The Elwha Nearshore: Linking Management, Education, and Research to Achieve Ecosystem Restoration. Priority Recommendations of the Elwha Nearshore Consortium, (ENC) 2009.

Compiled by: Anne Shaffer, ENC Coordinator, Washington Department of Fish and Wildlife 332 E. 5th Street Port Angeles, Washington. 98362

and

Dwight Barry, Director, Center of Excellence, Peninsula College, Port Angeles Washington 98362.

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Abstract

The Elwha Nearshore Consortium (ENC) held its annual meeting at Peninsula College in Port Angeles on 8 January 2009 during which the group identified a number of additional priorities for 2009. Priorities include defining linkages in estuarine and shoreline nearshore sediment delivery processes, Lidar mapping of high bluff beaches in the Elwha and comparative drift cells, continued long term monitoring and detailed study of fish use of the nearshore Elwha and comparative drift cells, focused assessment of cross regional linkages of salmonid use of the nearshore, and modeling of physical habitat processes and biological function of the Elwha nearshore, including beaches and estuaries. ENC priorities should provide clear guidance to regional entities action planners on priorities for restoration, research, and education for achieving local and cross regional scale restoration in the Salish Sea.

The Elwha Nearshore Consortium consists of approximately 40 scientists, managers, and stakeholders dedicated to understanding and promoting the nearshore restoration associated with the upcoming Elwha dam removals. The ENC closely mirrors the goals and priorities of a number of regional research and restoration entities, including Washington Sea Grant and the newly formed Puget Sound Partnership. Regional Marine Research and Information Needs identified collaboratively by the West Coast Sea Grant programs and Puget Sound Partnership Action agenda priorities are embodied in the work and priorities of the ENC. Cross cutting issues common among the three entities include: identifying and addressing priority scientific data gaps, ecosystem-based restoration that provides the highest level of recovery certainty, and informed and engaged education and citizen science.

Background

The Elwha Nearshore Consortium was convened in 2004 to understand and promote the nearshore restoration of the Elwha, a restoration project of unprecedented scale slated to begin in

2012. Background materials may be found at the Clallam MRC webpage (clallammrc.org) and at the Elwha Watershed Information Resources (www.elwhainfo.org). The nearshore component of the Elwha restoration project is unique and complex due to the mosaic of landowners and jurisdictions involved. The consortium reflects this complexity, with 40 members of local, state, citizen, tribal, and federal entities. The group is extremely active in research, restoration management, and citizen collaboration and outreach.

The ENC held its annual meeting at Peninsula College in Port Angeles on 8 January 2009. Members provided synopsis of their work to date and plans for the upcoming field season. The group also identified the following additional priorities for 2009. This year the ENC identified the following projects as priorities to achieve our goal of understanding and promoting Elwha nearshore restoration. These priorities mesh strongly with the Puget Sound Partnership and Washington Sea Grant action agenda priorities listed in Appendix 1.

Table 2. Technical work:
Table 2. Lower River and Estuary
Table 2. Monitoring:
Table 2. More detailed and comprehensive sediment mapping and study of lower river and estuary;
Specifically:
Table 2. Extend current river sediment mapping study north to include river mouth
b. Model linkages between habitat use (fish abundance) and sediment processes in lower river and shoreline.
1. Fish use in lower river correlated with physical process dynamics (sedimentation), and;
2. Forage fish and sediment characterization work underway is being led by DNR, WDFW, and Peninsula College with collaboration of USGS is a high priority
c. Expansion of upcoming Lidar study to include estuary, and land based Lidar for bluffs along lower river and shoreline, to and including Dungeness Spit;
d. Comprehensive assessment of water quality in impounded, east, and west estuary (CTD's, not just hand held YSI readings).
e. Long term monitoring of ecological function, including fish use, of the entire estuary (east, west, and impounded areas).

