

**PENOBSCOT RIVER SCIENCE FORUM**  
**Oct 19-20, 2004**

Summary Points – Day One

- There are significant data gaps and opportunities for research
- There is a need for monitoring and an excellent opportunity to set up pre-post studies and long-term monitoring programs.
- There is a need for coordination, collaboration, and integration.
- We should take advantage of similarities and communalities with other dam removal projects while recognizing the unique aspects of each project and river system.
- Expect the unexpected and prepare
- Adaptive management works best
- Think outside the box
- There is a need for significant resources therefore: set priorities, leverage opportunities, and work collaboratively
- Dissemination, technology transfer, and community involvement are key

# Summary Notes For PRRP Science Forum Breakout Session #1 – “Penobscot Fisheries” Group

(compiled by Clem Fay, Penobscot Nation DNR)

Final Draft November 10, 2004

## Group Participants

Clem Fay, PIN-DNR (Facilitator)  
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Bob Goldstein, USGS  
Joan Trial, Maine ASC

We began the session using the suggested questions. The response on Question 1 (“How does PRRP affect your research?”) was “Not all of us are involved in “research””. The group determined that this question was low priority. I then decided to read off all seven questions and see what the group wanted to do. We decided to focus first on Questions 2, 4, and 5 in combination and ended up spending the rest of our time on those, although some of the studies and issues we discussed also likely have bearing on Question 3 (studies required for removal and bypass permitting needs). We never reached Questions 6 or 7 in the time allotted.

Questions 2, 4, and 5 were as follows:

Q2: What are the research priorities for this topic area?

Q4: What studies, investigations, analyses would we (forum participants) like to see in connection with the PRRP?

Q5: What ongoing studies and research programs need to be coordinated with or modified to reflect the PRRP?

The input began with identification of a few specific/priority fish/ecological interaction issues that would need study at the field level, where possible before implementation (i.e. in other systems where the biological components that would be restored are already in place), and certainly during/after implementation. Examples ranged from broad in scope such as the ecological changes (and their ultimate impact on established fish populations) resulting from re-establishment of historical nutrient cycling processes between the freshwater and oceanic environments, to moderately specific issues such as predator-prey and competition issues between freshwater stages of alewives and larval and young-of-the-year (YOY) stages of smallmouth bass. One member raised a very specific issue within this context, which was the potential for sub-adult or adult bass in a given waterbody to shift their diet from one including a significant level of cannibalism on YOY, where other forage resources are not abundant, to one including a reduced level of cannibalism when, for example, an abundance of juvenile alewives is present. This could then lead to diminished “self-regulation” of YOY population abundance, permitting more YOY (and perhaps yearling and older juveniles) bass to survive than would be ideal from a growth rate standpoint, and leading to a stunted adult population (e.g.) down the road.

It was agreed that, in general, the focus for identifying and monitoring these “priority” fishery management objective impacts would be lake systems where alewives become re-introduced, in contrast to alewives, shad or other species becoming re-established in the riverine segments.

Monitoring broader ecological changes that could affect existing fisheries ecology or management in the lower river reach (i.e. where direct changes in local physical and chemical attributes would occur), in upriver riverine segments, and in tributary lakes were also cited as important, with the highest concern being potential changes in the larger, coldwater, oligotrophic lakes in the watershed.

The group identified the need for more information on passage capabilities and movement dynamics of potential exotic resident and native resident species, so that the ecological and economic tradeoffs of increased connectivity among native resident species (e.g. white sucker, native cyprinids), perceived as a general ecological benefit, could be weighed against the detrimental effects of possible increased movements and accessibility of exotics. A couple of examples of specific questions along these lines would be:

Would northern pike or largemouth bass be able to use the Howland bypass to access the Piscataquis sub-drainage?

Would removal of lower river dams allow exotics potentially present in that zone of the watershed, such as black crappie and largemouth bass, to expand quicker and further than if the dams remained with conventional fish passages?

