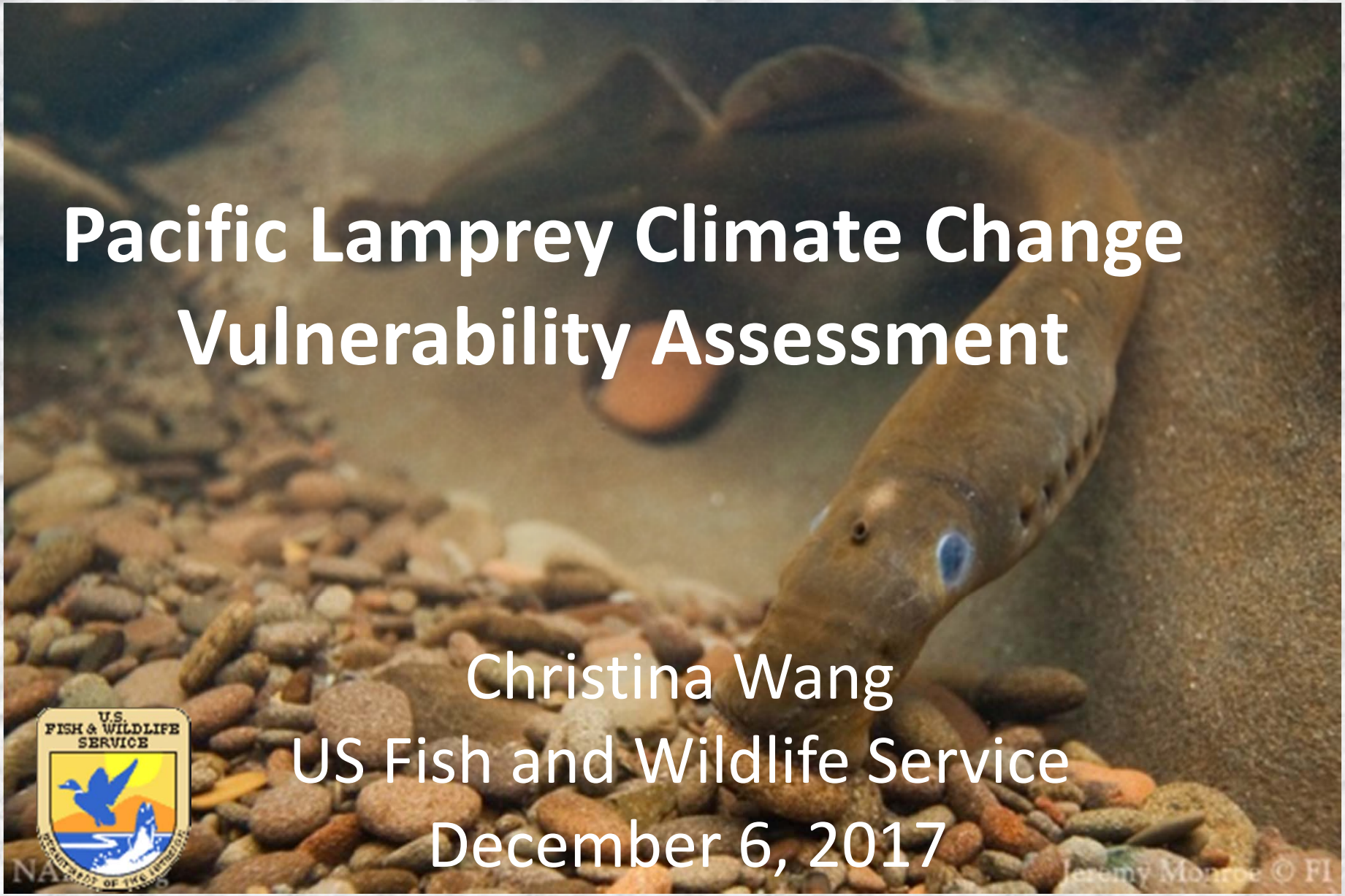

Pacific Lamprey Climate Change Vulnerability Assessment

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Funded by: North Pacific LCC