B. Shoreline
Table 2. Monitoring
a. Linkage and additional work focusing on forage fish spawning and sediment mapping;
b. Long term basic monitoring of fish use of the Elwha nearshore
c. Nearshore habitat report and sediment mapping (USGS) update
Table 2. Further east and comparative areas;
Table 2. Offshore and inshore to include eelgrass area (MLLW-25-30')
Table 2. Incorporate fish data
Table 2. Mapping of the historic Elwha nearshore (Brad Collins style study);

Table 2. Definition of relative contribution of bluff erosion to sediment budget of Elwha, Dungeness drift cells. Ground based shoreline Lidar.

Table 2. Management: Develop and implement a long term restoration strategy for the Freshwater Bay, including the Elwha estuary. The restoration strategy will include both preservation (acquisition/conservation easement of the Freshwater Bay shoreline associated properties) and restoration (providing long term ecoysystem restoration for the Elwha estuary, including hydrologic connectivity to the impounded west estuary).

C. Riverine linkages to nearshore

Table 2. Monitoring

a. Monitor of discharge of river from suspended sediments prior to dam removal
b. Extend UC Santa Cruz graduate student work mapping course sediment movement to upriver and along the shoreline

II. Education

Table 2. Continue working with Peninsula College, WWU, UW and other higher education programs to provide professional education in identifying and addressing priority scientific and management issues. Continue NSF REU program.

III. Data compilation and publication

Table 2. Publication (dedicated) of science emerging from our work

B. Data repository

IV. Cross Regional Fish biology

A. More detailed information on forage fish life history and linkages with sediment processes

B. More comprehensive genetic study for all salmonid species focusing on genetic identification of fish use of the Elwha nearshore and linkages with the coast and inland waters of Puget Sound.

The Elwha Nearshore Consortium closely mirrors the goals and priorities of a number of regional entities, including the Washington Sea Grant and newly formed Puget Sound Partnership. Cross cutting issues include identifying and addressing priority scientific data gaps, ecosystem based restoration that provides the highest level of recovery certainty, and informed and engaged education and citizen science. Washington Sea Grant Marine Research and Information Needs, and Puget Sound Partnership Action agenda priorities are summarized below. Those that are addressed by the ENC priorities are highlighted in Table 1, which provides a cross link between the Elwha Nearshore Consortium, Washington Sea Grant, and Puget Sound Partnership priorities.

Table 1. Elwha Nearshore Consortium priorities, Puget Sound Partnership, and West Coast Sea Grant Research Needs cross reference table

Elwha Nearshore Consortium		Puget Sound Partnership Priority	West Coast Sea Grant Research Needs
Monitoring	Monitoring (lower river, estuary, and shoreline of Elwha and comparative drift cells).	Priority B, D, and E	Topic 4. Marine Ecosystem Structure and Function; Topic 5. Ocean Health and Stressors, and; Topic 6. Ocean Processes.
	More detailed and comprehensive sediment mapping and study of lower river and estuary; specifically: Extend current sediment mapping in the lower river north to include river mouth	Priority B, D, and E	Topic 4. Marine Ecosystem Structure and Function; Topic 5. Ocean Health and Stressors, and; Topic 6. Ocean Processes.
	Model linkages between habitat use (fish abundance) and sediment processes in lower river and shoreline. Specifically: 1.Fish use in lower river and shoreline correlated with physical process dynamics (sedimentation)	Priority B, D, and E	Topic 4. Marine Ecosystem Structure and Function; Topic 5. Ocean Health and Stressors, and; Topic 6. Ocean Processes.
	2.Long term monitoring of ecological function, including fish use, of the	Priority B, D, and E	Topic 4. Marine Ecosystem Structure and Function; Topic 5. Ocean Health and Stressors, and; Topic 6. Ocean Processes.