It was pointed out that, assuming the new Milford fish lift facility could be operated in continuous “fail-safe” mode with respect to “holding” and identifying new arrivals until agreed-to disposition procedures could be implemented by personnel authorized to do so, then this would provide a mechanism for rigorous, if not exclusive, control of exotics potentially spreading from the “restored” zone below Milford Dam into upriver zones.

Finally, there was brief discussion on the need to identify (possibly via GIS-based modeling of landform and elevation) and agree on locations of natural barriers to upstream fish migration (which could differ pending the species being considered), so as to be able to put some initial bounds on the geographic scope of potential re-colonization dynamics by diadromous species.

This first segment of discussion led to two of the four summary points that were presented to the larger group at the Forum.

1. The need for a comprehensive identification of all the issues of potential concern with respect to new interactions between re-introduced diadromous species and established resident species (i.e. we feel we only scratched the surface with our initial examples), followed by a literature and database search relevant to those issues, with the latter leading to a “metadata” catalog that would list basic dataset aspects (originating agency, data format, contact and access info, etc.) and, where possible, further annotate (i.e. temporal and spatial aspect of each dataset, methodology and associated limitations, other caveats to application of that data for pre-implementation baselines, etc.) each data resource identified. Once this is completed, remaining pre-implementation data gaps (i.e. other than those already identified above and under item 2 below) could more easily be determined and plans and time schedules for follow up could then be established. It was agreed that initiating this sequence of tasks and reaching the “remaining data gaps” stage of the process as soon as possible was essential to any productive long-term collaborative effort to monitor post-implementation fisheries and aquatic ecosystem changes.
2. We need, and likely don’t have, sufficient baseline fish population and ecology data from the lower river zone where direct physical changes in habitat would occur, from potential lake systems where alewife re-introduction would be targeted, and from appropriate “reference” or control sites for both. This was thought to be especially true for “non-game”, but ecologically important, species that have received less attention to date by most agencies authorized to manage the fisheries resources in these systems. Finally, the group agreed that, where such needs have been or can be specifically identified and agreed to prior to completing the more comprehensive “search”

tasks described in item 1 above, efforts to collect such data could and should begin immediately, rather than waiting for completion of item 1.

There followed considerable discussion on the predictive assessment and computer modeling side of fisheries and ecological issues associated with the PRRP. Some, but not all of this discussion stemmed from material presented at the forum, and/or elsewhere previously, of gross numbers of diadromous species “expected” to be restored through the PRRP, or for which the “potential” would be there.

As group summary point #3, we determined that we needed an assessment (or more rigorous assessment than previously, as the case may be) of:

- a. The modeling and/or other mathematical basis for current projections of diadromous species restoration numbers, where such have been projected.
- b. The availability and applicability of other models or methods to determine species that have already been projected.
- c. The availability and applicability of models or methods for other species whose restoration potential has yet to be projected.
- d. The availability and applicability of models or methods at the fish community or aquatic community level (esp as related to issues such as enhanced nutrient cycling and new predator-prey or competitive relationships that could develop with the project).
- e. For all of “a” through “d” above, if the model or method is based on data or other inputs from systems other than the Penobscot River, we need to identify the scope and nature of differences between the Penobscot and the outside systems that could bias application of the model. And, based on such differences, should/can the existing outside model(s) be refined prior to application to the Penobscot system?
- f. The need to develop new restoration projection models or methods at either the fish species or aquatic community level restoration projections where none may exist today.
- g. The need to include well-defined spatial and temporal contexts (i.e. how far and how fast) of fisheries restoration potential, under both natural colonization and targeted initiative (i.e. trucking alewives to a specific lake) approaches, in any modeling efforts.
- h. The need to consider human exploitation (e.g. commercial, recreational, and/or subsistence harvest) in any numerical modeling efforts, once rebuilding runs reach levels that would permit such harvest.

Finally, the last major summary point developed by the group was the need to research and characterize current human socio-economic aspects of existing fisheries (commercial, recreational, tribal sustenance; both River and GOM), identify changes in these aspects that could result from the PRRP, and incorporate these findings into fish restoration modeling efforts where appropriate. In particular, the GOM component was identified as high priority in this effort.

