



Expanding ecosystem service considerations in Olympic Coast National Marine Sanctuary

Katie Wrubel, Resource Protection Specialist,
Olympic Coast National Marine Sanctuary
katie.wrubel@noaa.gov

OLYMPIC COAST NATIONAL MARINE SANCTUARY



- Established in 1994
- 3,188 sq. mi. of marine waters
- Extends 25 to 45 miles seaward, covering much of the continental shelf and parts of submarine canyons
- Within usual and accustomed fishing areas of four Coastal Treaty Tribes

COASTAL TREATY TRIBES



- Hoh Tribe, Makah Tribe, Quileute Tribe, and Quinault Indian Nation
 - 1855 Treaty of Neah Bay
 - 1856 Treaty of Olympia
- Government-to-government relationship and engagement since designation
- Co-managers of the marine resources with the state and federal agencies
 - Boldt Decision (1974) & subsequent court cases
- Tribal seats on SAC
- Intergovernmental Policy Council created in 2007

Condition Report → Climate → MPR



OCNMS management planning process:

- ✓ Step 1 –Condition Report (2008-2019) - Published March 2022
- ✓ Step 2 –Climate Vulnerability Assessment - To be published early 2025
 - Step 3 – Management Plan Review - Initiated public scoping in 2023

	2019	2020	2021	2022	2023	2024	2025
Condition Report							
Climate Vulnerability Assessment							
Management Plan Review							



Condition Report: assess **current** condition of resources by looking back

Vulnerability Assessment: assess **future** condition of resources using current conditions + projected climate change impacts

Climate-informed management plan with actions and strategies that directly address the CR/VA information

Condition Report - Purpose and Audience

- Apply consistent framework to assess the status and trends of resources and habitats
- Assess human connections and 'ecosystem services' (benefits provided to humans)
- Identify data gaps and data analysis needs to guide future research
- Present data and information for assessing future vulnerability to climate change
- Provide partners and members of the public with data, information and resources to support an upcoming process to review the **Sanctuary Management Plan**

Ecosystem Services



Cultural (*non-material benefits*)

- Heritage
- Non-consumptive recreation
- Consumptive recreation
- Science
- Education
- Sense of Place

Provisioning (*material benefits*)

- Commercial harvest
- Subsistence harvest
- Ornaments

Good	Demand for the service is being met at a sustainable level.
Good/Fair	Demand for the service is not fully met, but performance is acceptable and may not warrant enhanced management.
Fair	The ability to meet demand for the service is compromised, and existing management would require enhancement to enable acceptable performance.
Fair/Poor	The ability to meet demand for the service is compromised, and it is unclear whether new or enhanced management would restore it.
Poor	Demand for the service is not being met and it is doubtful that new or enhanced management would restore it.