	entire estuary (east, west, and impounded areas).		
	3.Continue work focusing on forage fish spawning and sediment mapping Continue and expand forage fish and sediment characterization work underway is being led by DNR, WDFW, and Peninsula college with collaboration of USGS is a high priority 4. Continue and expand nearshore habitat report and sediment mapping (USGS) update to include: a. Further east and comparative areas; b. Offshore and inshore to include eelgrass area (MLLW-25-30')	Priority B, D, and E	Topic 4. Marine Ecosystem Structure and Function; Topic 5. Ocean Health and Stressors, and; Topic 6. Ocean Processes.
	Expansion of upcoming Lidar study to include estuary, and land based Lidar for bluffs along lower river and shoreline, to and including Dungeness		Topic 4. Marine Ecosystem Structure and Function; Topic 5. Ocean Health and Stressors, and; Topic 6. Ocean Processes. Topic 8 Resilience, Robustness and Adaptability to Hazards and Change (re: bluffs)

	Spit;		
	Comprehensive assessment of water quality in impounded, east and west estuary (CTD's, not just hand held YSI readings).	Priority B, D, and E	Topic 4. Marine Ecosystem Structure and Function; Topic 5. Ocean Health and Stressors, and; Topic 6. Ocean Processes. Topic 7 Water Quality and Pollution
	Mapping of the historic Elwha nearshore (Brad Collins style study);	Priority B, D, and E	Topic 4. Marine Ecosystem Structure and Function; Topic 5. Ocean Health and Stressors, and; Topic 6. Ocean Processes.
	Definition of relative contribution of bluff erosion to sediment budget of Elwha, Dungeness drift cells. Ground based shoreline Lidar.	Priority B, D, and E	Topic 4. Marine Ecosystem Structure and Function; Topic 5. Ocean Health and Stressors, and; Topic 6. Ocean Processes. Topic 8 Resilience, Robustness and Adaptability to Hazards and Change (re: bluffs)
	Monitor of discharge of river from suspended sediments prior to dam removal Large particle mapping work extended upriver and along the shoreline	Priority B, D, and E	Topic 4. Marine Ecosystem Structure and Function; Topic 5. Ocean Health and Stressors, and; Topic 6. Ocean Processes.
Management			
	Develop and implement a long term restoration strategy for the Freshwater Bay, including the Elwha	Priority A, B	Topic 1. Vitality of Coastal Communities; Topic 4. Marine Ecosystem Structure and Function; Topic 5. Ocean Health and Stressors, and; Topic 6. Ocean Processes.

	estuary. The restoration strategy will include both preservation (acquisition/conservation easement of the Freshwater Bay shoreline associated properties) and restoration (providing long term ecosystem restoration for the Elwha estuary, including hydrologic connectivity to the impounded west estuary).		
Education	Continue working with local colleges and education groups	Priority E	Topic 1. Vitality of Coastal Communities; Topic 4. Marine Ecosystem Structure and Function; Topic 5. Ocean Health and Stressors, and; Topic 6. Ocean Processes.

Table 2. Elwha Nearshore Consortium members:

Name	**Affiliation**	**Email**
Anne Shaffer	***Washington Department Fish Wildlife***	shaffjas@dfw.wa.gov
Doug Morrill	***Clallam Marine Resources Committee***	dmorrill@elwha.nsn.us
Cathy Lear	***Clallam County***	Clear@co.clallam.wa.us
Matt Beirne	***Lower Elwha Klallam Tribe***	beirne@elwha.nsn.us
Brian Winter	***Olympic National Park***	brian_winter@nps.gov
Helen Berry	Washington Department Natural Resources	helen.berry@wadnr.gov
John Cambalik	Puget Sound Partnership	john.cambalik@psp.wa.gov
Amy Draut	USGS	adraut@usgs.gov
Jeff Duda	USGS	Jeff_Duda@usgs.gov
Bill Eaton	Peninsula College	Bille@pcadmin.ctc.edu
Rob Elofson	Elwha Tribe	relofson@elwha.nsn.us
Kurt Fresh	NOAA	Kurt.Fresh@noaa.gov
David Freed	WSU Beachwatchers	Dfreed@co.clallam.wa.us
Guy Gelfenbaum	USGS	ggelfenbaum@usgs.gov;
Brad Hanson	NOAA	Brad.Hanson@noaa.gov
Clea Rome	USDA Natural Resources Conservation Service	clea.rome@wa.usda.gov
Raymond Moses	Elwha Tribe	rmoses@elwha.nsn.us
Kathryn Neal	City of Port Angeles	Kneal@cityofpa.us
Chuck Nittrouer	University of Washington	nittroue@ocean.washington.edu
Jim Norris	MRC	jnorris@olympus.net
Andrea Ogston	University of Washington	ogston@ocean.washington.edu
Dave Parks	Washington Department Natural Resources	dave.parks@wadnr.gov
Chris Caudill	University of Idah[SB1]	caudill@uidaho.edu
Derek Poon	EPA	Poon.Derek@epamail.epa.gov
Tim Randle	BoR	TRANDLE@do.usbr.gov.
Bill Ritchie	WDFW	Bill.Ritchie@dfw.wa.gov
Don Rothaus	WDFW	ROTHADPR@dfw.wa.gov
Pam Sanguinetti	CoE	Pamela.Sanguinetti@usace.army.mil
Bob Sizemore	WDFW	SIZEMRES@dfw.wa.gov
Karen Steinmaus	Battelle	karen.steinmaus@pnl.gov
Jeffree Stewart	Washington Department of Ecology	jste461@ecy.wa.gov
Steve Todd	PtNoPt Treaty Council	stodd@pnptc.org
Larry Ward	Elwha Klallam Tribe	lward@elwa.nsn.us
John Warrick	USGS	jwarrick@usgs.gov
Rob Young	Western Carolina University	ryoung@wcuvax1.wcu.edu

Appendix A. Cross cutting priorities for ENC, Puget Sound Partnership, and Washington Sea Grant.

The Puget Sound Partnership Action agenda
http://www.psp.wa.gov/downloads/ACTION_AGENDA_2008/Action_Agenda.pdf
is based on the state legislature's charge to the Puget Sound Partnership, specifically to:

ψIdentify work needed to protect and restore Puget Sound, based on science and with clear and measurable goals for recovery;
ψDetermine accountability for achieving results including performance, effectiveness, and the efficient use of money spent on Puget Sound; and
ψPromote public awareness and communication to build support for a long-term strategy.

The Puget Sound Partnership Action Agenda priorities identified to accomplish these goals are as follows:

Priority A: Protect the intact ecosystem processes, structures, and functions that sustain Puget Sound. Avoiding problems before they occur is the best and most cost-effective approach to ecosystem health.

Priority B: Restore the ecosystem processes, structures, and functions that sustain Puget Sound. Protecting what we have left is not sufficient, and significant effort at an unprecedented scale is needed to undo past damage. *The Action Agenda identifies a comprehensive restoration strategy for Puget Sound ecosystems that reflects three primary objectives:*
B.1 *Implement and maintain priority ecosystem restoration projects for marine, marine nearshore, estuary, freshwater, riparian, and upland areas.*
B.2 *Revitalize waterfront communities while enhancing marine and freshwater shoreline ecosystem processes.*
B.2.1.2 Prioritize habitat restoration at cleanup sites located near intact ecosystems and where the probability of re-creating ecosystem function is high.
B.2.1.3 Improve access to shorelines for recreation.
B.3 *Support and implement stewardship incentive programs to increase the ability of private landowners to undertake and maintain restoration projects that improve ecosystem processes.*

Priority C: Prevent water pollution at its source. Many of our efforts have focused on cleaning up degraded waters and sediments, but insufficient resources have been devoted to stopping pollutants before they reach our rivers, beaches, and species.

Priority D: Work together as a coordinated system to ensure that activities and funding are focused on the most urgent and important problems facing the region. Many of the programs and laws now used to regulate or support activities in Puget Sound were established on a piecemeal basis to address individual problems. Strategies that will help to address problems more effectively at an ecosystem scale include improved coordination of land use planning, water supply, ecosystem protection, transportation, and species recovery plans. The Action Agenda calls for the reform of environmental regulatory programs as well as improvements to the capacity of local partners to implement actions and compliance efforts across Puget Sound.

