

Science, Service, Stewardship



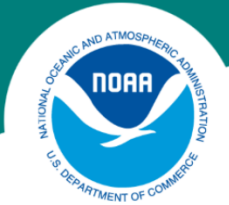
Crediting/Debiting Tools for Estuarine Habitat in Washington State

- 1) The Nearshore Habitat Values Model**
- 2) Hood Canal Nearshore Interim Tool**

December 7, 2020

Stephanie Ehinger NMFS WCR
Stephanie.Ehinger@noaa.gov

**NOAA
FISHERIES
SERVICE**



Puget Sound Nearshore Conservation Calculator

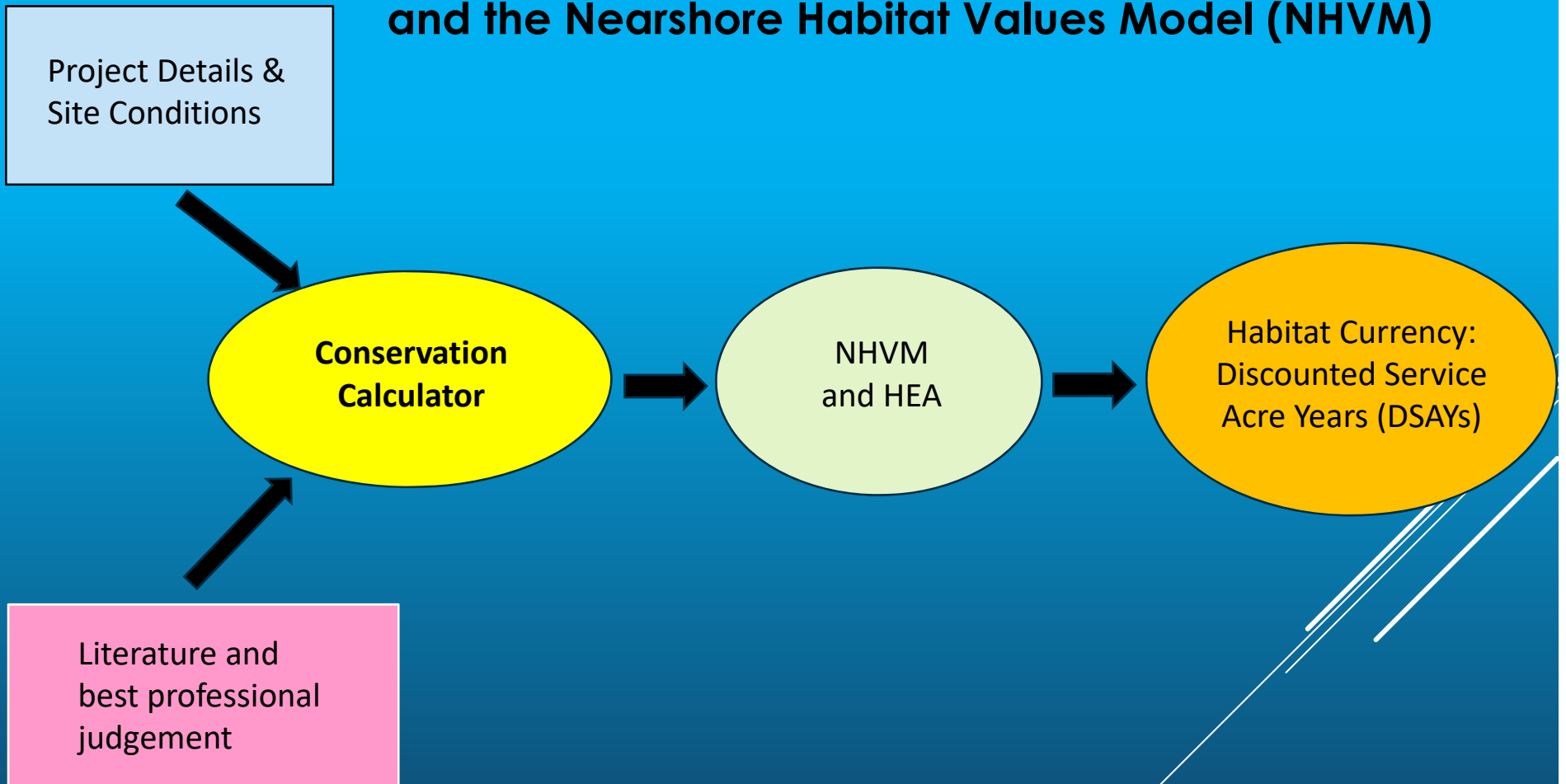
Development Goals and Sideboards:

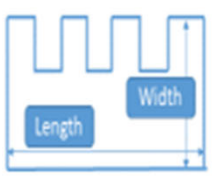

1. Function/Service based evaluation tool
2. Capitalize on NOAA's success using existing methods
3. Limited staff for development
4. Evaluate impacts specific to ESA consultations
5. Target species and habitat: Listed critical habitat for juvenile Puget Sound Chinook and Hood Canal summer run chum.
6. Target users: Agency staff & consultants
7. Full Transparency: Spreadsheet model every user could review
8. Data Moderate: Limit input parameters to data the agencies get as part of ESA consultation packages.