# ***Penobscot River Science Forum***

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## First Breakout: Gulf of Maine and River Interactions

Andy Goode, ASF (Facilitator)

### **Baseline Data:**

- Commercial fisheries
- Seafloor mapping (spotty)
  - A service of the ges(?) and contracts
  - 10m botany
  - high interest
    - critical habitats
    - sediment types, sediment chemistry, circulation
    - seafloor interest
- Circulation patterns in the bay (Neal P.)
- Bottom trawls – inshore (DNR) and offshore (NOAA)
- Surface trawls (NOAA)
- Geochemistry in sediments (GOM database – USGS)
- Historic cod spawning areas
- EPA Benthic Index of Integrity – indicator species
- Satellite chlorophyll (NOAA, Narra, URI)
- Surface temp (satellites)

### **Research Areas:**

- Alewife restoration
- Comprehensive hi-res seafloor map
- River v. sea herring – competition, predation
- Salt-wedge dynamics
- NOAA surveys into the river

### **Research Needs:**

- Hi-res bathymetry
- Estuarine P.O.
- Size of fish populations – stock assessments
  - Anadromous
  - Diadromous
- Shad as a “species of interest” – restoration plan
- Tributaries below the dams – fish populations
- Smelt – short-term success
- Sturgeon
- Economic and social data (3-page summary)
  - Historical v. now
  - Comparisons to other systems
- Pelagic fishery

### **Partners:**

- USGS – Woods Hole
  - Seafloor mapping

- Sediment geochemistry behind impoundments
  - Sediment transport modeling
- USGS – ME District
  - Water quality
- NOAA and DMR
  - Stock assessments
  - Over flights for marine mammals
- Univ of Maine
  - Telemetry and acoustic tracking
- NOAA Mussel
  - Watch data
- Island Institute
  - Marketing
  - GIS layers
- Lobsterman
  - Partners for sampling
- Graduate Students
- Gulf of Maine Council
- NE Fisheries Council

**A Necessary Shared Data Set:**

- Hydrodynamics of Bay
- Geographic divisions (common bounds for USGS/NOAA/DMR)
- Salinity, temp, discharge
- Spatially-explicit data sets (3-D; x-y-z)
- Primary, secondary production layers in a GIS
- Simulations – GIS: for marketing and expert design
- Food web and foraging areas
- Common data sets – MSEXcel and GIS maps

**Funding Sources:**

- Sell it first – public and Congress
- Public – fisherman and Islanders
- NE Consortium (\$ to fisherman and boats)
- Private Foundations (e.g., Pew)
- GOM research institute (not for \$)
- ME SeaGrant
- Federal Agency special grants
- Shift gas tax to oceans

**Other Issues:**

- Habitat
- Bait
- Fish
- Economics
- Social/psychological

## **PENOBSCOT SCIENCE FORUM - FISH PASSAGE SESSION**

### **A. Efficiency of Passage**

- 1.) Success of fish passage options for all species up & downstream (including species that don't use fish passage)
- 2.) Evaluate non-hydro impediments
- 3.) Stress effects of trapping & sorting

### **B. Community/Ecosystem Response to Changes**

- 1.) Target run sizes for all species
- 2.) Fish passage potential on west branch and & other tributaries
- 3.) Compile existing fish distribution data/ID gaps/fill gaps
- 4.) Change in other species' abundance affect on salmon
- 5.) Document age/class/size return for non-salmon

### **C. Operations**

- 1.) Up and downstream stream passage on still water—working group to develop database for all species
- 2.) Establish SOP for all fish passage in watershed
- 3.) Exclusion of non-desirable species
- 4.) Facilitation of fish passage during deconstruction
- 5.) Trapping and sorting
- 6.) Develop management plan for fish passage

## REPORT OF FINDINGS OF WORKING GROUP ON NON GAME SPECIES

Identified work needing to be done on TWO scales: local dam site and broader system issues.

