gaps, there are opportunities. It seems identifying those could be the lowest hanging fruit. Since both programs need substantial investment in the process of building partnerships, and those partners need not be the same group, this challenges the effective use of staff time. However, for planning at the watershed level, there is a need to “get ahead” of the planning needed for watershed approaches, and to avoid holdup once the effort has advanced. Thus far, coordination is opportunistic, driven by watershed, settlement, recovery plans that include partnerships outside NOAA. Thus, it appears that early coordination facilitated by NOAA that helps coordination of watershed plans in locations that do not have one would be a valuable step. This could be accomplished by an internal detail or developmental assignment, or by a consultant/facilitator brought in on a contract. There is also a lack of coordination at the point of monitoring, and this can be coordinated by a watershed plan.

■ **Strengths**

- 1) Effort to prioritize efforts of obvious importance to resource challenged staff
- 2) Southeast model of attempting to integrate habitat and the use of a developmental assignment (from science center?) to help in process

■ **Challenges**

- 1) Not enough reflection on efforts and was it valuable, where to go from here, etc.
- 2) If effort not valuable, then pulling of staff time not strategic
- 3) Prioritization appears to be shifting resources away from small projects due to likelihood of co-occurrence and more species of concern in large rivers, could limit important small project for one species from occurring
- 4) Prioritizations heavily focuses efforts on only ESA listed species

- **Recommendations to address issue**

- 1) Encourage early coordination by facilitating watershed plan development in locations that are “on the horizon”. Perhaps call them Action Watersheds, and develop an action plan that can stimulate the local stakeholders to work on a comprehensive plan. These will help catalyze NOAA orientation and coordination within the watershed.
- 2) To break the siloed reality of the two programs there needs to be alignment of the programs at the appropriate level. A steering team made up of Fisheries Restoration Program headquarters staff with the division chief that looks ahead in a once per year evaluation of efforts towards identifying the Action Watersheds on the horizon.

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

- **Observations**

Called effectiveness monitoring. Currently both programs employ decent tracking metrics but do not directly link to outcome goals towards identifying effectiveness.

Hydro

No standard, but often survival, passage efficiency, passage rate. Each of these are ok, but a singular value for each makes it hard to track progress in some circumstances and may not mean anything in the absence of the others. A simple example is that a high passage rate means nothing if all the fish die moving downstream. Licensees are responsible for the decision to go ahead, any prescriptions in settlements are regulated and enforced by FERC. Monitoring is key because performance cannot be measured against the settlement requirements without it. Problems has been that the numbers do not often relate to overall success, account for improvements on past efforts such that they are hard to document without “double dipping” and do not account for upstream and downstream passage.

CRP

Currently uses “stream miles” opened, barriers removed and project completed. Program goals center on production and abundance as well as sediment movement as it relates to habitat. Provides a way of balancing implementation, monitoring and evaluation. Thus far, as in hydro, there is no standard and efforts have been at project level, individualized and opportunistic. During Open Rivers Initiative, the Science Center helped develop Tier I and II monitoring implementation effectiveness. Tier I monitored for structural changes and species presence, while Tier II was in depth physical, biological and socio-economic data. This was expanded to all the CRP as a consistent framework to allow cost effective monitoring and evaluation of performance. Currently Tier I is broken into physical, biological and socio-economic factors, and Tier II adds temporal and spatial changes in fish abundance, and in-stream changes in channel geomorphology.

Challenges identified were issues around coordination and project management within the funding timelines, data collection and retrieval, ensuring project partners provide data in public

access format. However, this is needed to show success, contribute to the science and allow self-evaluation.

Penobscot

FERC requires safe, timely and effective passage. This has led to no standard methods and I would guess, although no Hydro stakeholders spoke, difficulty in anticipating what the expectations will be in each settlement.

Patapsco and Merrimack Village Dam Monitoring

Looking to monitor sediment dynamics after dam removals, towards understanding channel stabilization and sediment movements that affect habitat and human uses. Channel stabilization and incision was quick and under low flow, which defied the expectations and indicated transient impacts of dam removal. While in hindsight this made sense, it was a new finding and this would not have been possible without monitoring.

