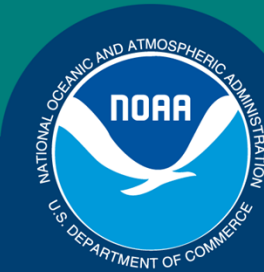


Science, Service, Stewardship



# Preliminary Comparison of All-Citizens and Treaty Tribal Gillnet Fishery Effort and Marbled Murrelet (*Brachyramphus marmoratus*) Population Trend Data in the Salish Sea

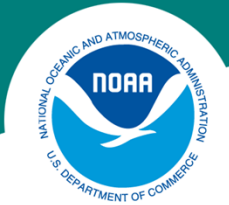
February 26, 2015

Amilee Wilson, NOAA Fisheries

National Marine Fisheries Service

West Coast Region

**NOAA  
FISHERIES  
SERVICE**



## Background

- Marbled murrelet entanglements occur in Pacific salmon gillnet fisheries in the Salish Sea
- Marbled murrelet population in Washington was in decline from 2001-2010 (Miller et al. 2012)
- Gillnet fishery catch effort has increased from 2001-2010 (Adicks 2011; Adicks 2012; Beattie 2011; Beattie 2013)
- USFWS Recovery Implementation Team (RIT) and stakeholders completed a final report identifying risk mechanisms (USFWS 2012)
- NOAA began a collaborative spatial modeling effort with USFWS, Forest Service, WDFW, and PSIT to overlay marbled murrelet population density data with fisheries catch effort data



## Objectives

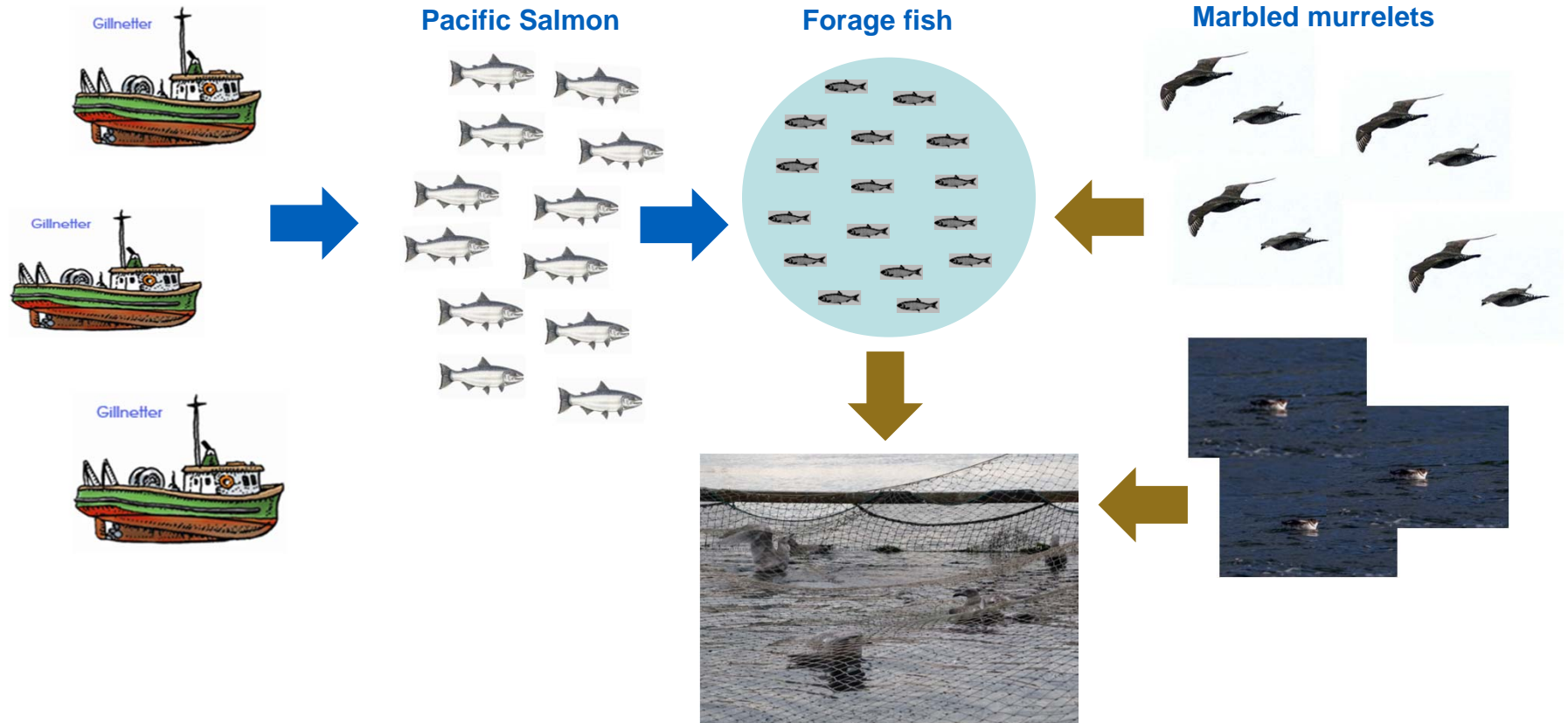
- Examine area and seasonal timing of both birds and fisheries
- Identify the overlap of high density marbled murrelet areas and increased fishery effort
- Determine whether a correlation exists between the decline in marbled murrelet population trend and increase in gillnet fishery effort from 2001-2010
- Identify “hotspots” that will inform the next fisheries ESA consultation