Subsistence Harvest



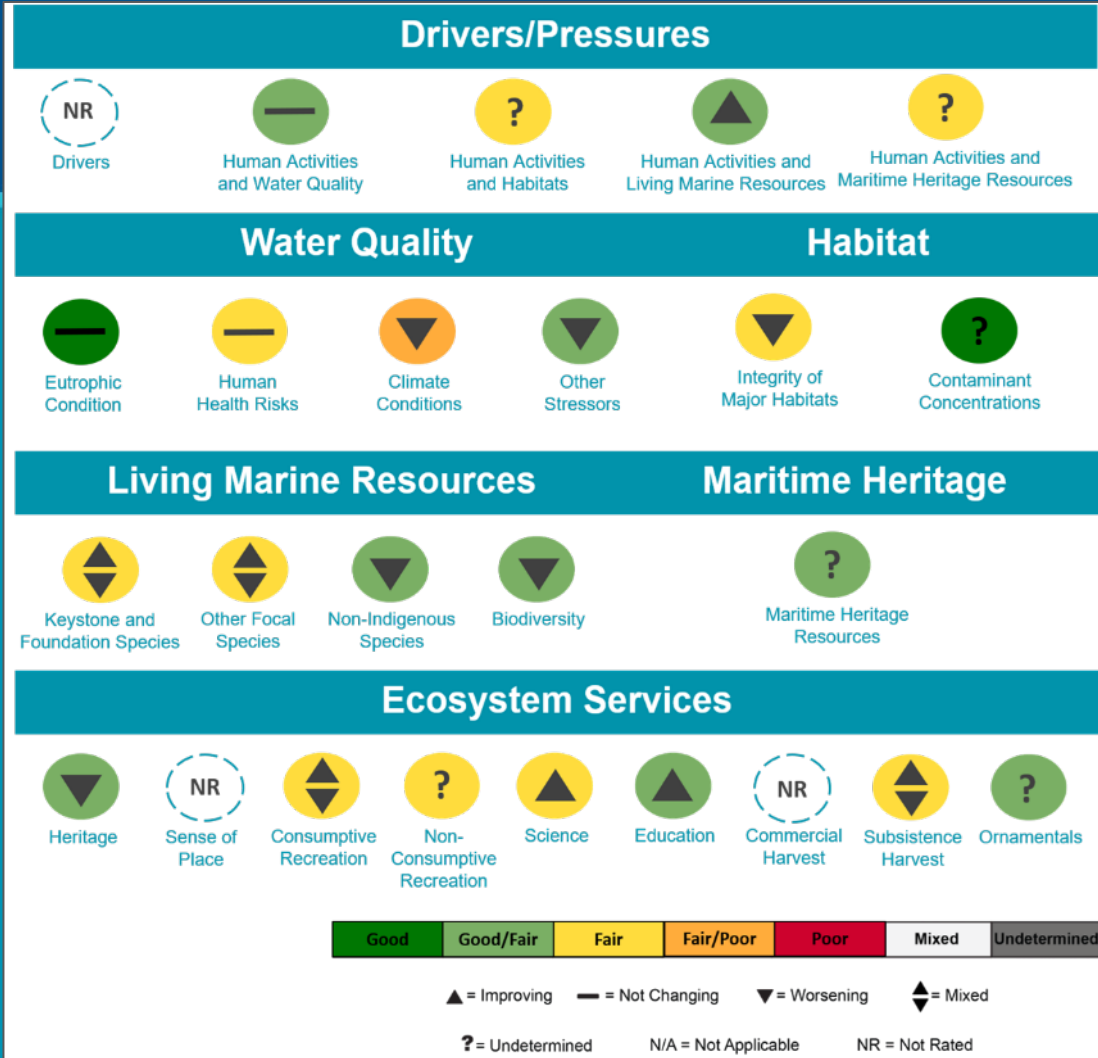
- No economic data
- Many species still used for subsistence by tribes
 - 27 inverts, 34 fish, 8 marine mammals, 6 kelp/algae, 9 birds
- Tribal and non-tribal species retention
- Mixed trends of indicator species

Key Messages

Climate change impacts represent the biggest threats to Olympic Coast habitats, resources, and ecosystem services

Ecosystem services are fair or in good condition. Some services were not rated given nuances in perspectives

- Sense of Place
- Commercial harvest



Olympic Coast NMS: Condition Report Process

Olympic Coast National Marine Sanctuary adapted the Condition Report assessment framework in order to better meet the needs of the *Olympic Coast* community

- Better represented the *reciprocal* relationship of humans and the environment
- Included Indigenous voices and perspectives
- Engaged tribal partners early and often, with dedicated support for staff time and travel
- Built in time for additional tribal reviews
- Refined and enhanced Ecosystem Service concepts

“The hard work accomplished on the Olympic Coast is helping tremendously at other sites, especially where Indigenous people are important sanctuary partners...”