PUGET SOUND NEARSHORE CONSERVATION CALCULATOR

**Easy Interface to Habitat Equivalency Analysis (HEA)
and the Nearshore Habitat Values Model (NHVM)**



A	B	C	D	E	F	H				
Impact and Benefit Determination for Overwater Structure Elements										
To expand an entry block for data entry click on the + sign on the left. Clicking the 2 will expand all entry blocks.				Version:	11/5/2020					
Entry Block I: Overwaterstructure Entry for New or Expansion Overwater Structure Elements										
Enter new overwater structure elements in this entry block and all areas that are considered expansions with replacements. Enter replacement overwater structure elements in Entry block II below.										
SAV	Must enter vegetation scenario for LSZ (See Table 1 on "Summary" Tab)	Enter LSZ SAV scenario 0-3	0	Reference: LSZ SAV Scenarios	Addition of USZ vegetation scenarios planned for next version					
Pier and Ramp to be Installed	Description Enter dimensions of elevated pier and ramp in respective shore zone. If a pier has partial grating, enter dimensions of grated and ungrated portions into respective fields. Enter central portions of piers wider than 40 feet as floats as there is little side lighting in such structures. Reference: Delineation of Shore Zones	OWS Element	Units	Quantity	Total Conservation Debits	Notes and Examples				
		Pier & Ramp USZ fully grated	SqFt	100	-2.48	To account for the dark center on wide decks, enter the deck area within 20 feet from the edge as pier, and enter the deck area more than 20 feet from the edge as a float. See Figure below. FYI: Forage fish credit factors do not apply to piers and ramps.				
		Pier & Ramp USZ solid	SqFt	100	-3.40					
		Pier & Ramp LSZ fully grated	SqFt	100	-3.05					
		Pier & Ramp LSZ solid	SqFt	100	-4.18					
		Pier & Ramp DZ fully grated	SqFt	100	-1.10					
Pier & Ramp DZ solid	SqFt	100	-1.83							
Piles	Piles can be steel, concrete, plastic, untreated wood or, outside of DNR land, ACZA-treated and urea coated piles. Installation of creosote wood is not included. Use pile calculator below to determine average pile diameter.	Enter number of piles in USZ		1	-1.00	Figure by Lee Carum (USFWS)				
		Enter average diameter of piles in USZ.	[inches]	12	-1.00					
		Enter number of piles in LSZ		1	-1.00					
		Enter average diameter of piles in LSZ.	[inches]	12	-0.49					
		Enter number of piles in DZ		1	-0.49					
Grated Float to be Installed	Enter the length and width of the float in the appropriate shore zone (see Table 2). For complex floats, enter longest outside dimensions of float. See Example Complex Float 1	USZ Outside dimensions of new float or expanded portion of float.	Length [feet]	10	Enter length and width of floats for buffer determination. For complex floats, enter the sum of the length of each float and the average width of the floats. Set length and width to 0 for zones where no structure present. Reference: Complex Floats					
			Width [feet]	10						
		LSZ Outside dimensions of new float or expanded portion of float.	Length [feet]	10						
			Width [feet]	10						
		DZ Outside dimensions of new float or expanded portion of float.	Length [feet]	10						
			Width [feet]	10						
	The area of the float in each respective shore zone is calculated from length and width entered above. For complex floats, the user should directly enter the square footage of the float in the appropriate zone. BMP: Floats should not be located in the USZ and cannot ground out.	Grated Float USZ	SqFt	100	-11.55	Example Complex Float 1				
		Grated Float LSZ	SqFt	100	-13.97					
		Grated Float DZ	SqFt	100	-5.56					
	Solid float have higher adverse effects on the nearshore environment compared to grated floats. We highly encourage applicants to grate overwater structures as much as possible	USZ Outside dimensions of new float or expanded portion of float.	Length [feet]	10	Enter length and width of floats for buffer determination. For complex floats, enter the sum of the length of each float and the average width of the floats. Set length and width to 0 for zones where no structure present.					
Width [feet]			10							
Summary	ProjectD	RZ	Overwater Structures	ShorelStab	MDredging	BoatR, Jetty	Beach N	Ref.	shorel Stabiliz USZ install	OWS Lookup Tabl



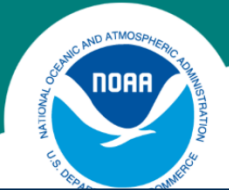
Why Habitat Equivalency Analysis (HEA)?

- HEA meets our identified needs for a habitat assessment tool
- HEA has been used by NOAA's Restoration Center for 25 years
- HEA is peer reviewed
- Ports in Puget Sound are used to HEA

Habitat Equivalency Analysis: An Overview

*Damage Assessment and Restoration Program
National Oceanic and Atmospheric Administration
Department of Commerce*

**March 21, 1995
(Revised October 4, 2000 and May 23, 2006)**



Habitat Equivalency Analysis Concept

Service - to – Service comparison

Ecological Equivalency: Restored habitat to provide equivalent functions (not necessarily same type of habitat) lost at a different location.