1. Dam sites AND areas where 1' increase in head will occur. (Stillwater, Medway, Enfield..decrease in howland)

Data needs:

- ❖ Mussel mapping
- ❖ Invertebrate inventory
- ❖ Vegetation survey (submergent and riparian zone)
- ❖ Substrate mapping
- ❖ Wetland mapping and NWI ground truthing
- ❖ T and E species inventory: Track wintering Barrow's goldeneye/wood turtle etc.
- ❖ Track piscivorous avifauna and insect hatches

Other comments:

Data available in 1970's study by White and Marony (inverts plus)  
Courtemanch and Gibbs

### 2. System Changes

1. Baseline data on Piscivorous birds

Eagles  
Osprey  
Cormorants  
Mergansers  
Goldeneyes (including Barrow's)  
Others but not priority as above (GBH's, kingfishers)

We need presence/absence at very least  
Seasonality/abundance/distribution/food habits (n-isotopes?)/reproduction/contaminant levels

### 2. Mussels

Mapping, fish hosts etc., habitat changes

### 3. Mammals

Otter  
Mink

Data on relative abundance, contaminants, food source (resident v. marine)

Distribution of marine mammals, food habits

Comments:

Confounding effects of cyanobacteria

Reopen USGS gauging stations

Need coordinated riparian management along the river

FUNDING

System-wide changes could be core of multimillion EPA/NSF grant

Stewardship funds should be put in place for LT monitoring

Need to be prepared to do 2-3 yrs pre study, 1 plus post study, and then monitoring 3-4 yrs, 10 yrs, etc.

Notes from breakout Session #2  
Aram Calhoun

Material not covered in final group discussion (also addressing wrap-up questions 1-6 scheduled for after lunch in original schedule) We realize the Partners may have already done many of the suggestions...just reporting the entire list generated from the discussion:

1. Other contacts that should be made:
  - ❖ Other dam owner/local stakeholders
  - ❖ Maine guides and others; salmon clubs
  - ❖ Local bass angler club
  - ❖ Island Institute/lobster-fisherman associations
  - ❖ All towns along the immediate river
  - ❖ DOT: noted that gas tax from boats..have money for restoration/mitigation, riparian monitoring
  - ❖ MGS/MOGIS
  - ❖ SPO
  
2. Funding Issues
  - ❖ Suggested to know your competitors and where they are going for money
  - ❖ Try finding the Grantsmanship Center in CA for ideas
  - ❖ Market Market Market....Press is money!
  - ❖ Congressional Add-ON
  - ❖ Federal Grant programs (CWA//316...)
  - ❖ National Geographic press and money
  - ❖ NGOS....sierra club, NWF,ORVIS etc.
  - ❖ Sell a book of photos of the River....marketing strategy
  - ❖ Mitigation banking services?????
  - ❖ LL Bean marketing?
  - ❖ King Foundation....rivers and people / culture angle
  - ❖ Toyota teaching grants/education and monitoring
  - ❖ Human Health angles
  
3. Need for a research Clearinghouse/ role of PP/ Penobscot Restoration Planning Committee?
  - ❖ PP maintaining web page with

Committee list and contact info

Bulletin board of research initiatives

Updates on the project/progress reports/announcements/timelines

Status of permitting

Listserve for folks who want to stay informed

Research database: who, where, when, what

Develop a master plan...flow chart...of all research needs, priorities, and if they are being met..

Oversight of GIS initiative

Socioeconomic/cultural master plan for restoration

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**Notes from the Second Breakout Session**

*QUESTIONS DISCUSSED (loosely):*

- *Now that we've held this forum, what are the next steps? Who else should be involved? When should this happen?*
- *Who coordinates? What needs to be done to make this happen?*
- *What are the key funding opportunities to be aware of?*
- *What opportunities for collaboration are created by the PRRP?*
- *What communication pathways should be established?*

