



NPLCC Conservation and Sustainable Resource Management Objectives

For NPLCC Partnership Activities



Task: “Step down” from the Conservation and Sustainable Resource Management Goals to *identify measurable objectives*

- What would success look like?
- How do we measure our progress towards success?
- How do we know when we have funded enough for a priority resource?



“If you don’t know where you’re going, you might wind up someplace else” –
Yogi Berra



Conservation and Sustainable Resource Management Goals

Priority Resource	Significant climate related stressor	Priority Topic
Rivers, Streams, and Riparian Corridors (and associated biota)	Hydrologic regime shifts	Effects of hydrologic regime shifts on Rivers, Streams, and Riparian Corridors
Forests (and associated biota)	Change in air temperature and precipitation	Effects of changes in air temperature and precipitation on forests
Marine shorelines, the Nearshore, and Estuaries (and associated biota)	Changes in sea level and coastal storms	Effects of changes in sea level and coastal storms on marine shorelines, nearshore, and estuaries
Anadromous fish	Hydrologic regime shifts	Effects of changes in the hydrologic regime on anadromous fish
Biological communities*	Diseases, pest, and invasive species	Invasive species, diseases, and pests and their effects on biological communities

* Biological communities was defined as an emergent attribute of an ecosystem, including species composition and interactions: degree of co-evolution, predation, competition, biodiversity, mutualism, vegetative cover alterations, etc.



Overall Conservation and Sustainable Resource Management Goal

Increase the likelihood that the NPLCC region will continue to support its ecosystems, important species identified by NPLCC partners, and the cultures and livelihoods that depend on these. We [the NPLCC partners] will accomplish this by managing in ways that consider current and projected future climate conditions, thereby contributing to sustainable ecologically-connected landscapes.

Priority Topic C: Effects of changes in sea levels and storms on marine shorelines, the nearshore and estuaries

Inform policy, management decisions, and actions of resource managers to support ecosystem functions and provide for conservation and sustainable cultural, subsistence, recreational and commercial use of coastal resources in light of projected changes in sea level and storm conditions. This will be accomplished through two supporting objectives:

- A. Identify decision-relevant information needs associated with understanding how changes and regional variability in sea levels and coastal storms will affect marine shorelines, nearshore and estuarine processes, habitats, and species.
- B. Where appropriate, develop, support, and/or provide that information to decision-makers in a manner that will be useful for promoting and informing management decisions that: 1) consider projected future sea levels, coastal storms, and coastal erosion changes; and 2) reduce risks to, increase adaptive capacity of, and increase the resilience of coastal marine environments to those changes.

Priority Topic C: Effects of changes in sea levels and storms on marine shorelines, the nearshore and estuaries

Projects funded to date:

- 2011: National Wildlife Federation - Climate Change Effects and Adaptation Approaches in Marine and Coastal Ecosystems of the NPLCC
- 2011: USGS – Humboldt Bay SLR modeling
- 2011: USGS –Predicting vulnerability of nearshore species and habitats to climate change effects
- 2012: Swinomish Indian Tribal Community - Correlation and climate sensitivity of human health and environmental indicators in the Salish Sea
- 2012: CA Parks and Rec - Using TEK to model the effects of climate change and SLR at Tolowa Dunes State Park, CA
- 2012: Organized Village of Kaasan - Determine if climate change can affect the gathering calendar and natural resources of Kasaan Village and nearby Tribes on Prince of Wales Island
- 2013: Friends of the San Juans: Sea level rise adaption tools for San Juan archipelago & Salish Sea
- 2013: USGS - Coastal Ecosystem Response to Climate Change Disseminating Results

Priority Topic C: Effects of changes in sea levels and storms on marine shorelines, the nearshore and estuaries

Inform policy, management decisions, and actions of resource managers to support ecosystem functions and provide for conservation and sustainable cultural, subsistence, recreational and commercial use of coastal resources in light of projected changes in sea level and storm conditions. This will be accomplished through two supporting objectives:

A. Identify decision-relevant information needs associated with understanding how changes and regional variability in sea levels and coastal storms will affect marine shorelines, nearshore and estuarine processes, habitats, and species.