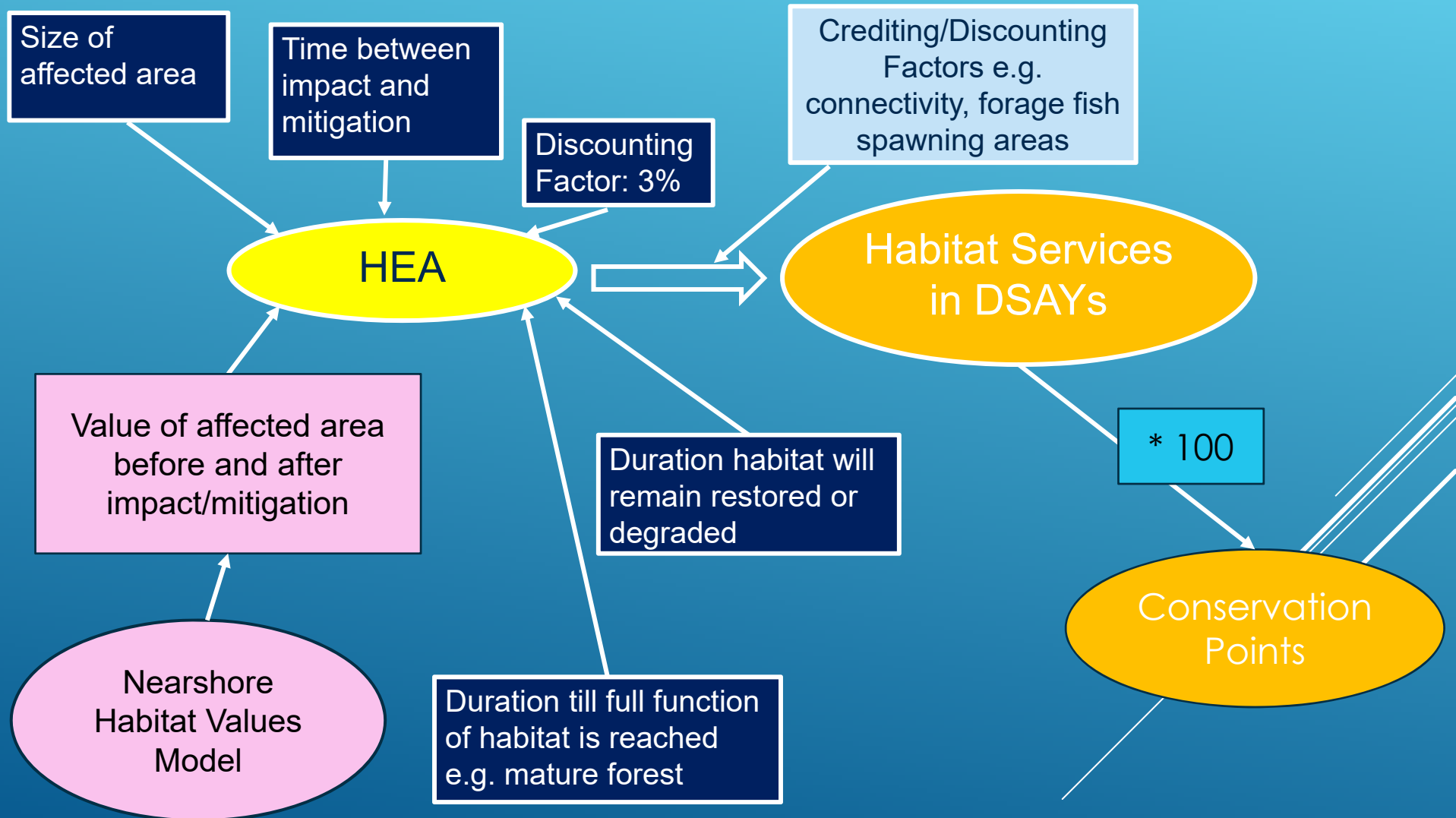


?