*OTHER QUESTIONS:*

- *What is the research agenda?*
- *What is the role of Penobscot Partners?*

**RESEARCH IDEAS:**

- MODELLING POTENTIAL CHANGES
- NUTRIENT CYCLING AND TRANSFER
- GATHERING BASELINE DATA IN ONE PLACE WITH ABILITY TO ADD NEW DATA
- LONG-TERM MONITORING OF INVERTS/VERTS
- OPPORTUNITIES FOR LONG-TERM SAMPLING WITH ABILITY TO ADD ON TO THAT
- STUDIES AT AYERS ISLAND SITE

**COORDINATION:**

**CLEARINGHOUSE/ENTITY** FOR OVERSIGHT -- IDENTIFY CLEARINGHOUSE MODELS --  
NEEDS TO BE INDEPENDENT ENTITY/PERSON -- COORDINATION = RESEARCH/FUNDING

**EXAMPLES and IDEAS:**

- WATERSHED COUNCIL, SACO R. CORRIDOR, TAC, ELWHA RIVER RESEARCH CONSORTIUM
- PEARL/MITCHELL CENTER CLEARINGHOUSE
- COORDINATING COMMITTEE
- RIVER COMMISSION (e.g., Connecticut River Commission)
- NEW INSTITUTE at a UNIVERSITY
- WORKING GROUP
- LEAD PERSON TO OVERSEE/OPTIMIZE COLLABORATION

**OTHER RECOMMENDATIONS:**

- WEB
- GIS SUPPORT
- COORDINATION OF FUNDRAISING EFFORTS
- ADDRESS WAY TO COORDINATE WITH ENTITIES OFF SITE/INFO EXCHANGE WITH OTHER DAM PROJECTS
- ANNUAL MEETING ON PENOBSCOT RIVER OR RIVER RESTORATION IN GENERAL
- REPRESENT PENOBSCOT AT NATIONAL VENUES
- COORDINATE WITH NOAA/GULF OF MAINE OCEAN OBSERVING
- USGS GAUGES REVIVED

\*\* NOTE – WHAT ARE ROLES OF PLAYERS -- AGENCIES, PENOBSCOT PARTNERS, TRIBE, UNIVERSITIES, ETC.?

**LINKING RESEARCH TO MANAGEMENT AND OUTREACH:**

1. CITIZEN MONITORING
2. SCHOOL GROUPS
3. LECTURE SERIES FOR PUBLIC
4. INTERAGENCY MANAGEMENT PLAN (OPP FOR PUBLIC INPUT)
5. UNIVERSITY ED PROF FOR K-12 CURRICULA/ NSF K-12 PROGRAM/MAINE LEARNING RESULTS
6. PENOBSCOT RIVER KEEPERS
7. WATERFRONT ACTIVITIES IN TOWNS ALONG THE RIVER. CONCERTS/FESTIVALS/PADDLING
8. SMALLER COMMUNITY LOCAL RESTORATION PROJECTS/FEED INTO HABITAT RESTORATION PLAN FOR THE RIVER
9. L-T STEWARDSHIP AND NEED TO COORDINATE WITH TOWN OFFICIALS
10. SENIOR COLLEGE COURSE ON RIVER (GEISER)
11. NATIONAL ESTUARY PROGRAM...MIGHT LINK WATERSHED AND GULF OF MAINE ISSUES (POTENTIAL MODEL AS WELL AS CASCO BAY ESTUARY PROJECT)
12. MAINE STREAM TEAM PROGRAM (SCHOOLS TO ADULTS -- HABITAT SURVEYS ETC)
13. OUTREACH/PADDLE TRIP

**OTHER GROUPS TO ENGAGE:**

- SOCIOECONOMIC AND CULTURAL EXPERTISE
- ATTRACT OTHER TRIBES/KNOWLEDGE BASE
- INVOLVE RIVER COMMUNITIES

**WORKING GROUPS:**

- ESTABLISH BY TOPIC AREA; ONE MEMBER OF EACH ON A STEERING COMMITTEE FOR COORDINATION
- SUBSET WORKING GROUP: IDENTIFY PRIORITIES FOR RESEARCH/FUNDING

