The Diadromous Species Restoration Research Network Science Meeting 2009

Restoration of Diadromous Fishes and Their Ecosystems: Confluence of Science and Restoration

22 – 24 July 2009 at the University of Maine, Orono, Maine

Ecosystems Interactions Breakout Session Notes

Melissa Laser, lead moderator

Brainstorming Portion

Major Themes

- 1. Environmental Change-Climate and hydrologic
- 2. Human/Social Dimensions-land use, political, economic, management
- 3. Resource Linkages (freshwater-freshwater, marine-marine, freshwater-marine, prey-predator, etc.)
- 4. Historic Process/Modern Context

Submitted Key Questions (not ranked)

- 1. How do we focus on key processes (I.D. the 5% key processes and not single species)?
- 2. What are and are not critical factors for fish passage?
- 3. How do we get better at including social issues integrated into our ecosystem assessments?
 - a. What are embedded social dogmas based on?
 - b. How to change focus from NIMBYism to focus on how ecosystem stewardship can benefit MBY.
 - c. How to remind people that they are the deciders/government?
 - d. Where best to focus social change? FED, state, region, town, lake association?
 - e. How can we support/respect "legacy" social traditions while promoting ecological restoration?
- 4. How do we learn more about the white water-blue water (fresh-salt) linkages?
- 5. Will predator populations increase with increase of pre (cod-capelin, cod-alewife, striped bass-mehaden).
 - a. How do prey abundances influence behavior, life history, age structure?
- 6. What will change in prey (diadromous species) do to fish community structure?
- 7. How will we know how these changes influence or are influenced by behavior?
- 8. How do we balance between people's love of lobster and cod (which eat them) and manage social expectations/concerns?
- 9. how will/is climate change going to impact restoration and need for more future restoration?
- 10. how do we change attitudes?

- 11. How will population increase of diadromous species change trophic structure, change in gamefish size and abundance?
- 12. How do we manage public perceptions of outcomes-what aspects resonate? Numbers, location (e.g. not historic numbers or conditions)?
- 13. How will restoration vary spatially with differing cultural setting and natural settings-for watershed input buffer, other barriers, etc.?
- 14. How do we learn about and prepare for expectations of temporal scale for change of ecosystems?
- 15. Do we understand enough about temporal and spatial scale in the context of geology, hydrology, climate, and biology?
- 16. What can we learn from and what do we still need to learn from historic changes to processes and physical habitat (flow, sediment transport and supply, channel morphology)?
- 17. What land use changes will/have impact/restoration efforts changes to land cover, sediment/erosion, past logging practices?
- 18. Are streams able to move within channels and will they with increased flows over time?
- 19. What is caused of region wide herring decrease (coastal management, freshwater interactions, predators, bycatch, inland management)?
- 20. How can we address the social blockages? Game fish interactions, nutrients, difference between landlocked and migratory alewife, "overcome social inertia" and misinformation?
- 21. What are the impacts of water withdrawals (agricultural use, drinking water) and agricultural runoff from cranberry, blueberry, etc.?
- 22. How do nutrients move in and out of systems with fish? Some similarities, many differences with Pacific Northwest.?
- 23. How can we describe and sell the local linkages of sea-run fish with their local favorites (striped bass-herring, brook trout-herring-cod)?
- 24. How do we overcome institutional/inter-governmental barriers to restoration, to understanding science, benefits?
- 25. Is lack of herring driving marine predators? (lower lipid foods, "junk food hypothesis" therefore change in life history (maturation and age structure and behavior to location and when)?
- 26. What are the effects of exotic species (basic ecological, ramifications of control, social aspects (sportfish, nutrients, ignorance, I.D.ing)?
- 27. Are there umbrella species or processes that could focus efforts (restoration, monitoring)?
- 28. Are there ways to minimize disconnects among people?
 - a. Among scientific disciplines
 - b. Managers
 - c. Levels of government
 - d. Joe Plumber
- 29. What are the gaps in knowledge of freshwater and marine ecosystems?
- 30. How do we prioritize restoration (places, components, processes)?
- 31. How can we streamline restoration efforts?

- 32. How do we learn more about reach-scale dynamics (LWD, sediment transport and size partitioning)?
- 33. How do we deal with institutional barriers-layers of complexity?
- 34. Is connectivity the major process to focus on?
- 35. What are the parallels between past and present?
- 36. How do we integrate interdisciplinary information/disciplines?
- 37. What are the key factors/processes we can focus on?
- 38. Develop hypotheses of change for key processes, ecological interactions, etc. for management after today and further research.

Summary Portion

Ranked Themes (based on number of dots)

- 1. Resource Linkages (freshwater-freshwater, marine-marine, freshwater-marine, pre-predators, etc.)
- 2. Human/Social Dimensions (land use, political, economic, management)
- 3. Historic process/modern context
- 4. Environmental Change (climate and hydrologic)

Highest Ranked Key Questions (based on number of dots)

- 1. What are the gaps in knowledge of freshwater and marine ecosystems? (22 dots)
- 2. How do we change attitudes/address concerns? (10 dots)
- 3. What can we learn from and what do we still need to learn from historic changes to processes and physical habitat (flow, sediment transport and supply, channel morphology)? (9 dots)
- 4. Are there ways to minimize disconnects among people? (8 dots)
 - a. Among scientific disciplines
 - b. Managers
 - c. Levels of government
 - d. Joe Plumber
- 5. What is the cause of region wide herring decrease (coastal management, freshwater interactions, predators, bycatch, inland management)? (7 dots)