=



HABITAT EQUIVALENCY ANALYSIS: THE BASICS



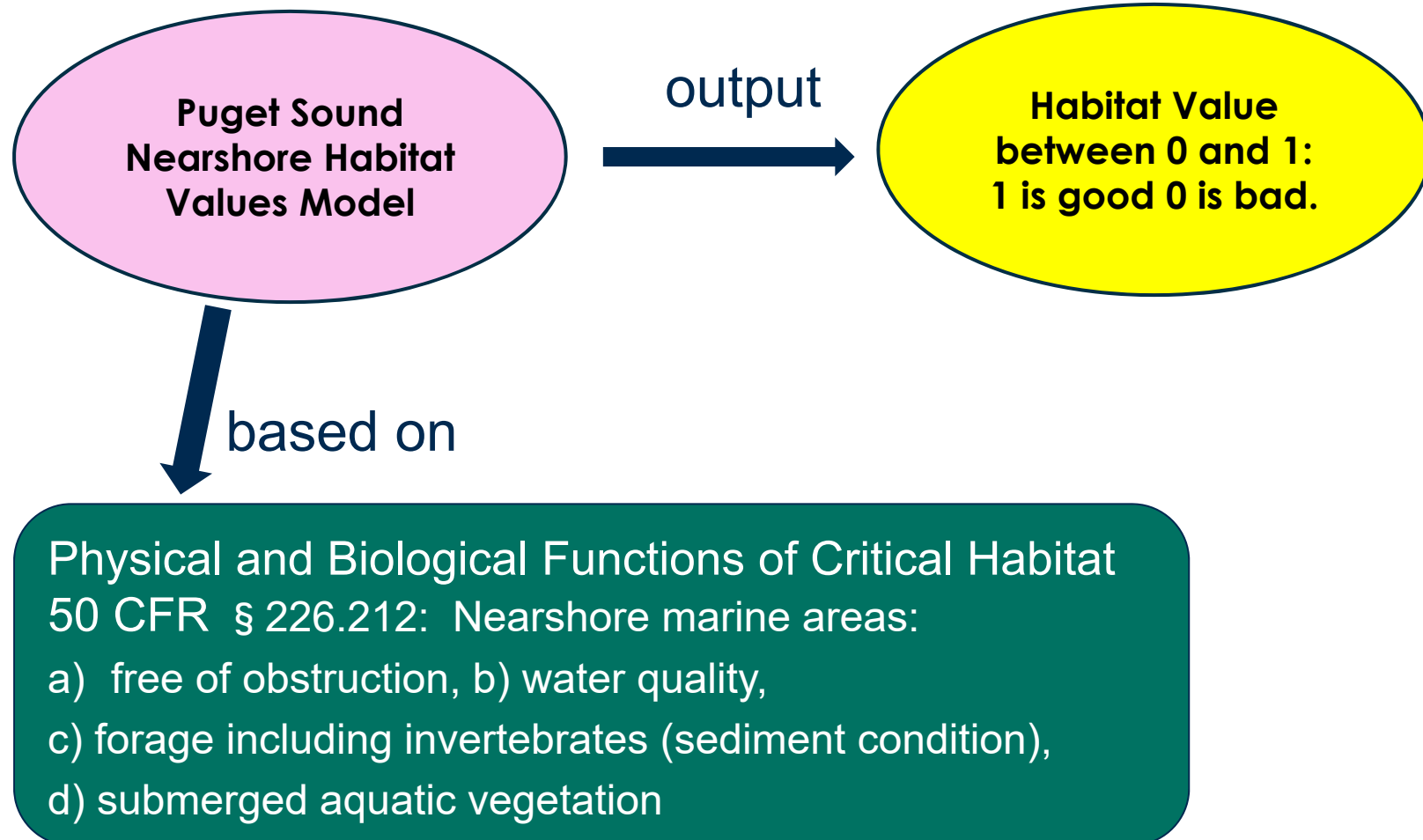


Habitat Values

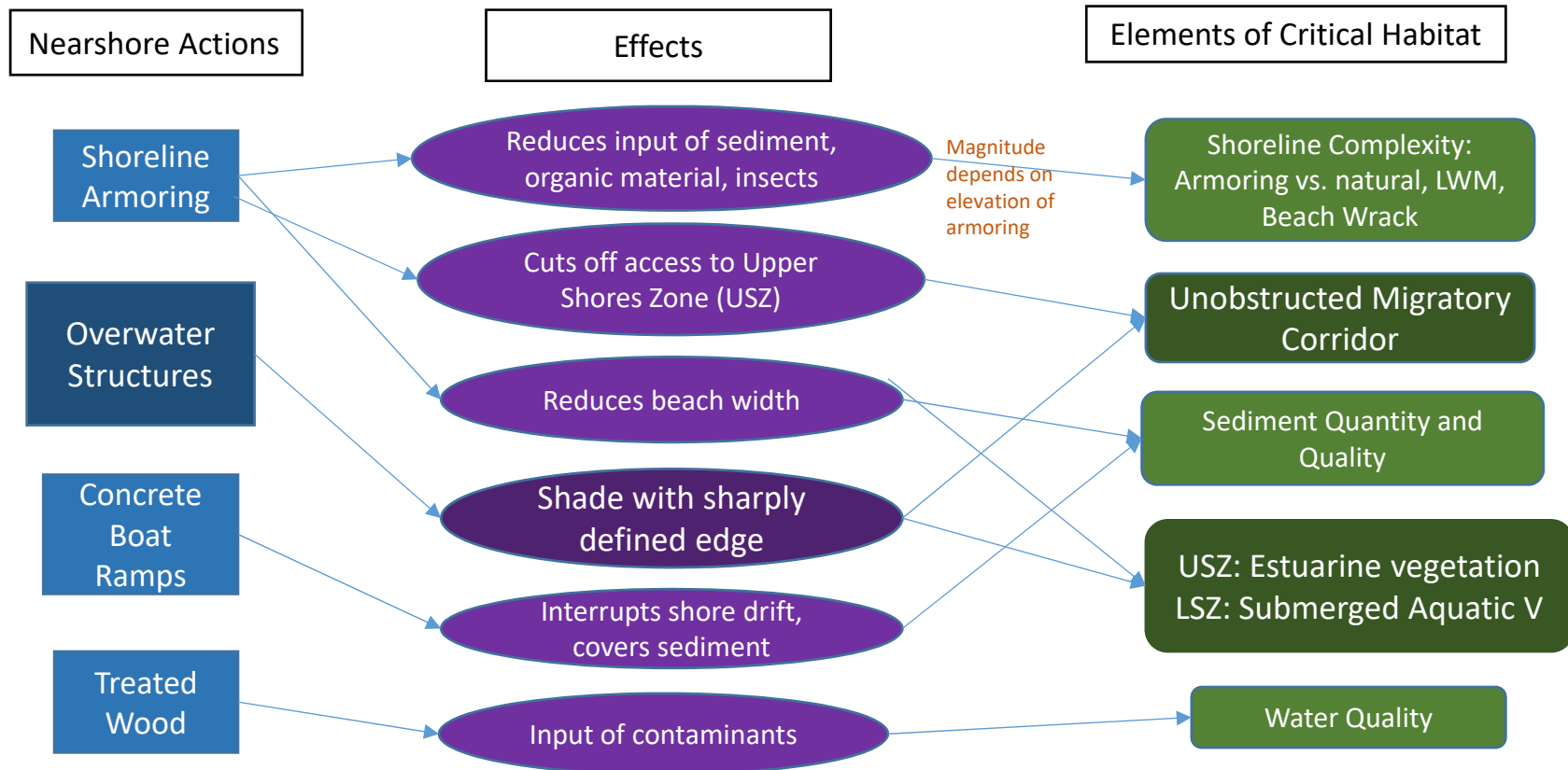
- Habitat values are essential input to HEA
- Habitat Values need to be determined consistently for HEA to give credible results
- Habitat values for HEA range between 0-1; 1 highest value
- In Puget Sound, NMFS developed the Nearshore Habitat Values model to consistently determine habitat values for HEA