- I. Conduct a review of literature and synthesis of information throughout the entire LCC to assess where and how sea level rise will affect NPLCC coastal ecosystems.
- II. Conduct a needs assessment for datasets, geospatial layers and other information across the range of the NPLCC that will inform near-term conservation and management actions and serve as a baseline for ongoing planning and environmental assessment. (percent done across the geography can count as a measurable)

Priority Topic C: Effects of changes in sea levels and storms on marine shorelines, the nearshore and estuaries

- B. Where appropriate, develop, support, and/or provide that information to decision-makers in a manner that will be useful for promoting and informing management decisions that: 1) consider projected future sea levels, coastal storms, and coastal erosion changes; and 2) reduce risks to, increase adaptive capacity of, and increase the resilience of coastal marine environments to those changes.
 - i. Conduct science-management webinars for at least 75 percent of the NPLCC funded projects related to this priority resource.
 - ii. Provide adaptive learning opportunities by supporting demonstration projects to fully/effectively incorporate current SLR information into management actions (how many and where?)
 - iii. Work with federal, state and tribal land managers and other natural/cultural resource managers in a targeted geographic area on a climate smart landscape conservation design that includes impacts and resource vulnerabilities to sea level rise and/or coastal storms.

Brainstorm

Priority Topic A: Effects of hydrologic regime shifts on rivers, streams, and riparian corridors

Projects funded to date:

- 2011: National Wildlife Federation -Climate Change Effects and Adaptation Approaches in Freshwater Aquatic and Riparian Ecosystems in the NPLCC
- 2012: UW- Mapping Pacific Northwest Riparian Areas: Measuring Current Condition And Prioritizing For Climate Change Adaptation
- 2012: USGS – Prioritizing restoration and enhancement of passage at stream road crossings for aquatic invertebrates in the face of changing hydrologic regimes
- 2013: PSU & USFWS - Using Beaver for Climate Change and Conservation Benefits
- 2014: UW & NOAA - Incorporating Spatial Heterogeneity in Temperature into Climate Vulnerability Assessments for Coastal Pacific Streams
- 2014: Nooksack River Climate Change Vulnerability Assessment, Restoration Planning, and Adaptation Plan
- 2014: WDFW - An Applied Case Study to Integrate Climate Change into Design and Permitting of Water Crossing Structures

Priority Topic A: Effects of hydrologic regime shifts on rivers, streams, and riparian corridors

Inform policy, management decisions, and actions of resource managers to support ecosystem functions and provide for conservation and sustainable cultural, subsistence, recreational and commercial use of rivers, streams, and riparian corridors in light of projected changes in hydrologic regimes. This will be accomplished through two supporting objectives:

A. Identify decision-relevant information needs associated with understanding how changes in hydrologic regimes will affect food webs, aquatic species population dynamics, ecosystem processes, riparian vegetative communities, and hydrologic and geomorphic conditions.

- i. Conduct a needs assessment for datasets, geospatial layers and other information related to water temperature and changes in water quantity across the geographic range of the NPLCC that will inform near-term conservation and management actions and serve as a baseline for ongoing planning and environmental assessment. (percent done across the geography can count as a measurable)
- ii. To assist with a needs assessment, conduct regional workshops (how many?) with local and regional managers, scientists and other stakeholders to identify decision-relevant information needs associated with this priority resource.

Priority Topic A: Effects of hydrologic regime shifts on rivers, streams, and riparian corridors

B. Where appropriate, develop, support, and/or provide that information to decision-makers in a manner that will be useful for promoting and informing decisions that: 1) consider landscape-scale climate-related changes in hydrologic systems: and 2) reduce risk to, increase adaptive capacity of, and increase the resilience of rivers, streams, riparian corridors and their associated biota to those changes.

- I. Develop products, tools, models, datasets to address the regional needs identified under (A)(how do we know when we have done enough?)
- II. Conduct science-management webinars for at least 75 percent of the NPLCC funded projects related to this priority resource.
- III. Work with partners to conduct workshops to transfer information and products to resource managers and other decision-makers that will inform decisions related to increasing adaptive capacity of or increasing the resilience of the identified priority resources.

Brainstorm

Priority Topic B: Effects of change in air temperature and precipitation on Forests

Projects funded to date:

- 2011: UW- Applying Vulnerability Assessment Tools to Plan for Climate Adaptation: Case Studies in the NPLCC
- 2011: University of Montana - North Pacific Forest Landscape Corridor and Connectivity Project: Assessing Landscape and Species Vulnerability
- 2011: TNC - The Washington Connected Landscapes Project: Providing Analysis Tools for Regional Connectivity and Climate Adaptation Planning
- 2011: Conservation Biology Institute - Pacific Northwest Forest Soils: Drought Sensitive Areas
- 2011: PRBO - Current and Future Distribution and Abundance of North Pacific Birds in the Context of Climate Change
- 2012: National Wildlife Federation - Climate Change Effects and Adaptation Approaches for Terrestrial Ecosystems, Habitats, and Species
- 2012: UAK SE - Cross Boundary Data Integration III- Landcover Data
- 2012: Heiltsuk - Implementing ecosystem-based management in the central coast of BC: Support for Heiltsuk participation in strategic landscape reserve design process
- 2013: Geos Institute - Managing Coast Redwoods for Resilience and Adaptation in Changing Climate
- 2014: USFS - Implementing Climate-Smart Resource Management Across Multiple Ownerships in SW Oregon

