

## Minutes of the Penobscot Exchange Fall 2009 Meeting

November 5<sup>th</sup>, 2009 10:00 am -12:00pm

UM Senator George Mitchell Center: 107 Norman Smith Hall

### 10:00-10:10 INTRODUCTIONS ~

Note: next exchange meeting will be in spring 2010; PSE meetings are scheduled to be pre- and post-season

### 10:10-11:00 RESEARCH PRESENTATIONS (12 minute presentations with discussion)

1. Brandon Kulik: "Penobscot River Restoration Index of Biotic Integrity Study Background and Status Update" 10:10 AM

Looking for biological signals to tell them how successful their work is. How is overall ecosystem responding? Use ecological indicators (e.g. IBI) to rank ecosystem health on a scale from 1=pristine, intact....6=extreme impairment, poor condition, ecological chaos. Each IBI model is specifically calibrated for a different ecotype.

2002-2007 Maine wide IBI program (>300 sites) --- have developed an IBI model for coldwater (CW) fish assemblages: definitions for 1....6 that are PR specific by reach (upriver, middle, estuarine).

Goals for PR IBI – 1) PR specific standardized methods = sampling guided by QAPP, sampling biased towards species rich habitat types, sample in late spring & fall 2) DATA = predam removal baseline for 2008-2009 ~ 19 permanent monitoring sites w/ data for abundance and distribution of restoration and invasive species, 3) index development is iterative, 4) evaluate ecological response to restoration, 5) provide collateral support for other studies/management.

Challenges – river navigability, timing of runs v timing of field collections, quantifying anadromous component of fish assemblage, developing IBI BCG model for tidal & warmwater ecosystem

Results so far – relict populations of diadromous fish consistently detected, most abundant below Veazie, greatest bio-productivity and diversity below Veazie and see diff species diversity and abundance between fluvial and impoundment habitats, constraints due to fragmentation, see non-indigenous species SMB, LMB but no northern pike (yet).

Few white perch & white sucker in system throughout – perhaps due to die-off of WS in 2004. No white catfish, though someone sent 2 to ASC caught off Cianbro.

2. Steve Coghlan: 10:23 AM
  - Interactive ecology of ATS and SMB: competition for habitat?

6 streams studied = w ATS, SMB or both. Measuring habitat metrics + all fish via snorkeling. Results: ATS use shallow – mid- deep habitat early/mid/late in year and bass have reverse habitat use, so middle period is when they overlap. SMB entry into the mid-depth waters during the middle of the season may cause ATS to move to shallower habitat than they otherwise would have.

- Fish communities in Sedgeunkedunk / dam removal. Add salmon+bass YOY (did not always use YOY)~ saw decrease in detectability of ATS when bass added– are ATS hiding? Using large circular flow-through tank with 3 habitats in it, run trials and check habitat use ~ no diff in ATS and SMB habitat use ~order of introduction but not which species. Found 'resident' fish tend to use edge habitat when other fish is the 'invader', avoiding deeper habitats.
- 2 barriers in Sedgeunkedunk + headwater pond (Fields Pond) – Meadow dam removed in 2008 replaced with rockway + Mill dam removed in August 2009. Results: density (fallfish, white suckers, blacknose dace main species seen) increased sharply below dam after dam removal in 2009 except for WS which didn't react much. Richness decreased below and increased above former dam site. Thus, fish moved upstream after dam removed. NB: ATS fry found upstream 3 days after dam removal~ unexpected – anyone have any ideas?
- Sea lamprey (SL) in Sedgeunkedunk ~ MDN study just getting started. SL rework substrate quite extensively (though not as much as ATS). Tagged SL, got info on SL movement, nest-digging, spawning, location of nests (up/down stream). Hypotheses: SL benefit ATS, SL range will extend after dam removal, SL will improve habitat overall (via substrate reworking, MDN deposition)....will evaluate changes at a variety of temporal and spatial scales – collected first data in 2009 for this & will model ATS habitat quality. Sadly, no SL run in 2009 b/c of record rainfall and gates open all summer (habitat flooded) – so no pre-removal data on habitat use by SL, but do have the habitat well-characterized.