Nearshore Habitat Values Model

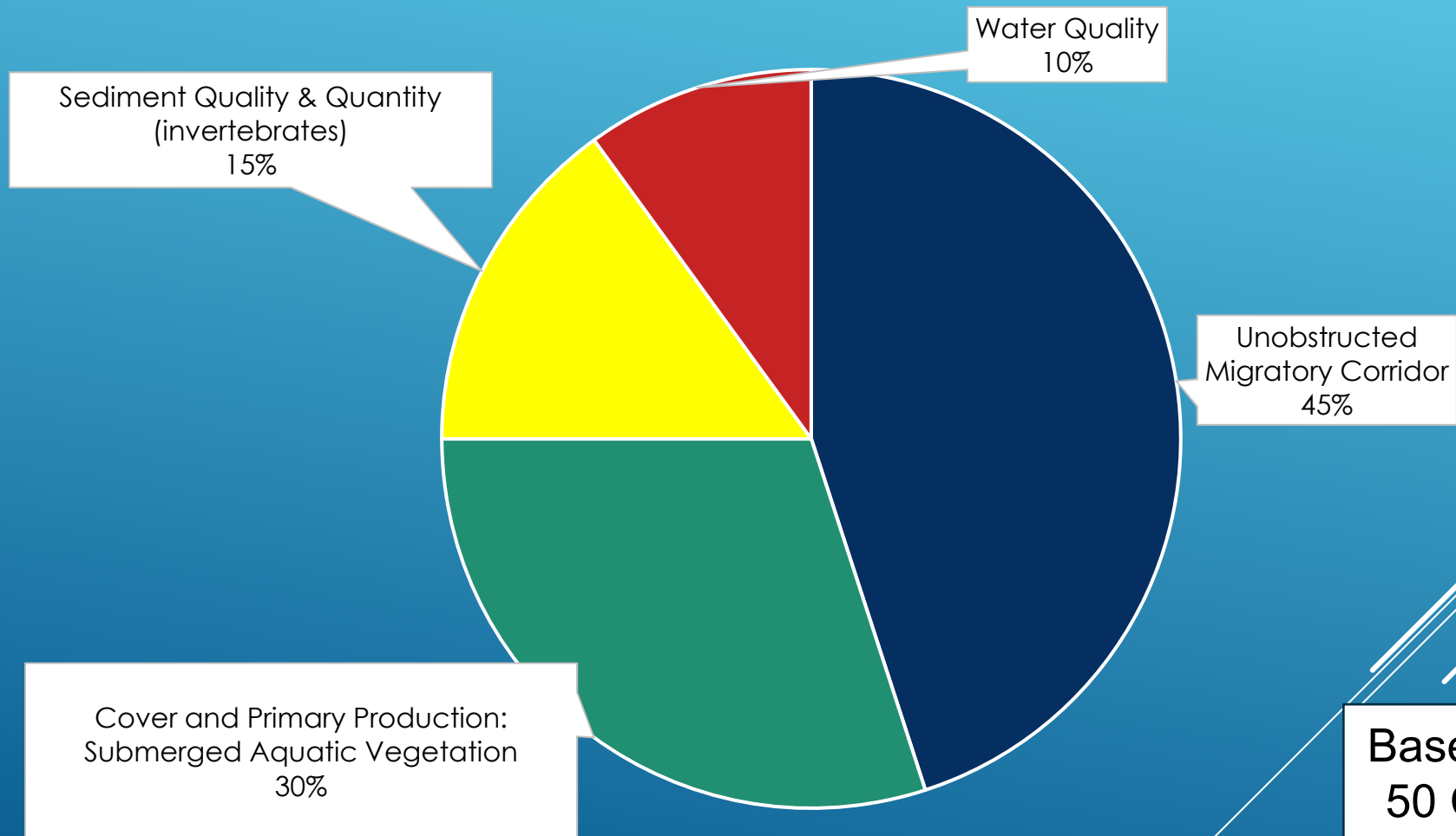


Nearshore Habitat Values Model Concept



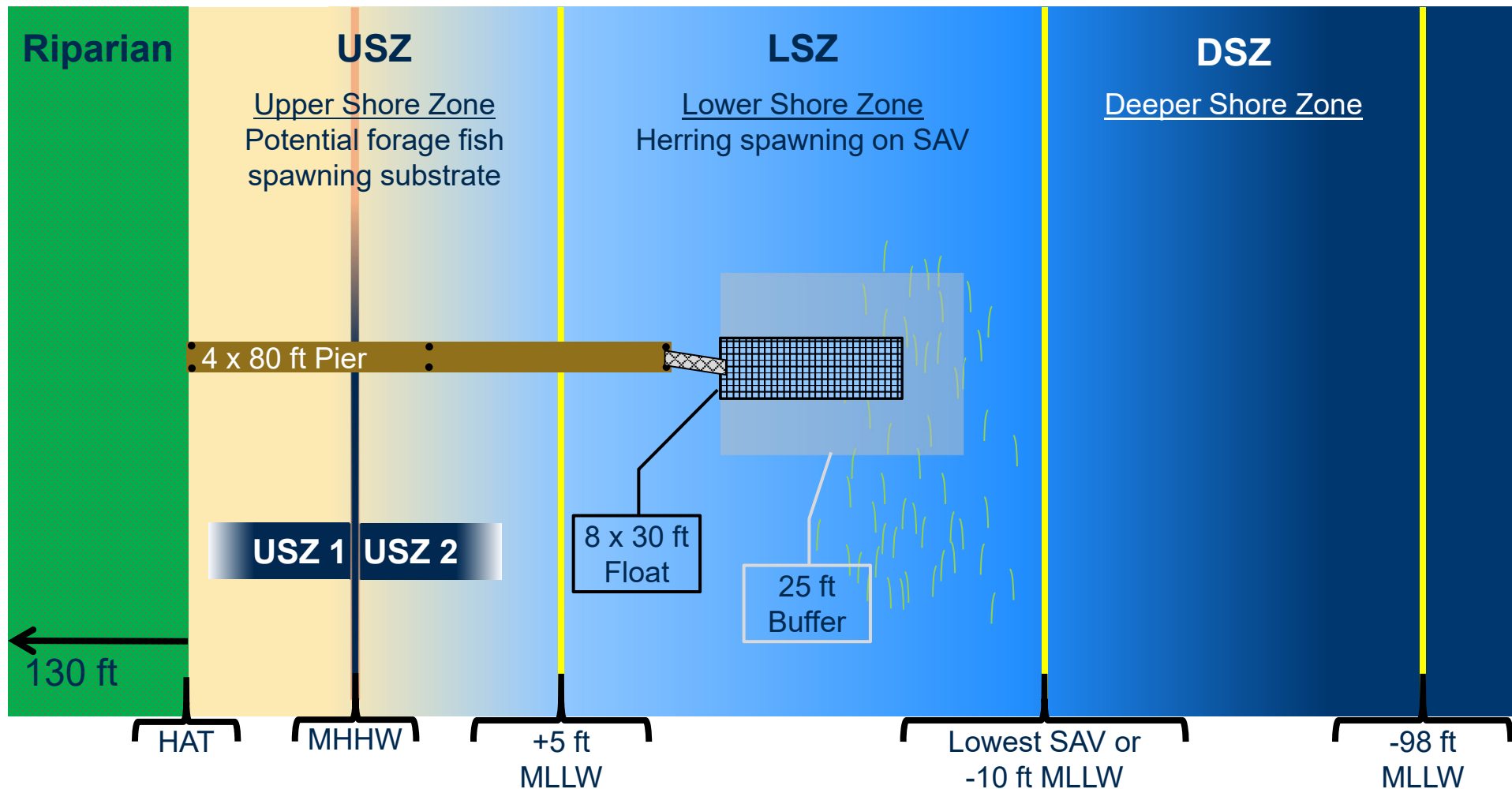
PHYSICAL AND BIOLOGICAL FUNCTIONS IN THE LSZ