CRP California Recolonization Monitoring

Evaluation of recolonization after barrier removal using adult surveys, juvenile trapping and pit/tagging studies. Pre and post monitoring done with Recovery Plans as the driver and focus on Coho, chinook and steelhead. Created the expected densities of adult fish given the levels for de-listing, down listing and depensation thresholds. Very nicely thought out application of data towards identifying goals for program effectiveness evaluation.

Battle Creek Diversion

FERC project monitoring adult escapement in a section that will have water flows reduced in such a way that mimics the changing Alaska climate. I hope stream temperatures are being monitored at a number of locations. This project was poorly tracked with an unknown commitment after a retirement. Speaks to the need of central tracking of projects.

Roanoke Rapids

Prescription for restoration was initially a truck and transport effort, which (as it is usually the case) did not function as intended. I personally do not view truck and transport as restoration and would advise against it. Good example of how monitoring it allowed the recognition of the failure of the system and halting of the program. Eels are still being moved about, but some concerns remain about the downstream part of their life cycle.

Pacific NW

Again to the Willamette, which makes me worry we are missing some failures out there. Small project where the prescription set survival thresholds for downstream movements of fish that triggered specific actions. If smolt survival was 99.5% or greater, no action was required. However, smolt survival was at least 98% (but < 99.5%); "additional work to lessen mortality" was required. If smolt survival was < 98%, "major operation and structural changes were required. If smolt survival remained < 98%, all options including criteria screens are on the table. They used experimental releases to experimentally test these numbers. I really think this is a great approach and it worked very well in this setting. However, it was also clear that the

uniqueness of the setting influenced the results, particularly the size of the project and consistent flow in a confined area. Implementation of same approach in other areas will be challenging.

■ Strengths

- 1) Stream miles is better than nothing
- 2) Recognition that these metrics are insufficient
- 3) A few examples, where data was available, where the habitat was being used more directly.
- 4) Tier I and II approaches are a nice tiered system
- 5) Many flexible definitions and approaches that allow teams to go in different directions
- 6) The appropriate vision and monitoring framework with adaptive management triggers can create a shared incentive for success

■ Challenges

- 1) No learning happening across the programs
- 2) No adaptive management occurring with a path towards inputting habitat into decisions
- 3) No SMART objectives, this limits the ability to evaluate progress
- 4) Flexible definition not always used to gain the best prescription, although that seems to be getting better
- 5) All the approaches meant that consistency was lacking and it seems every project is starting from scratch

○ Recommendations to address issue

- 1) Database fields to capture institutional learning, what habitat measures are being made
- 2) Start by using “miles of habitat improved”, “miles of habitat connected” in addition to “#stream miles”
- 3) Begin to move towards the amount of habitat and the expected productivity gained from this, and eventually develop frameworks for increased numbers of fish by certain actions
- 4) Database fields for habitat efforts, methods used, link to location of detailed documents, efforts to synthesize efforts are an obvious Science Center role.
- 5) Link data collection to data needs, so gaps are filled. Collect temperature and fine scale habitat surveys, growth rates, and feed into a GIS effort with local partners. Use the science center of post-docs to analyze data, produce restoration science that can inform best practices.
- 6) You cannot just focus on one life cycle. For example, the trucking of fish above a barrier only works if the offspring survive, or the adults survive for eels, during downstream movements. I am glad the Dam Impact Analysis in the Penobscot and Connecticut Rivers has identified the downstream side as the critical piece. Well overdue. However, this is what happens without monitoring, agencies get tunnel vision based on metrics with no bearing on the recovery of a population. Any number used as a metric should eventually be evaluated within the framework of a full life cycle for each species.
- 7) Identify consistent language for the following, as appropriate
 - a. A vision for each program and combined effort

- b. Initial submission to drafts for settlements, including multi-tier triggers that are appropriate for the species life history

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

○ **Observations**

Observations are captured above, as are most of the strengths and challenges.

Effectiveness is now a perceived weakness in the program, as noted the Hill is asking.