Priority Topic B: Effects of change in air temperature and precipitation on Forests

Inform policy, management decisions, and actions of resource managers to support ecosystem functions and provide for conservation and sustainable cultural, subsistence, recreational, and commercial use of forest-related resources in light of projected climate-related changes in air temperature and precipitation. This will be accomplished through two supporting objectives:

- A. Identify decision-relevant information needs associated with understanding how climate-driven temperature and precipitation changes will affect forest plant and animal species, including community level attributes such as trophic webs, keystone relationships, and distribution of co-evolved plant species.
 - i. Conduct a review of literature and synthesis of information to assess how climate-driven temperature and precipitation changes will affect NPLCC forest ecosystems.
 - ii. Conduct a needs assessment for datasets, geospatial layers and other information across the range of the NPLCC that will inform near-term conservation and management actions and serve as a baseline for ongoing planning and environmental assessment. (percent done across the geography can count as a measurable)

Priority Topic B: Effects of change in air temperature and precipitation on Forests

- A. Where appropriate, develop, support, and/or provide that information to decision-makers in a manner that will be useful for promoting and informing management decisions that: 1) consider landscape-scale climate-related changing forest conditions" and 2) reduce risk to, increase adaptive capacity of, and increase the resilience of forest ecosystems to those changes.
 - i. Conduct science-management webinars for at least 75 percent of the NPLCC funded projects related to this priority resource.
 - ii. Develop products, tools, models, datasets to address the regional needs identified under (a)(how do we know when we have done enough?)
 - iii. In a targeted geographic area, work with federal, state and tribal forest managers and other natural/cultural resource managers to identify vulnerabilities and develop climate adaptation strategies for valued natural and cultural resources.

Brainstorm

Priority Topic D: Effects of changes in the hydrologic regime on anadromous fish

Inform policy, management decisions, and actions of resource managers to support healthy populations of anadromous fish species and provide for conservation and sustainable cultural, subsistence, recreational, and commercial use of those resources in light of projected changes in hydrologic regimes. This will be accomplished through two supporting objectives:

- A. Identify decision-relevant information needs associated with understanding how changes in hydrologic regimes will affect anadromous fish habitats, life histories, and population dynamics.
- B. Where appropriate, develop, support, and/or provide that information to decision-makers in a form that will be useful for promoting and informing management decisions that: 1) consider landscape-scale climate related changes in hydrologic systems; and 2) reduce risk to, increase adaptive capacity of, and increase the resilience of anadromous fish populations to those changes.

Projects funded to date:

2013 USFWS - Climate Change Vulnerability Assessment of Pacific Lamprey

2013: Chilkoot Indian Association - Identifying Climate Vulnerabilities and Prioritizing Adaptation Strategies for Eulachon populations in the Chilkoot and Chilkat Rivers and the application of local monitoring systems

2013: CRITFC - A Coupled (Ocean and Freshwater) Assessment of Climate Change Impacts on Pacific Lamprey and Pacific Eulachon

2014: USFS - Developing a comprehensive interagency stream temperature database and high-resolution NorWeST climate scenarios for the NPLCC

Brainstorm

Priority Topic E: Invasive species, diseases, pests and their effects on biological communities

Inform policy, management decisions, and actions of resource managers to support healthy biological communities and provide for conservation and sustainable cultural, subsistence, recreational and commercial use of those resources in light of projected climate-related expansion of invasive species, diseases, and pests. This will be accomplished through two supporting objectives:

- A. Identify decision-relevant information needs associated with understanding understand how projected climate-related changes in invasive pathogens, parasites, plant or animal or species will affect aquatic and terrestrial biological communities.
- B. Where appropriate, develop, support, and/or provide that information to decision-makers in a manner that will be useful for promoting and informing decision that: 1) consider climate-related changes in invasive species, diseases, and pests; and 2) reduce risk to, increase adaptive capacity of, and increase the resilience of biological communities to those changes.

Priority Topic E: Invasive species, diseases, pests and their effects on biological communities

Projects funded to date:

- 2013: Chugachmiut Tribal Consortium - Berry Risk Mapping & Modeling of Native & Exotic Defoliators in Alaska
- 2014: Cross-boundary Planning for Resilience and restoration of Endangered Oak Savannah and Coastal Douglas-fir Forest Ecosystems

Brainstorm