# Potential interactions for marbled murrelets and Pacific salmon fisheries





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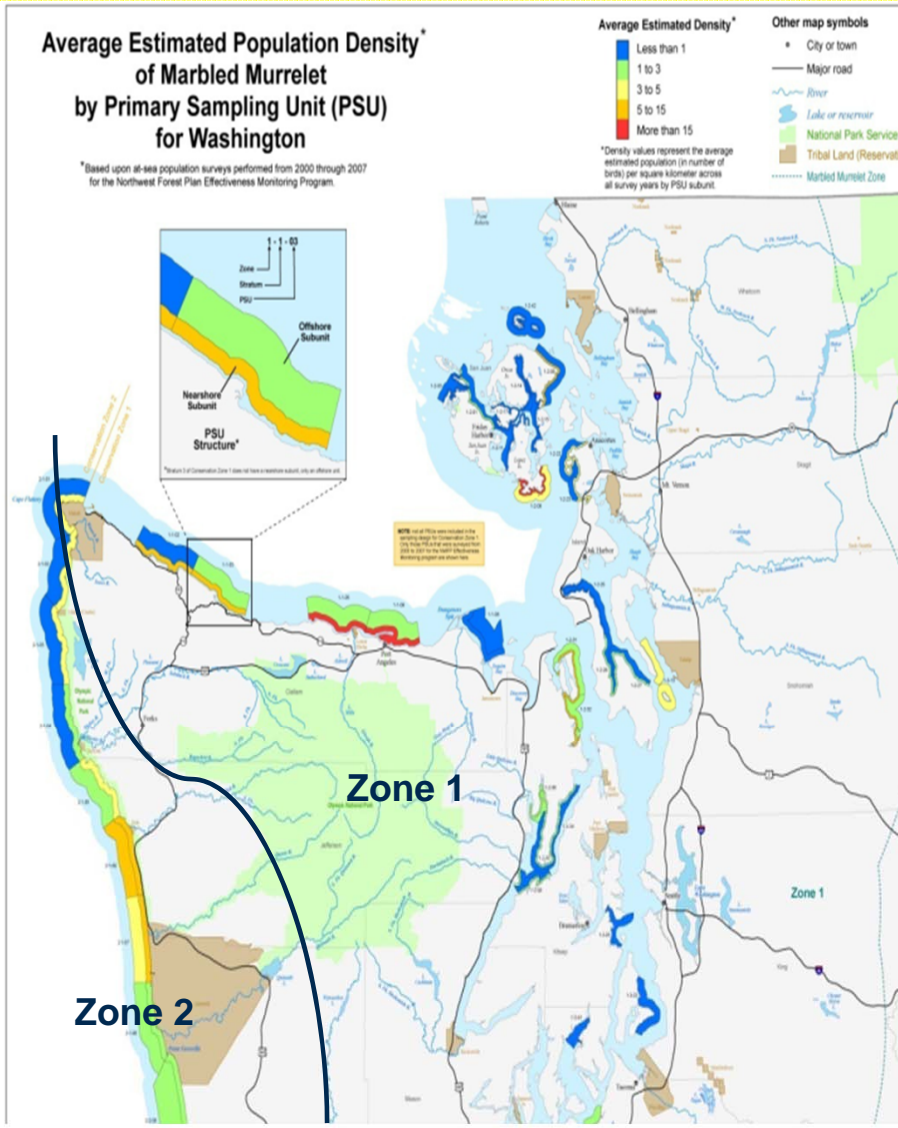
WDFW