Photo: Larry Workman

CVA Working Group

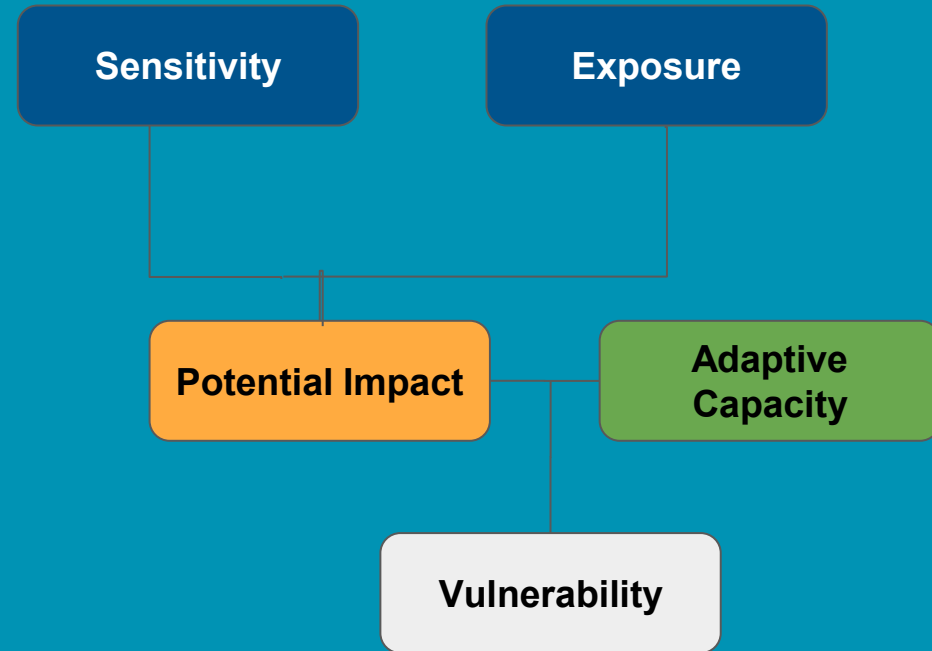


- SAC Working Group - 21 members
- Focal Resources - 66
 - 6 Habitats, 11 Ecosystem services, 46 species, 3 maritime heritage resource areas
 - Leverage other resources (NMFS CVAs for fish and marine mammals, OCNMS condition and climate reports, partner efforts)
 - Worked with the Coastal Treaty Tribes
- Modified EcoAdapt/GFNMS worksheets

Climate Vulnerability Assessment



- Sensitivity
 - Climate
 - MHW, OAH, HABs, storms
 - Non-climate factors
 - Vessel traffic, pollution, marine debris, trampling
- Exposure
 - ~2050 target
- Adaptive Capacity
 - Focal resource ability (genetic diversity, life history strategies, disturbance regimes, etc.)
 - Management strategies



Socio-ecological systems



Ecosystem Services



Cultural (*non-material benefits*)

- Sense of Place & Heritage
- Non-consumptive recreation
- Consumptive recreation
- Science
- Education

Provisioning (*material benefits*)

- Commercial harvest
- Subsistence harvest
- Ornaments

Regulating

- Flood and erosion control
- Carbon storage and sequestration

Intermediate Services

- Food web productivity
- Marine management and stewardship

HABITATS, SPECIES, ECOSYSTEM SERVICES, AND HERITAGE RESOURCES ASSESSED



		Adaptive Capacity				
		Low	Low-Moderate	Moderate	Moderate-High	High
Risk	Low				Lingcod Petrale Sole	
	Low-Moderate			Mussels Razor clams Anchovy HAB ¹ species	Dungeness Crab Gooseneck barnacles Black Rockfish Halibut Sablefish Pinnipeds Science	Pacific Whiting
	Moderate		Deep sea corals & sponges Sunflower star	Beach Habitats Eulachon Yelloweye Rockfish Sea otter Fin whale Offshore MHR ²	Shallow Seafloor Habitat Ochre star Transient killer whale Humpback Whale Gray whale Carbon sequestration	
	Moderate-High		Southern Resident Killer whale Tufted puffin Nearshore MHR ²	Benthic Habitat Urchins Olive snails Herring Salmon Sand Lance Black oystercatcher Common murre	Pelagic habitat Kelp forests Rocky Intertidal Zooplankton Commercial Harvest Education Flood & Erosion Control Food Web Productivity Marine Management Terrestrial MHR ²	
	High			Marbled murrelet	Subsistence Consumptive Rec ³ Non-Consumptive Rec ³	



Ecosystem Services



- Subsistence harvest, Consumptive and non-consumptive recreation
- Highest vulnerability of ecosystem services
- Climate change is expected to impact:
 - Species utilized for subsistence (shell thinning, distribution, timing)
 - OA, temp, hypoxia
 - Access - roads, ports, beaches
- Adaptive Capacity
 - Indigenous Knowledge systems
 - If cannot access, trade options

Conclusions



- OCNMS benefitted from working closely with the Coastal Treaty Tribes in our assessments → informs our management decisions
 - Exploring interest in developing biocultural indicators
- Limitations on assessing ecosystem services from Indigenous perspectives
- Draft Management Plan for public comment in 2025

Office of National Marine Sanctuaries
National Oceanic and Atmospheric Administration



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