**FUNDING:**

1. SEED FUNDING TO LOCAL COMMUNITIES TO TAKE ADVANTAGE OF RESTORED RIVERFRONT
2. MORE COLLABORATION, HIGHER OPPOR FOR FUNDING...NEED CORE RESEARCH AGENDA TO PUT FORTH
3. FUNDING SOURCES AVAILABLE THROUGH TRIBES; HELP ON COLLABORATIVE PROPOSALS
4. PRIVATE SOURCES: CORPORATE/FOUNDATIONS/LL BEAN/TOYOTA ETC HELPS TO LEVERAGE OTHER FUNDS
5. NE CONSORTIUM FUNDS

# Summary Notes For PRRP Science Forum Breakout Session #2 – Group 3

(compiled by Clem Fay and Angie Reed, Penobscot Nation DNR)

November 2, 2004

## Group Participants

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Steve Rideout, USGS-Conte Lab  
Catherine Schmitt, UMaine  
Beth Swartz, Maine DIFW-Bangor  
Deb Trefts, Yale University Marine Sciences  
Jeff Varricchione, Maine DEP  
Gail Wippelhauser, Maine DMR

We addressed Questions 1, 4, 5, 6, and 7 in some manner during our discussions, however, the notes are presented in the order we addressed each question, versus the original order in the suggestion list. We did not have time to specifically discuss Questions 2 and 3 from the original list, but feel that these overlapped considerably with Question 1. For follow up on the notes for “Question 1”, please contact Clem Fay at 207-817-7362 or [pinfish@penobscotnation.org](mailto:pinfish@penobscotnation.org). For follow up on the notes for all other questions addressed below, please contact Angie Reed at 207-817-7360 or [areed@penobscotnation.org](mailto:areed@penobscotnation.org).

### ***Question 1: What opportunities for collaborative research are created by the PRRP?***

Somewhat differently than the other groups, we addressed this mostly from a broad process, role, and feasibility/capability perspective, versus matching up specific issues or studies with who might collaborate on them.

UMaine, and Universities in general, are less influenced by political or special interest group agendas and goals than many other potential research entities, and offer equally accessible, diverse, and many times “free”, resources for pursuing identified research initiatives or needs.

USGS was portrayed as similar in these respects, and has a long and productive history of working with UMaine and other regional Universities. USGS may be more appropriate for longer term studies than Universities for studies within their common purview, but not exclusively.

It was further noted that Universities can offer resources across a much broader range of issues and interests than most agencies, such as historical, cultural, and socio-economic aspects, many of which will be integral to the successful implementation and monitoring of progress of the PRRP.

State agencies are typically better able to run long-term, low intensity monitoring studies, pursuant to long term comprehensive planning and/or resource management documents, while the University is better for more specific, intense, and shorter term research needs, especially if such needs are not entirely consistent with management agency mandates and plans (but otherwise provide investigative support to agency plans and potentially guide future agency planning initiatives).

State agencies in particular feel that collaboration with University is critical to getting many research needs addressed in timely manner, due to continuing shortages of staff, equipment, and funding resources amongst the agencies.

Local Communities and/or Watershed Councils need to be developed, educated and inspired about the watershed and project, and appropriate monitoring tasks assigned. Interested schools should also be provided opportunities to be part of community or watershed citizen groups, as well as opportunities for

“supervised” monitoring tasks. Land Grant universities like UMaine can serve “extension” role to facilitate development and education of community/watershed groups. DEP can offer technical assistance, such as training on sampling protocols and database management, to volunteer monitoring programs. County Soil and Water Conservation Districts can also help in all these needs. The Kenduskeag Stream watershed in the Penobscot Basin has established an “evolving” model for such initiatives, which includes at least two schools, the Penobscot County S&WCD, the DEP (via Stream-Team Program), the PIN, and several other collaborating/oversight resource agencies.