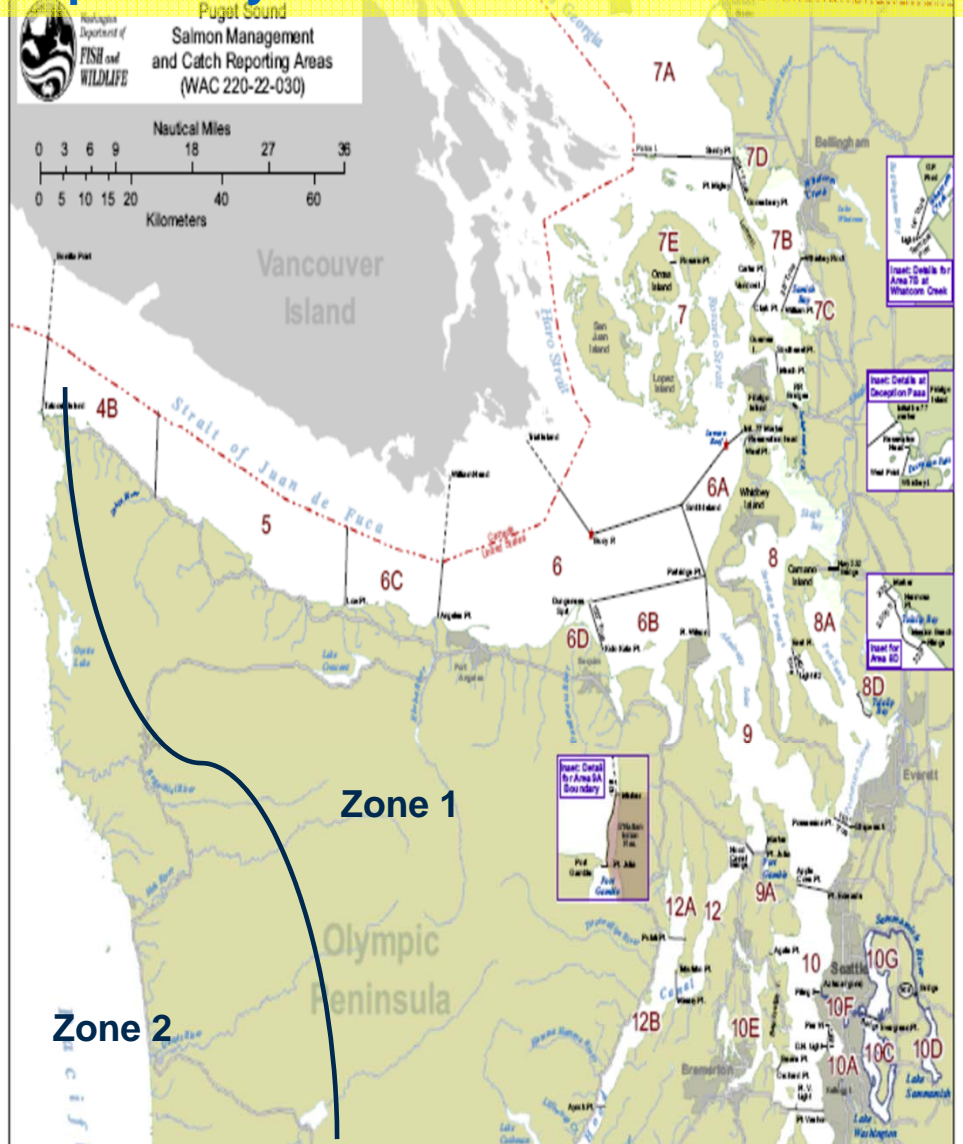
WDFW



## Marbled murrelet foraging areas overlap closely with salmon harvest areas

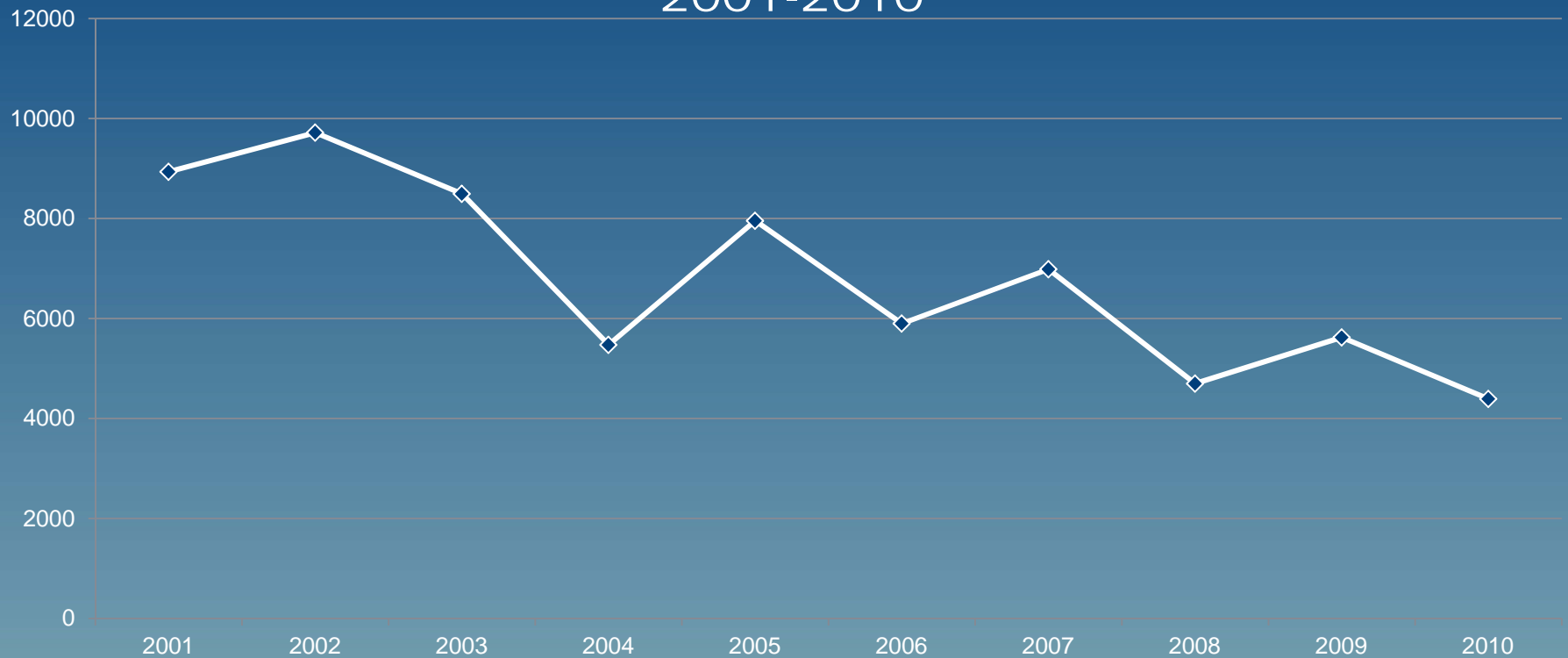


Source: Northwest Forest Plan Effectiveness Monitoring Team

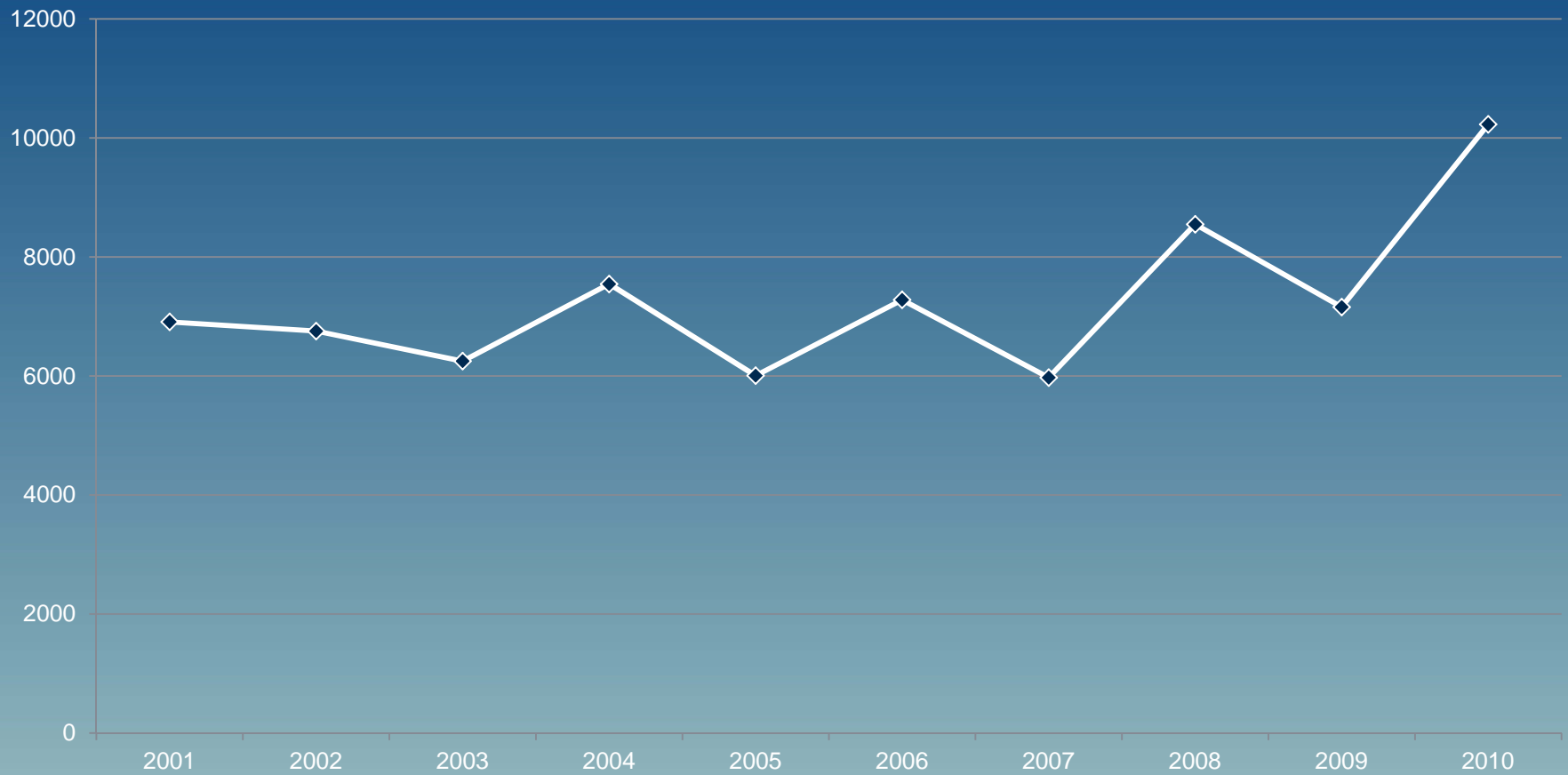


Source: Washington Department of Fish & Wildlife