Percent contribution to overall max habitat value

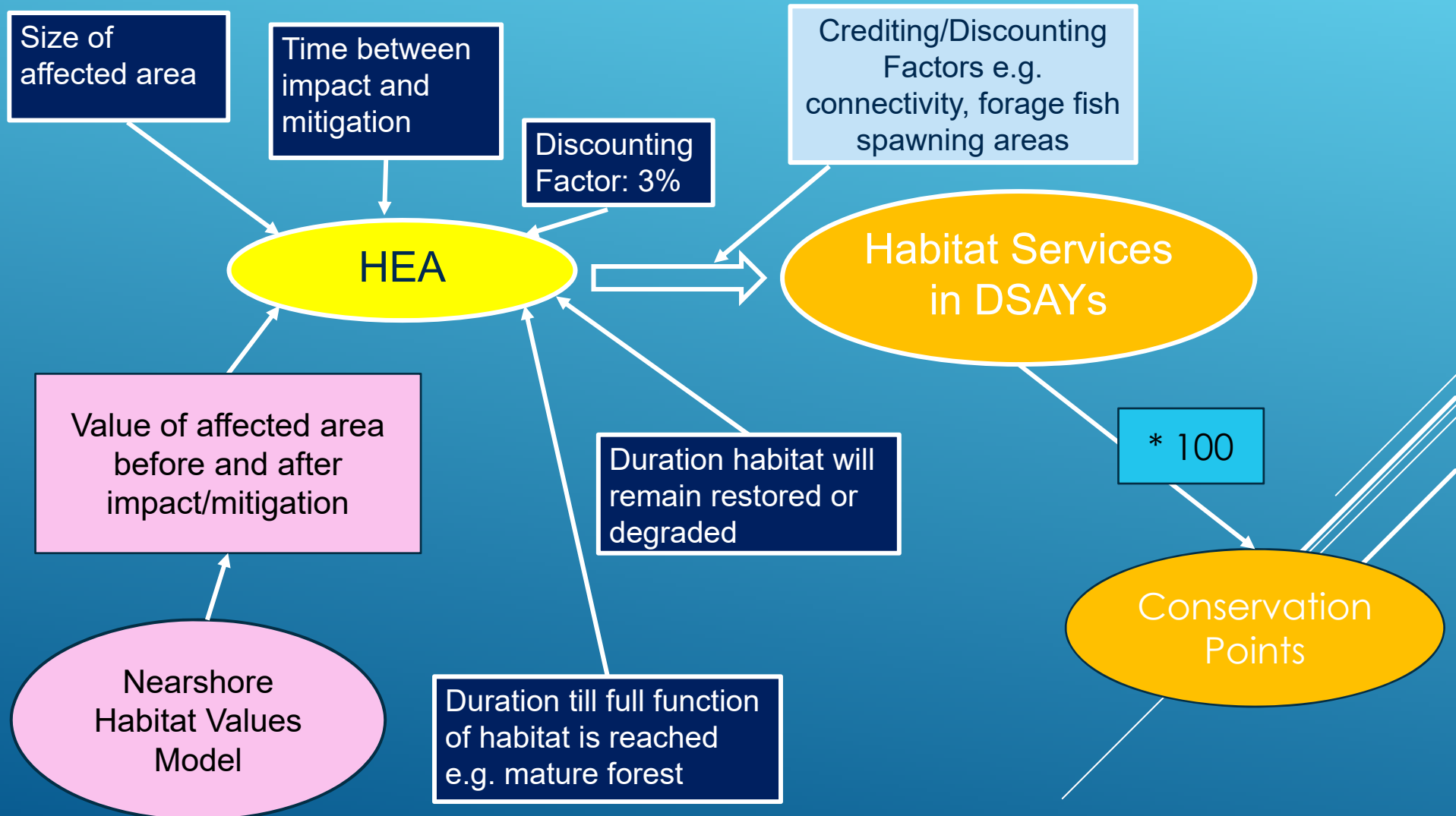


Based on
50 CFR
§226.212

Nearshore Zones



HABITAT EQUIVALENCY ANALYSIS: THE BASICS





Credit Factors: Concept for Application

Landscape-scale credit factors are applied to entire debit/credit:

- Affected area is within 5 miles of natal estuary.
- Affected Area is within pocket beach.
- Affected Areas is at bluff backed beach.