The Penobscot Nation is seen as a unique entity in this discussion. The Penobscot River watershed is their historical and current home, and they have been here many thousands of years longer than the rest of us. They, more than any other entity, derive physical, cultural and spiritual sustenance, and ultimately their quality of life, from the ecological health and productivity of their home river. Their resource management and conservation philosophy is holistic and thus very consistent with the goals of the PRRP. They have already collected extensive baseline data on a wide range of water quality parameters in the watershed, and are capable of providing technical resources toward a variety of independent and collaborative research needs of the PRRP in the future, through their fully staffed Dept Nat Resources.

The PIN also offers unique resources and opportunities such as the traditional knowledge and insight of tribal elders as to historical conditions and changes over time since the river first was developed by the settlers.

This collaborative research is a great opportunity to connect with communities and individual people about rethinking how we live on the land. This could be greatly enhanced by more clearly communicating research results and working together to better understand the implications of scientific findings. The University can be a great resource of the historical, social and economic aspects of this work. The USGS can also provide a variety of perspectives including water, geology and biology.

***Question 6: Can funding be leveraged through such collaboration? What are the keys to successfully raising funds for this work?***

Yes – partnerships will be a great asset in accessing different funding opportunities. However we must consider that there are a couple of different kinds of research being discussed and these have different requirements and funding sources – for example, fundamental ecology funding is not at all focused on application like dam removal. There is University level research and the long-term monitoring.

PIN’s involvement as a collaborator in PRRP research and monitoring needs provides a strong and unique source of leverage and/or “match” for collaborative funding opportunities, as well as having access to tribal-specific funding opportunities that no other group could access (e.g. USFWS Tribal Landowner Incentive Program), and which could support certain research needs of the PRRP.

In order to most efficiently pursue collaborative research without overlapping efforts and targeting funding sources as separate pieces of a comprehensive whole it would be best to have a white paper/master document from which to work. This document would have as its basis for recommendations a clear watershed management plan – which is very detailed. Because the “WHY” is generally much more important than the “what” and “how” when seeking funding, this white paper/master document must very clearly state why dam removal or fish are so important. This emphasis will and should make it easy for decision-makers to understand the issues. The document will allow individual researchers to address/pick particular issues to use for grant proposals about which they know. We should collect good and bad examples of these to use as references.

It might be helpful to have a comprehensive list of funding opportunities with details for everyone to use (i.e. a metadata resource on funding sources).

We should have a summary of the background information presented at this Forum as well as the results of all the breakout discussions.

We should not forget private sources of funding – foundations and individuals. Such entities could contribute directly to research or to removal funds, and could help as leverage for other funding (e.g., matches). As such, and recognizing that private donations are very helpful anytime, it was thought that getting some private sponsorship early on in the fundraising process would be most helpful in the longer term.

We should not forget the importance of elected officials caring about the wants/needs/desires of their constituencies.

We should continue letter writing and emails to officials and federal agencies.

We could consider providing a draft resolution/letter of support for towns to pass/submit. This would potentially have the effect of garnering more financial support because others will see the towns as serious players in this effort.

***Question 5: What communication pathways need to be established to facilitate collaborative efforts?***

A regular meeting schedule should be established.

The white paper/master document needs to be put up on the web site so that it can be readily and easily used.

Possibly a listserv or place on the existing web site can be created to encourage continuous dialogue.

***Question 4: Realizing that this forum is just a first step, is there any one missing from your professional area and should be included in future discussions?***

Community planners, education and outreach professionals, consultants/contractors, and graduate students.

***Question 7: How can your efforts best be coordinated with Penobscot Partners and the PRRP?***

Develop an advisory group and include representatives from the social and policy sciences in it.