## Zone 1 marbled murrelet average yearly summer abundances 2001-2010



# Zone 1 Gillnet Fishery Effort

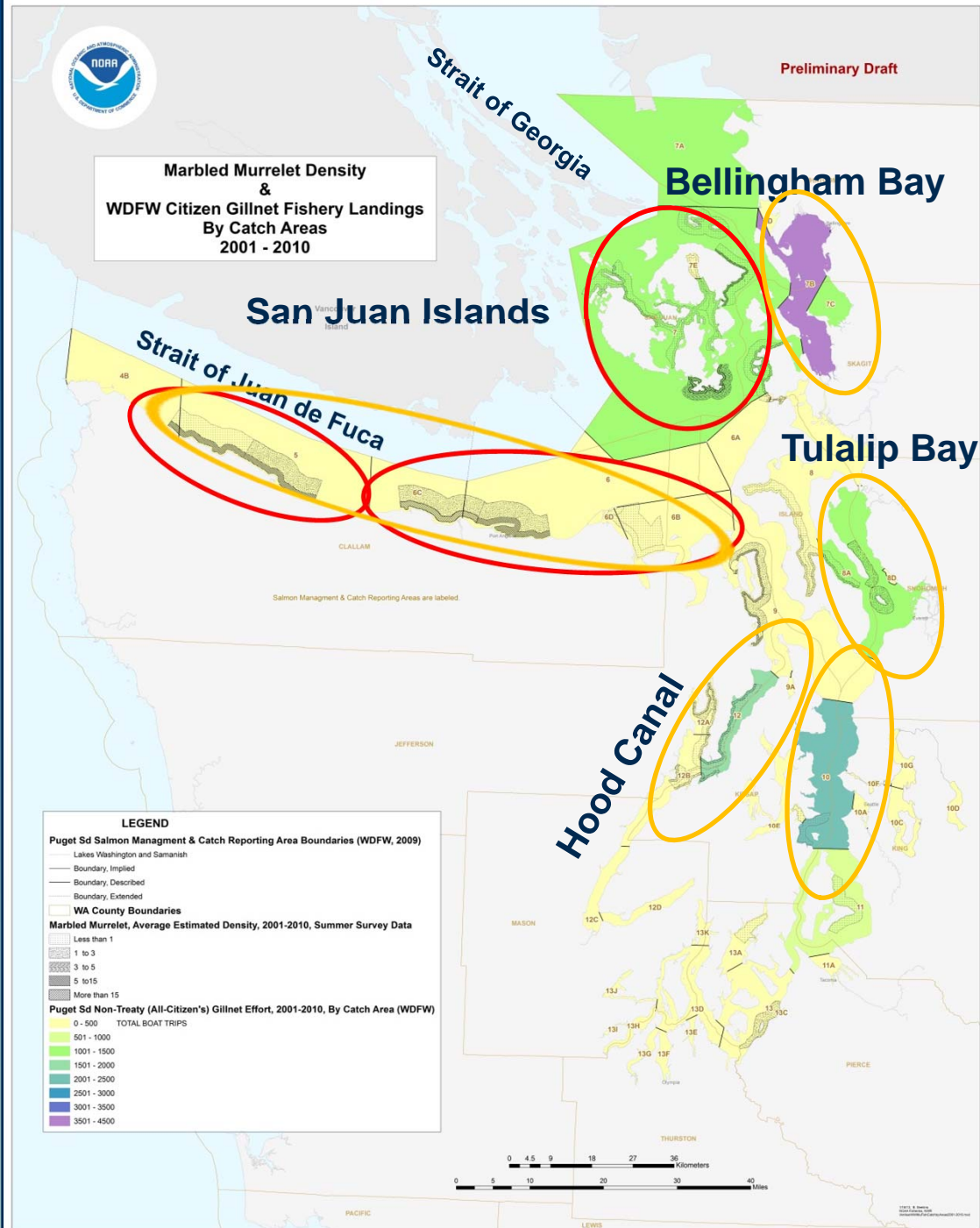




# All-Citizen's Fishery Results

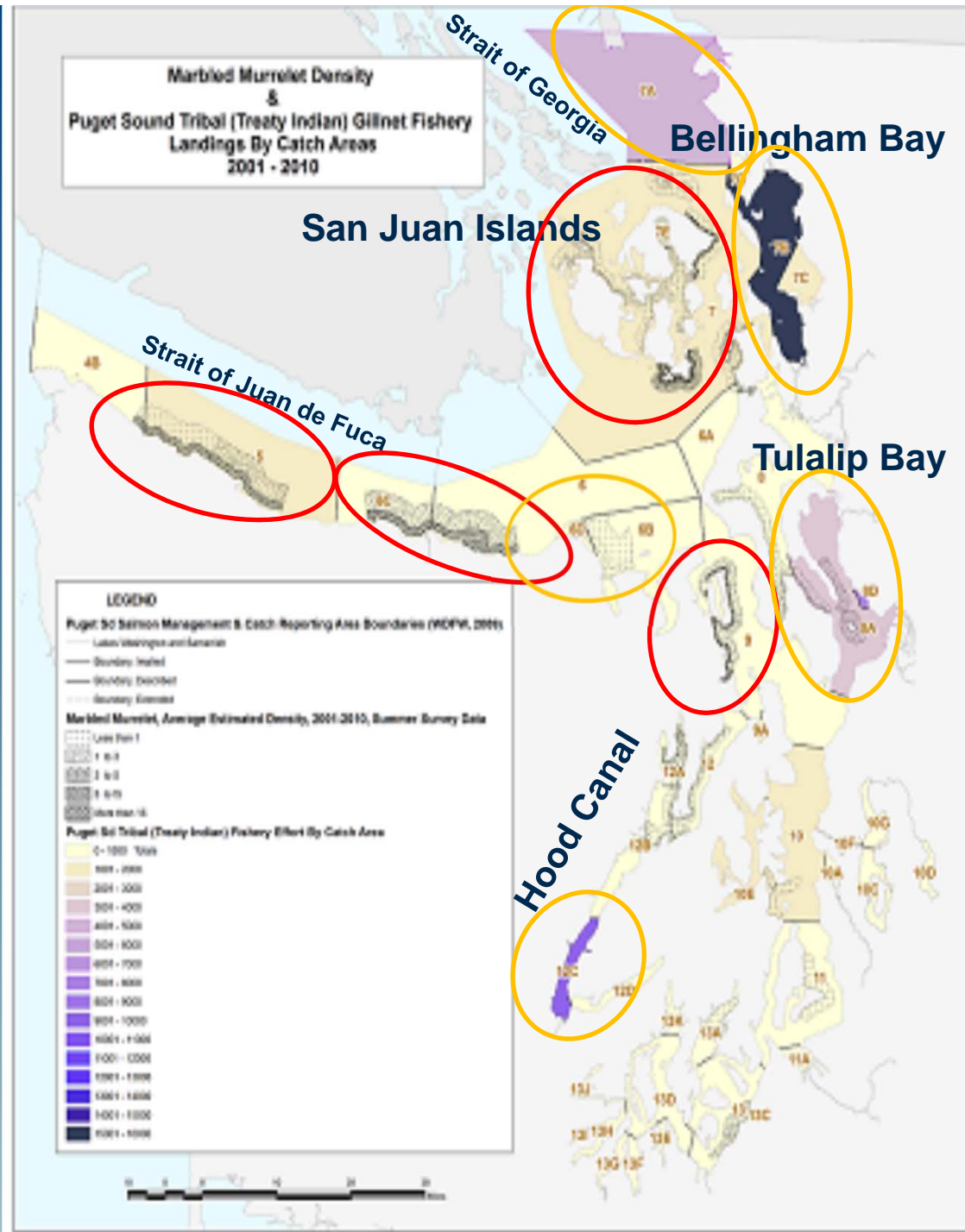
## Legend (circles)

Red = high mambu  
abundance ( $> 5$  birds/m<sup>2</sup>)  
Yellow = high catch  
effort ( $> 600$  landings)



# Treaty Tribal Fishery Results

Legend (circles)  
 Red = high mamu  
 abundance (> 5 birds/m<sup>2</sup>)  
 Yellow = high catch  
 effort (> 600 landings)



# Summary

- **There is clear overlap in area and seasonal timing of bird densities & gillnet fisheries in nearshore and offshore areas of Zone 1**



Maria Mudd Ruth

- **Preliminary analysis shows fishery effort for Zone 1 in Washington State has decreased over the last ten years in areas with historically high fishery catch rates corresponding with a high presence of marbled murrelets**
- **In areas with historically low fishery catch rates and presently low incidences of marbled murrelet, fishery efforts have increased**

# Summary

- **No clear correlation exists between the decline in mamu population density estimates and the increase in fishery effort**
- **Specific areas of high fishing concentrations vary by fishery (state or tribal); no hotspots identified**



## All-Citizen's fishery:

- 8D (Tulalip Bay)
- 7B (Bellingham Bay)

## Potential areas to watch

- 10 (mid-Puget Sound)
- 12 (mid-Hood Canal)
- 8A (Tulalip Bay)