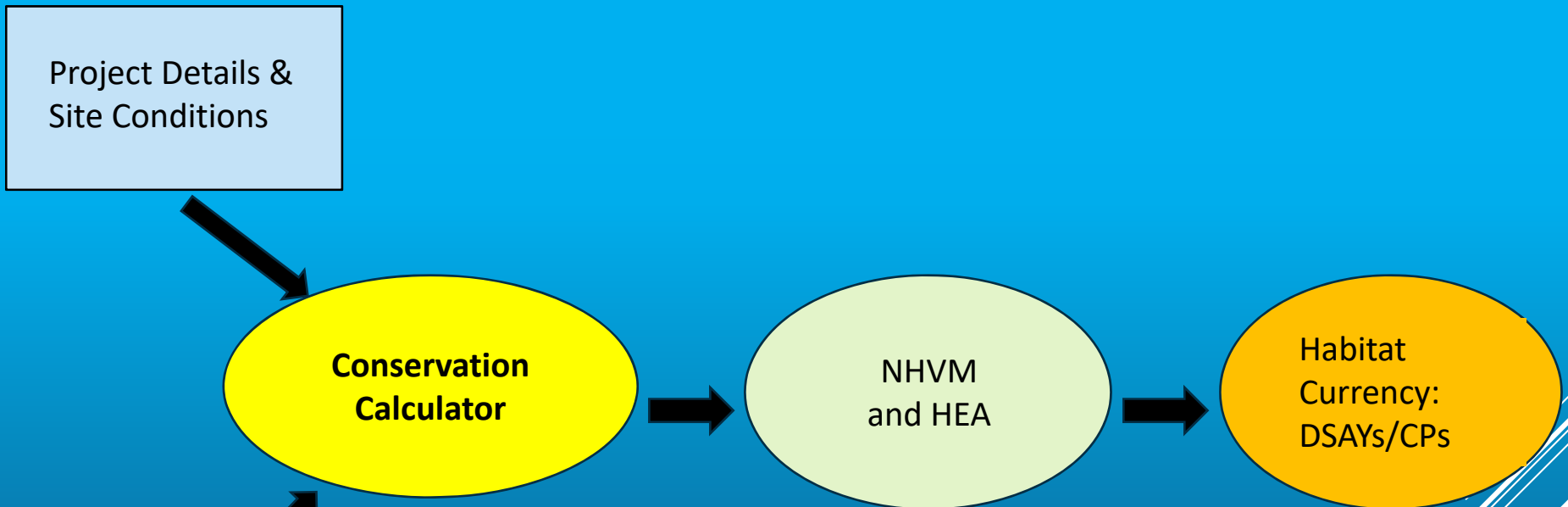
Credit factors applied ala cart to structural elements that impact them:

- Sand lance or surf smelt spawning
- Herring spawning



CONSERVATION CALCULATOR

Easy Interface to Habitat Equivalency Analysis (HEA)
and the Nearshore Habitat Values Model (NHVM)



Literature and
best professional
judgement

Summary Points:

- The NHVM provides an input parameter, the habitat value, for the HEA.
- The NHVM assesses habitat based on physical and biological functions as described in the FR.
- The HEA is a model that uses area, function, and time.



Conservation Calculator on NOAAs Webpage

- **NOAA Web Page includes:**
- Conservation Calculator - downloadable
- On-line User Guide to Conservation Calculator
- Subject information and Links
- Information on where to obtain off-site conservation credits
- Links to conservation credit providers
- Link to the Puget Sound Partnership (state agency that coordinates salmon recovery) who provide conservation credits in all of Puget Sound.

<https://www.fisheries.noaa.gov/west-coast/habitat-conservation/puget-sound-nearshore-habitat-conservation-calculator>



HABITAT CONSERVATION

Puget Sound Nearshore Habitat Conservation Calculator

Online tool draws on latest habitat research to help offset impacts on species.

West Coast

Table of Contents

- [Avoiding Further Loss](#)
- [A Conservation Calculator to Determine Habitat Impacts](#)
- [Working Together on Solutions](#)
- [Conservation Credit Providers and Salmon Recovery Resources](#)

A priority in Puget Sound is the conservation of nearshore habitat, including wetlands, estuaries, and tidal zones that make up some of the most valuable habitat for the region's salmon and steelhead.

Endangered Southern Resident killer whales depend on these salmon for prey, making this habitat important for the whales also. Nearshore habitat is also a keystone of the regional economy, supporting fishing, shellfish farming, tourism, and more.

Unfortunately, most nearshore habitat in Puget Sound is gone, with more than 90 percent of tidal wetlands lost to development. That leaves salmon without essential nursery habitat they need to feed and grow strong to boost their later survival in the open ocean. This is especially concerning for Puget Sound Chinook salmon, which is listed as threatened under the Endangered Species Act.

Further loss of nearshore habitat increases the risk of extinction, eroding species' chances of recovery. The region has addressed other major threats to salmon by improving fish passage past dams, reducing fishing pressure, and adapting fish hatchery practices to help conserve imperiled populations. The continued loss of nearshore habitat, so closely tied to salmon survival, remains the single greatest risk to listed Puget Sound Chinook salmon.