**Penobscot River Restoration Science Forum  
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Notes from Group 4, Second Breakout Session, October 20
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Our discussion centered on the following topics:

1. first we brainstormed ideas for specific research projects that would either lend themselves to collaboration or were of high priority to the group as a whole
2. next we discussed what type of structure would be needed to support and encourage collaborative research projects
3. then we discussed the kinds of communications that would be needed to support and promote the collaborative research projects
4. we briefly discussed ideas for funding
5. some general discussion on a variety of topics
6. we noted the importance of stewardship of the river & watershed to the importance of the success of the overall goals of the project

### Research Ideas

1. Model the potential and probable changes to the ecosystem (especially the fish populations) that will result from the proposed changes to all dams along the river. May want to consider the social and economic costs and benefits associated with this as well.
2. Track changes in the nitrogen and carbon cycles, especially as it relates to water quality, fish populations, inverts etc.
3. Collect all baseline data into one centralized database accessible to all researchers. Could be used to feed into #1 above.
4. Conduct long-term monitoring of various fish, birds, inverts, mammals etc. that would most likely be affected by proposed changes.
5. Take advantage of occasional sampling already happening, e.g. when someone else is already collecting dead animals, perhaps there are some additional tests that could be done that link to research goals on the Penobscot.
6. Look for opportunities to add new variables on to already existing sampling programs as a way of increasing value of the data with minimal additional effort and expenditure.

### Collaboration Models

There was consensus in our group that a new "Institute" would be extremely helpful and probably necessary to coordinate all research efforts among and across the various sectors. The Institute would need a lead person whose primary responsibility would be to help prioritize and coordinate research needed to satisfy the permit process as well as additional research needed to evaluate the success of the Restoration project and to further our ecological understanding of the effects of such a major dam removal project. In addition, the Institute could possibly provide Web support, GIS capabilities, and coordinate fundraising for research efforts.

The best home for such an Institute would most likely be the University of Maine, because of its independence, the expertise of its faculty, and the opportunity to involve both graduate and undergraduate students in research projects. The group was hopeful that either the Freshwater Group or the Mitchell Center could provide the structure for housing such an Institute or lead person, with the understanding that it would not be prudent or productive to simply add this responsibility on to an existing staff and faculty member.

### Communications

Our group felt strongly that there is a real need to provide many different audiences with good information about the PRR project, its goals, any research being conducted, and ties between the PRR and community prosperity. Following is a list of ideas generated by the group to facilitate this:

1. Host an annual forum bringing together researchers either just from the Penobscot River project or from across the country as a way to exchange information.
2. Offer courses on river restoration to both graduate students and/or consultants.
3. Create a number of Working Groups organized around different topics and/or areas of expertise (much like the morning breakout sessions), with one chair from each WG serving on a Steering Committee that would then disseminate information out to all groups.
4. Link research with management activities and deliver to the public through a variety of venues:
  - a. Involve citizens and/or schools in specific monitoring projects
  - b. Develop a lecture series for the public
  - c. Create an interagency management plan, with opportunities for the public to comment on and provide feedback and advice on the proposed plan
  - d. Develop new K-12 curriculum tied to the restoration project that would be tied to Maine's Learning Results and developed in conjunction with UMO Education professors and students
  - e. Reactivate the Penobscot River Keepers program
  - f. Host a variety of waterfront activities, such as concerts, festivals, and recreation
  - g. Support and encourage local community initiated restoration and/or development projects, including tourism, that would build on and support the broader goals of the PRR project

#### Miscellaneous Comments:

- Need to coordinate research permits needed, especially within the broader project permitting needs.
- Establishing and sharing common collecting protocol is very important.
- Helpful to anticipate what research/monitoring needed to get permits for removal right away and get started on those projects first.
- Look for every opportunity to build additional research effort on top of the work that will be required as part of the permitting of the project.

#### Funding

- First and foremost, funding MUST be leveraged. The projects are so big, the only way to fund them will be by leveraging funds.
- Fundraising should be coordinated through the newly created "Institute"
- Oftentimes matches are required.
- Be careful of federal and University overhead. Is there a way to avoid or minimize the standard 43% (?) normally required by the University if the Institute is established at the University.
- Some agencies, like NOAA, may have more money in the near future (next 5 years) for restoration projects, and perhaps this would be appealing to the University and encourage their support for housing the Institute.

#### Stewardship

Need to pay attention to how NPS (nonpoint source pollution), riparian use and management, and general development are happening in broader watershed, or project may ultimately fail.

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