Pacific Lamprey Climate Change Vulnerability Steering group:
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Special thanks:
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UW Climate Impacts Group

Pacific Lamprey Conservation Initiative

Goal: Achieve long term persistence of Pacific Lamprey to support traditional tribal cultural use

- **Assessment –** Identified climate change as a key uncertainty
- **Regional Implementation Plans -** Impact of climate change on priorities for restoration actions

Pacific Lamprey Sensitivity to Exposure

Adults

Migration timing

Holding over

Spawning

Stream Temp

Macropthalmia

Transformation

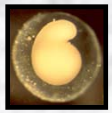
Migration timing

Hydrologic Timing

Ammocoetes

Rearing

Migration

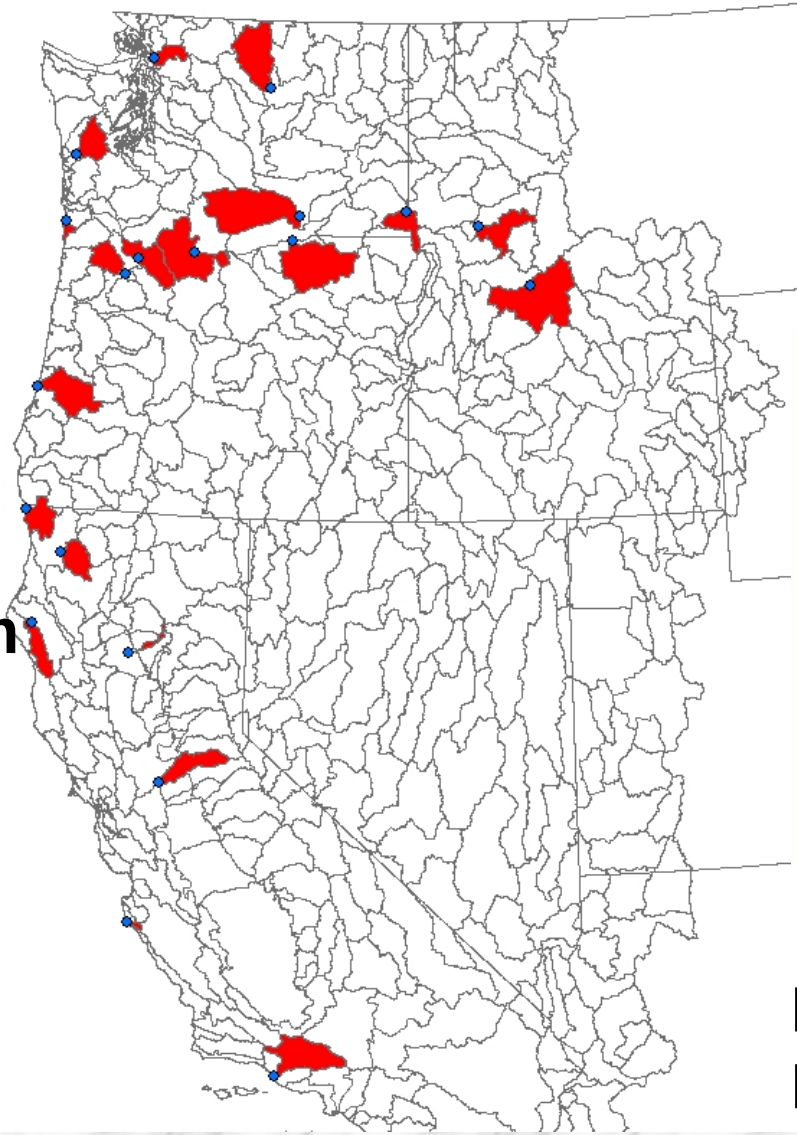


Eggs

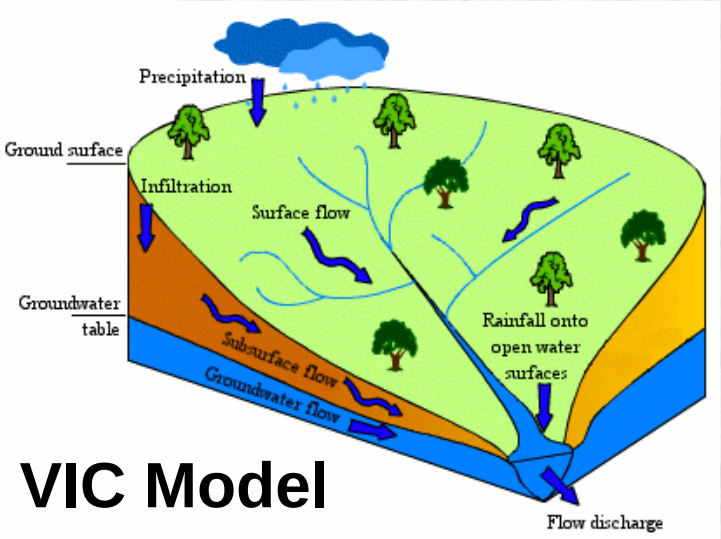
Hatching

MF Salmon
Selway
Asotin
Methow
Yakima
Umatilla
Klickitat
Skagit
Chehalis
Necanicum
Umpqua
Sandy
Tualatin
Smith
SF Eel

CMIP 5 Dataset



3 Global Climate Models-
NorESM1-M
bcc-csm1-1-m
CSIRO-Mk3-6-0



VIC Model

Emission Scenarios
RCP 4.5 and RCP 8.5

Mid-Century (2040-2069) and End of Century (2070-2099)

NatureServe CCVI Components

1. Exposure to climate change
2. Indirect exposure
3. Species specific sensitivity

Exposure to Climate Change

- August mean stream temperature
- Hydrologic mean date
- Change from historic exposure to future (mid- and end century) exposure

Indirect Exposure

1. Exposure to sea level rise
2. Distribution relative to natural barriers
3. Distribution relative to anthropogenic barriers
4. Predicted impact of land use changes from human response to climate change

- Designate level of vulnerability from “Greatly Increase” to “Somewhat Decrease”

Sensitivities

1. Dispersal and movements
2. Historical and physiological thermal niche
3. Historical and physiological hydrologic niche
4. Dependence on disturbance regime and CC
5. Dependence on another species for habitat
6. Dietary versatility
7. Interspecific interactions
8. Measured genetic variation

- Designate level of vulnerability from “Greatly Increase” to “Somewhat Decrease”