## Treaty Tribal fishery:

- 8D (Tulalip Bay)
- 7B (Bellingham Bay)
- 12C (southern Hood Canal)

## Potential areas to watch

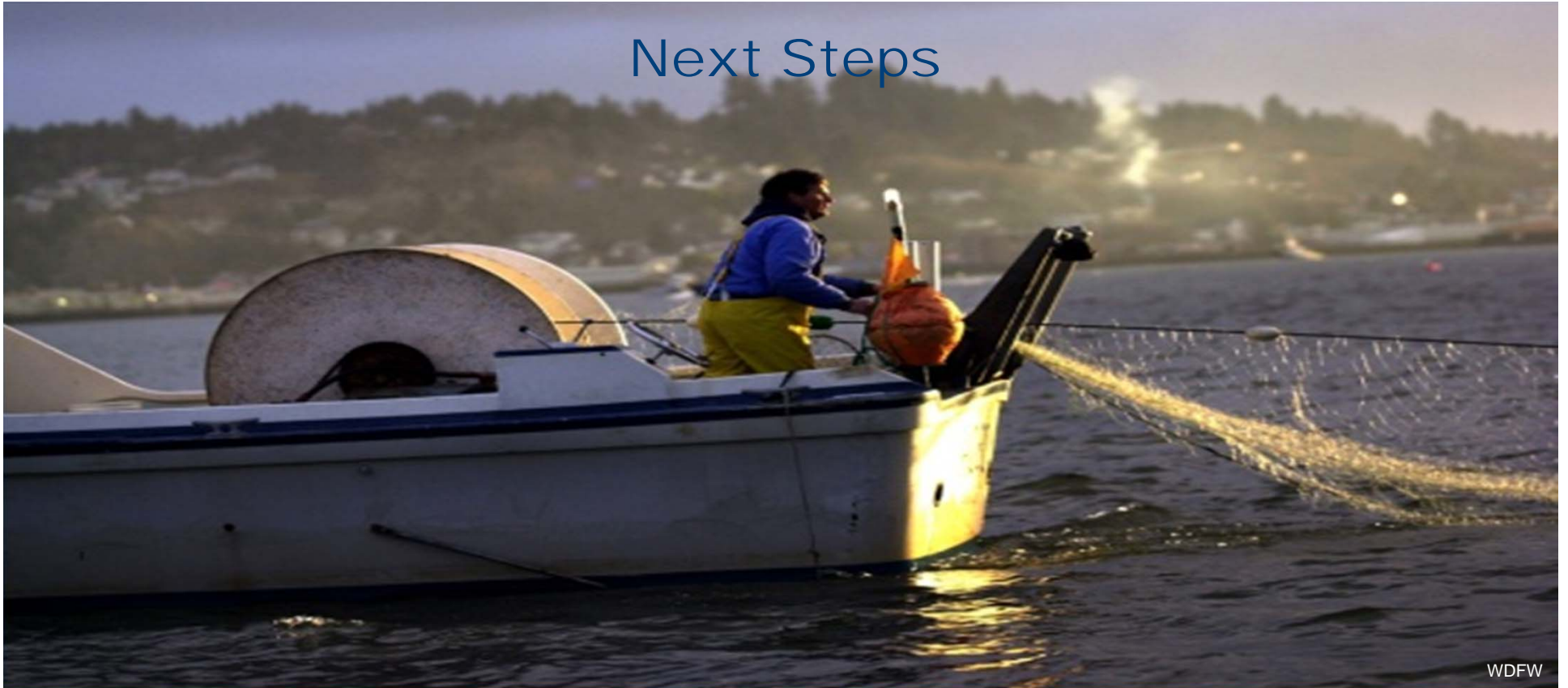
- 7A (southern Strait of Georgia)

High catch areas

High catch areas



## Next Steps



WDFW

- **Present findings to state and tribal co-managers and discuss continuing actions for reducing sea bird interactions and mortality**
- **Support additional research and monitoring needed to determine the extent of net mortality**
- **Work with FWS staff to incorporate these findings into the 2015 Puget Sound salmon fishery consultation**



## Acknowledgements



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- Kendall Henry



### **NWIFC**

- William Beattie



### **NOAA**

- Barbara Seekins