Avoiding Further Loss

Those working to develop and maintain projects in the nearshore, such as marinas and docks which impact this habitat in Puget Sound, have options to pursue their projects without further degrading the crucial shoreline habitat overall. They can pursue conservation offsets through a habitat conservation bank.

[Read more about conservation banks and similar habitat conservation approaches used on the West Coast >](#)

Recovery plans developed under the Endangered Species Act for listed salmon and steelhead in Puget Sound call for protecting and restoring nearshore habitat. However, the first step is to avoid further losses as shoreline development and maintenance projects continue to support the region's growth and economy.

Hood Canal ILF Nearshore Interim Tool



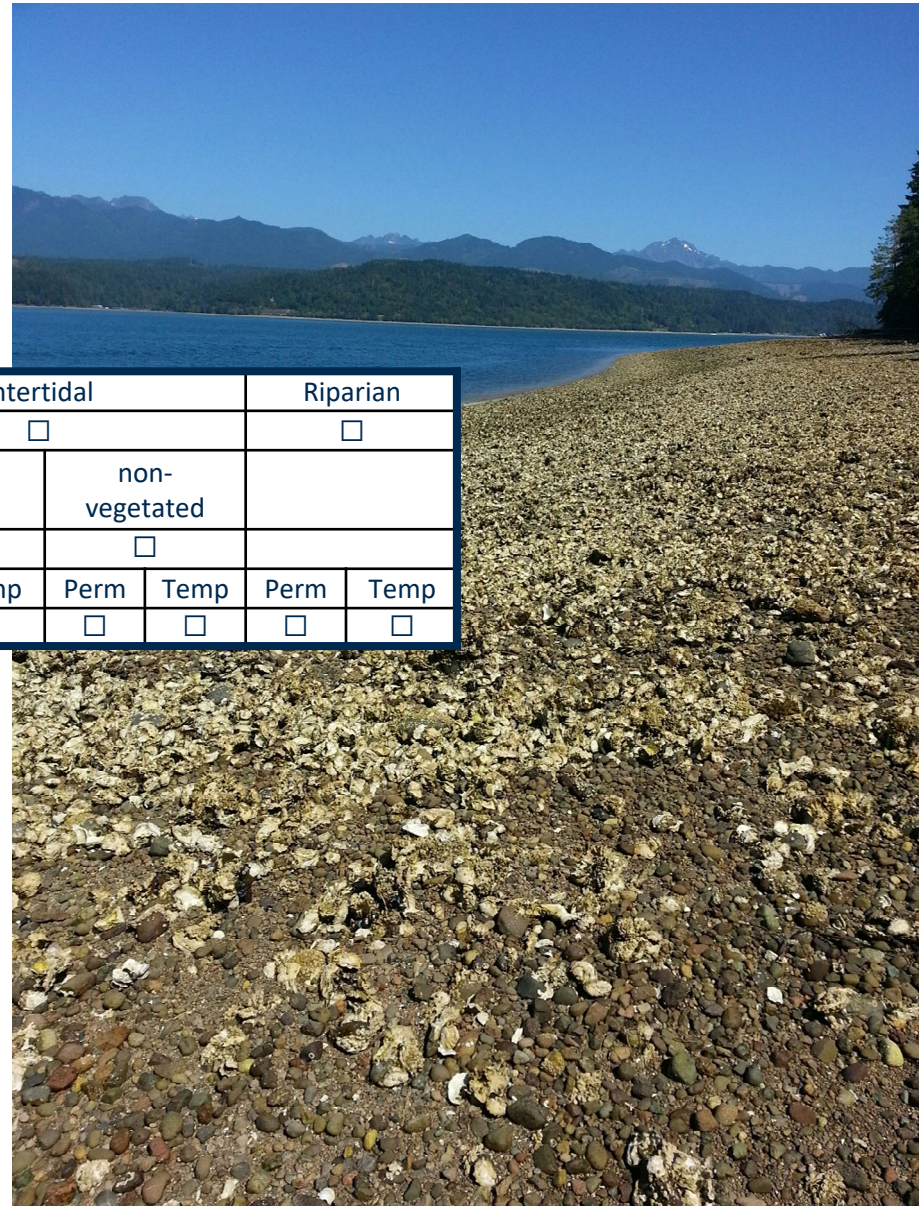
Based on:

- The Type and Amount of Habitat being impacted by the development project;
- The Degree of Impact associated with the development project;
- The Risk of being able to effectively replace the functions and to do so in a timely manner;
- Science and expert opinion.

Little Anderson Eelgrass
Picture provided by Patty Michak (HC ILF)



Hood Canal ILF Nearshore Interim Tool



<i>SYSTEM</i>	Subtidal		Tidal Wetland		Intertidal				Riparian			
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>				<input type="checkbox"/>			
<i>SUBCLASS</i>	vegetated	non-vegetated				vegetated		non-vegetated				
	<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>		<input type="checkbox"/>				
<i>DURATION</i>	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- Degree of impact: Duration and Intensity
- Risk Factors incl. forage fish
- Quality of Habitat
- Habitat Connectivity

Little Dewatto
Picture provided by Patty
Michak (HC ILF)

**Differences:
Hood Canal ILF Nearshore Interim Tool &
Conservation Calculator**

Conservation Calculator

- Focused on salmonid habitat
- Expert opinion frontloaded, part of NHVM
- User friendly calculator
- Output: DSAYs (habitat \$)

HC ILF Nearshore Interim Tool

- Focus entire ecosystem
- Expert opinion needed for each project evaluation
- Tool not intended for project applicant use
- Output: Habitat Class Acres