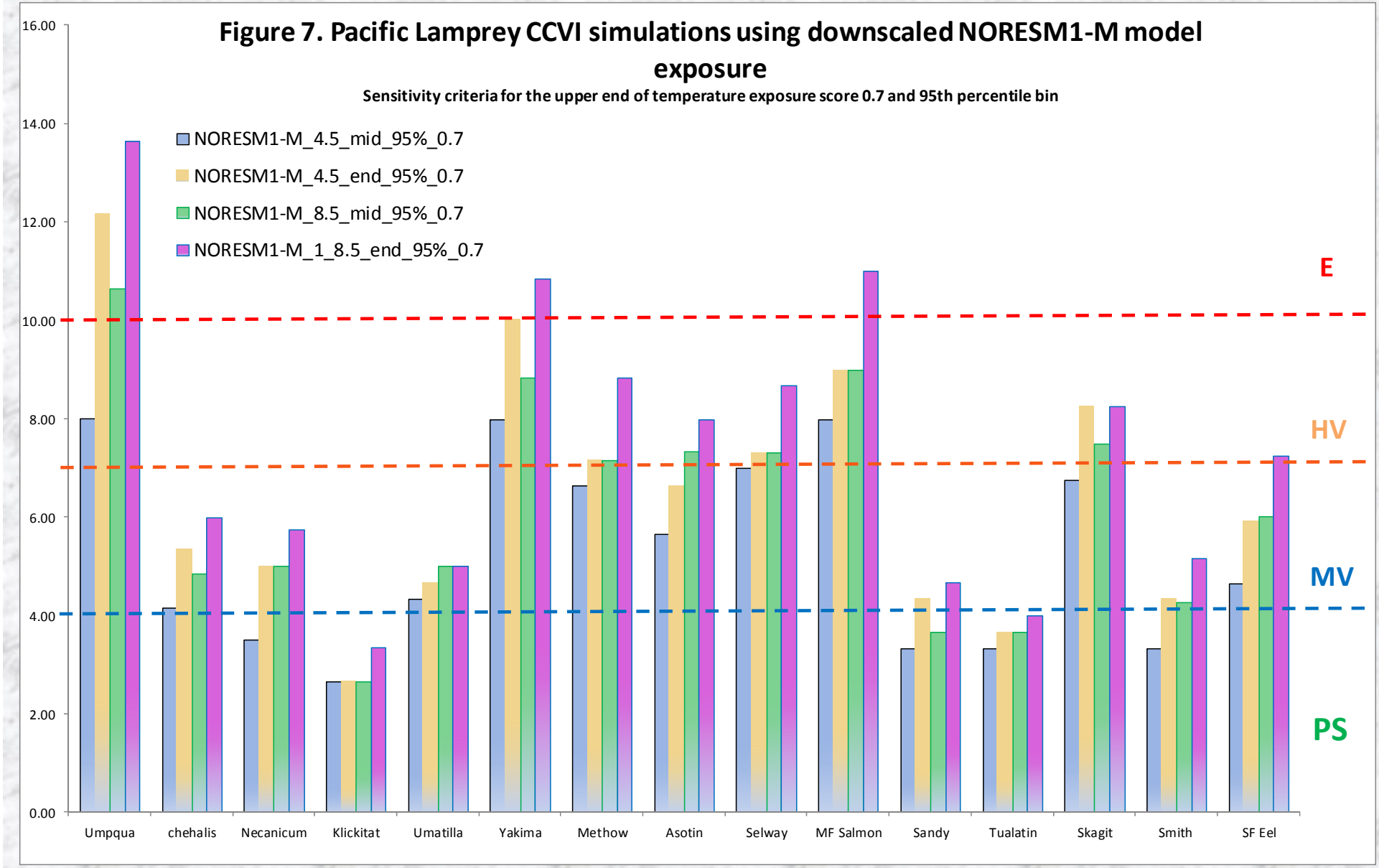


Figure 7. Pacific Lamprey CCVI simulations using downscaled NORESM1-M model exposure
Sensitivity criteria for the upper end of temperature exposure score 0.7 and 95th percentile bin
NORESM1-M_4.5_mid_95%_0.7
NORESM1-M_4.5_end_95%_0.7
NORESM1-M_8.5_mid_95%_0.7
NORESM1-M_1_8.5_end_95%_0.7
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
E
HV
MV
PS
Umpqua
chehalis
Necanicum
Klickitat
Umatilla
Yakima
Methow
Asotin
Selway
MF Salmon
Sandy
Tualatin
Skagit
Smith
SF Eel

Conclusions

- In all three GCMs, the Umpqua and Yakima were the most vulnerable HUCs
- Umpqua had relatively low variation in its historic stream temperature and hydrologic timing
- Anthropogenic barriers in the Yakima
- In all three GCMs, the most stable HUC is the Klickitat, Presumed Stable for all GCMs, RCPs, and time periods

Prioritizing Restoration

- South Coast OR Regional Implementation Plan - Umpqua
- NatureServe risk rank = S2 Imperiled
- CC vulnerability = EV by 4.5 End of Century
- Threats – Dewatering and flow management; stream and floodplain degradation; water quality

Prioritizing Restoration

Actions that can:

- increase flow;
- create backwater habitat;
- restore riparian vegetation; and
- reduce stream disturbances from dredge mining

may have a higher likelihood of mitigating the increasing risk from climate change impacts