D.1 Conduct planning, implementation, and decision-making in an integrated way and with an ecosystem perspective.
D.2 Support, develop, and integrate climate change programs, including mitigation and adaptation strategies to improve local and regional readiness for anticipated changes.

Priority E: Build an implementation, monitoring, and accountability management system.
This includes:

- Using a **performance management system** with adaptive management and clear pathways for decision making, coordinated monitoring, accountability for action, and coordinated data management;
- Providing **sufficient, stable funding** focused on priority actions; • Implementing a **focused scientific program** with priorities for research, and developing appropriate measures to improve understanding of the ecosystem and the effectiveness of our actions; and
- Increasing and sustaining **coordinated efforts for communication, outreach, and education.**

Priorities for Puget Sound Partnership Action Agenda implementation that directly link to the Elwha Nearshore Consortium priority actions are:

1. Implement restoration projects in the salmon recovery three-year work plans and the Estuary and Salmon Restoration Program of the Nearshore Partnership (Elwha listed as a top priority)
2. Complete the Puget Sound Nearshore Partnership's General Investigation in a timely way to help identify and refine nearshore restoration opportunities and move toward implementation.
3. Complete large-scale restoration projects at the mouths of major river systems in Puget Sound where there is a high likelihood of re-creating ecosystem function.
4. Implement coordinated incentive and technical assistance programs for private landowners through the Conservation Commission, Conservation Districts, Department of Natural Resources, other state agencies, Washington State University Extension, local governments, non-governmental organizations, and others as appropriate.
8. Restore floodplain and river processes where there is a high likelihood of re-creating ecosystem function.
9. Remove significant blockages of ecosystem processes and provide access to habitat.

The Elwha system is identified in the Strait action agenda, which states that 'The Elwha River contains two dams that completely block fish passage to more than 70 miles of pristine mainstem and tributary habitat (95 percent of the historic habitat for Elwha Chinook), and the dams have impeded water quality, quantity, and sediment transport. Disruption of the sediment supply from the Elwha (and adjacent marine bluffs) has depleted the replenishment of Ediz Hook, and major rock revetments and maintenance by the U.S. Army Corps of Engineers have been necessary to prevent the Hook from eroding.' This is a start-but there is much more to add. The action agenda specifically references Port Angeles harbor as a pilot project for community clean up. Port Angeles Harbor is within the Elwha drift cell. It therefore follows that the Elwha Nearshore consortium recommendations therefore should provide powerful scientific, management, and citizen guidance to the Puget Sound Partnership as it implements the Strait Action Plan.

The Sea Grant Regional Marine Research and Information Needs Report is now available in draft form at http://www.wsg.washington.edu/research/pdfs/WCRMRIN.pdf. The primary goal of the Sea Grant West Coast planning process has been to identify continued and new research

and outreach related to the California Current Large Marine Ecosystem (CCLME), which stretches from Baja California to Vancouver, British Columbia, that would contribute to the transition toward an ecosystem-based approach to ocean and coastal management. The goal is not to create a Sea Grant plan, but rather to establish priorities that foster collaboration among a full range of regional information providers and end users. The plan identifies a number of topic priorities that focus on regional research perspectives born out of the US Commission on Ocean Policy and the Ocean Research Priorities Plan and Implementation Strategy (ORPP). The research and information needs presented in the report are cross-referenced to the West Coast Governors' Agreement on Ocean Health (WCGA) West Coast Governor's Action Plan, whose action include Action 6.1 – Develop a regional research agenda in partnership with the four Sea Grant programs and seek federal support to fill marine research needs identified. Cross cutting theme relevant to the Elwha nearshore consortium identified include Ocean Education and Environmental Literacy and Professional Training. Priority Topics that are directly addressed by the Elwha Nearshore Consortium are:

Topic 1. Vitality of Coastal Communities
Topic 4. Marine Ecoysstem Structure and Function
Topic 5. Ocean Health and Stressors
Topic 6. Physical Ocean Process and Coastal Hazards
Topic 7. Water Quality
Topic 8. Resilience