■ **Strengths**

- 1) This is being considered as important, the balance is hard.
- 2) Current monitoring has been helpful

■ **Challenges**

- 1) Where data was collected, the outcome changed prioritization and planning. This indicates that in cases where data is not collected, that the outcome is likely less than optimal.
- 2) The current 10-15% is not enough, but resources are challenged
- 3) Data management is key here, so that information can be employed to advance the science

○ **Recommendations to address issue**

- 1) Fund post-award revisits (do not have to be huge awards) that complete 10 year evaluation of projects, these could include how happy stakeholders and community members are, how happy licensees are, etc.
- 2) CRP projects are funded in phases and each has reporting requirements, but it would be good to have a more streamlined process where one award would fold into the next reducing the complicated nature of reporting
- 3) EVERY time there was monitoring, the programs learned something. There is no way to evaluate sustainability, effectiveness and contribute to the science of restoration without data. You will hear that monitoring is too costly, and that just getting passage and removal is best bang for your buck, but the evidence that was presented runs counter to that.
- 4) I believe this is already being done, but ensure there are both a monitoring plan and data management plan in proposal. This is a great place for NGOs and academia to be involved, as these short time frame projects seem to fit those entities. Then the data can be collected and in the project database can be linked to.
- 5) Many of data repository examples, no need to reinvent the wheel

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

○ Observations

Generally, partnerships appear to be developed well, so the programs should work through those to identify appropriate outreach activities. I see outreach as mostly an on-the-ground effort, but we also heard about the efforts through the Office of Habitat Conservation at the headquarters level. Unfortunately, what I heard was we work with “list of all like-minded agencies and NGOs”.

The example from Hydro demonstrated a win-win effort using facilitators to record a record and build a partnership of over 300 stakeholders. Collaboration is needed to be successful. Developing a culture that is facilitatory and with emotional intelligence

■ Strengths

- 1) Already an large group of active partnerships
- 2) Heavy use of facilitators and empowering of staff to be the point of contact for partners.

■ Challenges

- 1) NOAA Fisheries has a bad reputation in some regions
- 2) Only small number of partners were engaged properly and contributed to the conversation at the review. No licensees, no PRD or FERC staff. That limits anything I can recommend.
- 3) Demonstrated how other species benefit, but since that is not a mandate, not part of any prioritization and not evaluated or considered in any metric, it is not a truthful statement. There is no effort to benefit species other than trust species, and that is the mission, so leave it at that.
- 4) The direct line between staff and partners does mean that issues with staff could be toxic to efforts, and junior staff could be thrown into the fire (and were).

○ Recommendations to address issue

- 1) Diversify the list of groups you are reaching out to, include FERC and ACE, tribes and those that are less “like-minded”. I only mention this because the list provided in the meeting included only like-minded agencies and NGOs.
- 2) Kristen Ferry, Massachusetts Division of Ecological Restoration, commented that the CRP should formally requested feedback from partners, stakeholders, and grantees about how CRP outreach could be improved (for example, a survey or needs assessment). Has CRP identified what partners and stakeholders actually need and want outreach and engagement? Identifying these needs would be helpful for designing useful tools and approaches in the future. I agree with this recommendation.
- 3) Do better at demonstrating wins and try to separate the habitat conservation division from the PRD and Sustainable Fisheries groups which tend to be viewed more negatively, talk up the community efforts and partnership building
- 4) Do not say “strengthened by partnerships” as was on one of the slides, tell the truth: **“success of these programs is impossible without partnerships”**
- 5) Leadership and facilitator training

6) Set up succession plans and ease folks into new roles

Last thoughts and out of place ideas

Develop a “social responsibility” for those with power to restore or block migratory fish

Use “missing me” with migratory fish on posters to inform places with blocked access what they are missing

Develop visioning, and there is a different version needed for the internal and external components

Ensure the targeting of small projects is not lost, since those could pay dividends down the road.

Conclusions:

I believe this review could have benefited from having some questions provided from staff on things they needed, but that we were not prepared to answer in the given timeline. Still, I hope this review is of help and look forward to seeing what is done. Thank you for the opportunity to be a part of the panel, I learned a lot.