3. Gayle Zydlewski (zyd-less-key) "Sturgeon of the Penobscot and the Gulf of Maine" 10:55 AM

- Collaborative effort of many groups. Began in 2006 to confirm presence of sturgeon (shortnose and Atlantics). Objectives: 1) Refine population estimates, 2) identify their use of the PR, 3) document spawning. Described tagging studies. Results: (1) Population Estimates: April to Dec (b/c receivers removed in Dec when ice in, tho occasionally put back in for a short time when ice is in). Movement of SN: Winter – upper estuary, Spring lower estuary, summer middle estuary, Fall upper estuary= Thought to be a closed population (don't leave river), but found they did leave river! 2007 Kennebec receivers picked up PR SN & caught AS tagged in the 1990s. Since are open population after all, more complex to model – preliminary data for PR abundance, emigration, immigration based on tagging and models. 2009 used same sampling regime so will have more data by this fall/winter. (2) Overwintering Site: In 2006 (?), found an overwintering site just upstream of Cianbro in PR. Showed DIDSON video acoustic imaging; counted individual sturgeon at this site. Able to

estimate abundance for this overwintering site (~ 500 individuals). (3) Documenting spawning: all moved downstream to spawn, opposite of what they expected to see. Is it because of habitat suitability? Looked at bathymetric model for PR based on velocity suitability, and it indicates very suitable habitat just below Veazie dam ~ tried to collect eggs there in 2009 in the tailrace without success.

- What about Atlantic sturgeon? Want to develop movement model. Showed habitat use in PR less clearcut than SN (?). SCUTES program (3<sup>rd</sup> – 5<sup>th</sup> grades + HS students working with researchers on sturgeon research – there is a website for Hampden students). Using a pop-up satellite tag. Theory that they leave PR and go off Kennebec River. When tag pops off (this winter?) they'll be able to see where they are. Future work: have documented them moving to the West, including in the Saco River, but haven't seen any moving to the East yet. Want to develop a geographically (?) wider model.

How well documented are Kennebec spawning sites? Documented in the 1990s but may not be much habitat information though could be obtained. In spring looked like they saw late stage SN females spawning in the Kennebec so in 2010 will look in Kennebec.

### **11:00-11:20 RESEARCH UPDATES (3 minute updates with discussion)**

1. Margaret Guyette: "The role of marine derived nutrients delivered by anadromous fish in restoration of freshwater ecosystems in the Penobscot River watershed"

Oral Presentation only – no PPT: 1) sediment coring of PR lakes – alewife vs no alewife + control lakes outside of PR – has pilot data indicating longer core analysis is warranted (using stable isotopes to tie alewife presence to ??), 2) stream project : 4 streams - stocked ATS in May 2009 & added nutrients (ATS carcass analog) in July and Oct 31 (to simulate when sea lamprey would be spawning in the streams (July) and when ATS would be spawning (Oct)) = BACI design; monitoring productivity in the stream from bottom up to ATS grow and health (otolith analysis, etc) ~ and tie into nutrients which have a MDN signature (stable isotopes)

2. Karen Wilson: "A brief update on the Pre-dam baseline food web assessment using stable isotopes"

Goal: connect what happens in bay to what happens in river ~ is there a transfer of nutrients in either direction (juvenile production and adult returns) – using stable isotopes. Long term project. 2009-2010 is to set the baseline. Do the stable isotopes look different between FW and SW food chains (showed N15 and C13 graph) ~ these two segregate nicely. Listed the target species (entire food web) to map out the food web accurately. Sampled above and below V and GW dams + 5 tributaries in spring and fall 2009. Hard to coordinate with IBI sampling. Marine sites: Verona Island, Belfast Bay, Camden, Vinalhaven – target species will depend on who is most abundant. Collected by ponar grabs, hook and line and other methods.

3. Oliver Cox: "DMR's Penobscot River Activities" 11:22 PM

Smolt stocking – 600,000 into lower PR April 2009 by US FWS

Fry stocking ~ 1 million fry throughout the PR drainage in May 2009 by DMR

Smolt Trapping in Pleasant River drainage ~92% of the ATS stocked as fall parr go out as p8s (go out after 8 months in the river), 8% of p20s (go out after 20 months in the river). All had a left ventral clip in 2009.

Piscataquis drainage ~ monitoring smolt emigration relative to DMR management.

Veazie counts – 1958 ATS (150 recaptured from earlier in the season). Run time typical (June 18<sup>th</sup> median) + 2336 alewives, 674 sea lamprey, 0 shad (do not use fishway, so not surprising), 0 striped bass. In 2009 had 'tiger trap' so able to get alewives & SL. Related captures of ATS to discharge and water temperature (24 C at peak, only handled 33 ATS since then). Big divergence in 2008 and 2009 ~ not seeing a fall run. Alewives run done by end of May basically. SL similar timing as alewives.

Pre-spawning adult release ~ evaluate the post release distribution and spawning behavior of adult ATS in novel (non-imprinted) habitat. Can they track ATS late in the season to new habitat to expand distribution? Imprinted to Veazie head pond, released in October 2009. 29 are radio-tagged females – have gone a long distance, all over, and still tracking them

4. Alice Kelley: "Penobscot Geomorphological Monitoring and Surficial Mapping" 11:30 AM

Abiotic site of the ecosystem. Update on geomorphology prior to dam removal. Are behind in study. Showed river cross-section sites chosen in the Howland area = in river and the floodplain, shape and grain size – do twice before end of the 2 year project. USGS will be on the river in mid-November 2009 using tethered boats. Focus on GW impoundments first – cross section monitoring & seismic data to determine depth of sediment to the bedrock.

USGS mapping study: Surficial geologic mapping done on quads for Bangor, Veazie, Bucksport, and Hampden and available. Also have a Bluff mapping program for all coastal areas of Penobscot Bay + Hampden down. Contact Alice if need these.

5. Other 11:35 AM ~ BSA will send out an email for updates since we are running behind

6. Theodore Willis 11:35 AM

USM PR Activity in 2009. ~ statewide project: alewife and blueback herring genetic sampling. 1012 samples out for processing (data expected in May 2010). 8 sampling sites, both rivers and ponds. Looked at adults, YOY and not stocked from Brunswick.

Learned – shad are difficult to catch. Could use salmon club member help in catching these. Need better info on when runs start and stop. Juveniles may be viable

Graduate position available on this project – see Theo

Alewife acoustic tag released at Veazie, Segunjdgedun, Soudabaswcook

Chemo Pond pre-removal water quality in 2009 and again in 2010.

**11:20-12:00 RESEARCH COORDINATION (5-10 minutes each) 11:43 AM**

1. DSRRN Update (5 mins)

Karen 11:43 AM

160 participants at the July Science Meeting. Lots of workshop ideas generated. Core Partners and DSRRN PIs distilled ideas down to 3 workshops: 1) Factors contributing to resilience in multi-species, including biotic and abiotic factors, 2) Natural variability in biotic and abiotic factors esp because of CC, 3) Management: what simple measures can be used to measure system resilience (beyond #s of fish). Final Science meeting in 2012: Integrate Science and Management to Increase Restoration Success.

Workshop products: meta analysis/literature review. If interested in being involved in planning of workshops or a participant: Time commitment is 1 h conf call/month. Need some buy-in to the workshops. These are 20-40 people maximum.

BSA asks group for recent papers that should be shared via the website.

2. Penobscot Trust ARRA monitoring (10 mins)

Blaine 11:46

Monitoring coordinator for the Penobscot River Restoration Trust. 1) How the ARRA relates to some monitoring work, 2) context of how this work fits into a larger monitoring framework, 3) Investigators have opportunities to link into the ARRA award.

1/3 of award is for monitoring pre- and post-removal of the two dams. Must generate jobs and project/performance period is well-defined: Summer 2009 – Summer 2011. Looking for opportunities to keep work going beyond 2011 and asks PSE folks to keep this in mind.

Monitoring Levels: Level 1 – data for permitting requirements, Level 2 – research to evaluate the outcomes of the restoration = they are promoting this, Level 3 – research to further our understanding of large river ecosystems = most PSE folks working in 2 and 3. Common ground of Trust and PSE is Level 2.

PRSSC Conceptual Framework of 2008

Gulf of Maine Council Monitoring Framework ofn 2007 (Collin et al 2007)

NOAA Monitoring priorities for the PRRP Draft 2008 - cross between GOMC and PRSSC documents = this is what is represented in the ARRA award to the Trust. Chose the parameters listed as high priority in the other two frameworks.

Discussed the funded projects:

-Kelley, Belknap and Dudley physical/geomorphological monumented cross section sites. Opportunities for leveraging your own work here.

-Joe Z Fish passage (reach level) of ATS

-Gayle Z. 1) SN spawning and habitat use & 2) diadromous species assemblages below Veazie using acoustics (Biosonics) that acts as a gate in the river – cannot get species identification as easily as with the DIDSON.

-Coghlin, Kulik ~ Fish Community (reach level) work, focused on dedicated electrofishing platform that will continue with assessments and available to support other PRRP projects.

Other projects: USGS gage work, WQ with PIN and USGS, benthic invert community composition, MDN work, wetland and riparian community assessment

Showed PRSSC Core Parameters chart indicating which parameters are being monitored and which are not. – opportunities for collaboration ?

3. Transect Subcommittee (5 mins)

Karen/Matt 12:03 PM

Committee for selecting the monumented cross-sections. Kelley is setting these in stone. Some are biological, others geomorphological. This is done. But can add more transects ~ communicate with her via email BSA will contact folks via email to see who is interested in doing this and identify a small group interested in doing this, including multi-investigator studies.

4. Future Multi-disciplinary Studies (15 min Brainstorming Session) Barbara/all ~ will leave for a later date b/c are running out of time today.

*Note: This is a facilitated discussion about the possible creation of a subcommittee or workgroup that would focus on promoting, coordinating, or actually conducting multi-disciplinary studies on the Penobscot. This idea has been suggested by several in the Trust, NOAA, & Exchange.*