Sea Duck Joint Venture
Annual Project Summary for Endorsed Projects
FY 2005 – (October 1, 2004 to Sept 30, 2005)

Project Title (SDJV Project #28, Year 3 of a 4 year ongoing project):

Determination of breeding area, migration routes, and local movements associated with Surf and White-winged Scoters wintering in the inner marine waters of Washington State.

Principal Investigator(s):

David Nysewander (DRN), Joseph Evenson (JRE), and Don Kraege (DKK),.
Washington Department of Fish and Wildlife (WDFW),
600 Capitol Way N, Olympia, WA 98501-1091.
DKK: (360) 902-2522. kraegdkk@dfw.wa.gov
DRN: (360) 902-8134. nysewdrn@dfw.wa.gov
JRE: (360) 902-8137. evensjre@dfw.wa.gov

Partners:

University of Wyoming:
Eric Anderson, University of Wyoming: emander@uwyo.edu
Jim Lovvorn, University of Wyoming; lovvorn@uwyo.edu
USGS, San Francisco Bay:
John Takekawa, USGS; john_takekawa@usgs.gov
Susan Wainwright-De La Cruz, USGS; susan_wainwright@usgs.gov
Matt Wilson, USGS, mwilson@usgs.gov
Canadian Wildlife Service, British Columbia and Simon Fraser University:
Sean Boyd, CWS; sean.boyd@ec.gc.ca
Dan Esler, Simon Fraser University; desler@sfu.ca
Erika Lok, Simon Fraser University; eklok@sfu.ca
USGS, Alaska Science Center:
David Ward, USGS, david_ward@usgs.gov

Project Description:

The significant declines in wintering scoter populations distributed throughout Washington State marine waters over the last 25 years impelled the Washington Department of Fish and Wildlife (WDFW) to find additional needed information and start in 2003 the current ongoing four-year focus study that is presently using implanted satellite (PTT's) and VHF radio transmitters to better understand the demography associated with Surf and White-winged Scoters that frequent Washington State waters during the year. WDFW has implanted during the first three years a total of 60 satellite PTT transmitters in scoters (Surf, 36 and White-winged, 24) captured on the wintering grounds in the inner marine waters of Washington. This project has also implanted 60 VHF transmitters into Surf Scoters, facilitating examination of other facets of their demography. This increased focus on Surf Scoters is considered vital since the decrease in this species is increasingly considered to be the largest component of the declines observed overall for scoter species in Washington.

Other research efforts in Baja California Mexico, San Francisco Bay, and the Strait of Georgia in British Columbia, have also deployed satellite PTT and VHF transmitters during some portion of the last three years in Surf Scoters; a certain percentage of these scoters also spend some extended time in the marine waters of Washington State. Our VHF tracking efforts in Washington and nearby British Columbia have recorded location data on scoters from these other areas and have helped begin to characterize some of the important migration, staging, and molting options utilized here. Both our VHF and PTT data have also been used in Southeast Alaska and the Northwestern Territory in Canada to complement ongoing scoter work in those areas.

Objectives:

The objectives of this project are to document the pattern of use and fidelity to winter and spring foraging areas, night roosting areas, migration routes, breeding sites and range, and molting areas of White-winged and Surf Scoters that winter in the inner marine waters of Washington State. These objectives address several of the high priority needs identified in the SDJV 2001-2006 Strategic Plan concerning population definition and delineation of White-winged Scoters and Surf Scoters: migration corridors used between various breeding and wintering areas, wintering areas used by scoters from various breeding areas, and determination of important spring staging areas and late summer molting areas associated with scoters from various breeding and wintering areas along the western coast of North America.

This project also continues and expands ongoing collaboration with other simultaneous scoter research efforts in nearby regions, increasing the probability of reaching conclusions and results more widely applicable to the population and flyway for these particular species.

1) Continuing collaboration with and support of the foraging and prey studies of Anderson and Lovvorn (University of Wyoming) by facilitating sampling of scoters (blood and fat), as well as capturing Surf Scoters at other specific sites requested.
2) Coordinating closely with British Columbia work on both Surf and White-winged Scoters to better understand annual variation, improve sample sizes monitored, and reach conclusions compatible with data and needs for our shared marine waters.
3) Sharing specific tracking and location results with our partners/collaborators from San Francisco Bay, British Columbia, Southeast Alaska, and Northwestern Territory to facilitate these ongoing simultaneous scoter research efforts.

Preliminary Results:

Wintering scoters were captured with floating mist nets between 22 November, 2004, and 25 February, 2005 in three areas of Puget Sound: 1) Peale Passage, Henderson and Eld Inlets (SPS); 2) Port Orchard and Sinclair Inlet (CPS); and 3) Penn Cove, Oak Harbor and Birch Bay (NPS). The nets were set in areas frequented by White-winged and Surf Scoters. The 15 days when capture efforts were implemented resulted in the live-capture of 183 sea ducks, banding 44 White-winged, 138 Surf Scoters, and two Barrow's Goldeneye. PTT's (PTT-100 satellite transmitters [39 g] manufactured by Microwave Telemetry Inc., Columbia, Maryland) were surgically implanted in 22 ATY Surf Scoters (5 males and 17 females), and 4 White-wing Scoters (2 males and 2 females). In addition, 35 Surf Scoters and 2 White-winged scoters were surgically implanted with ATS A2300 VHF transmitters (Table 1).

Table 1. Summary of Washington Surf and White-winged scoters implanted with PTT and VHF transmitters during winter 2004-2005, by sex and capture area.

Surf Scoters	**VHF**			**PTT**		
Capture Area	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Southern Puget Sound (SPS)	8	2	10	2	4	6
Central Puget Sound (CPS)	6	6	12	1	8	9
Northern Puget Sound (NPS)	3	10	13	2	5	7
Total	17	18	35	5	17	22

White-winged Scoters	**VHF**			**PTT**		
Capture Area	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Southern Puget Sound (SPS)	0	0	0	2	1	3
Central Puget Sound (CPS)	0	0	0	0	1	1
Northern Puget Sound (NPS)	2	0	2	0	0	0
Total	2	0	2	2	2	4

All captures occurred during pre-dawn and early post-dawn periods of each day, as scoters were flying into the feeding areas from their resting areas used at night. Blood and feather samples were collected from both species and shared with USGS (Genetics, Anchorage office), Canadian Wildlife Service (University of Saskatchewan), and University of Wyoming research (Dr. James Lovvorn and Eric Anderson). VHF movements were followed throughout the winter and spring until mid-May 2005, then again during the molt (early September 2005).

Pre-northern migration: Most of the scoters tracked displayed considerable fidelity to the general region or subregion of Washington's inner marine waters where they were captured. There were individual variations over time during winter where movements appeared to be related to other factors like timing of herring spawning.

Northern migration including staging areas used enroute: Two figures (Figures 1 and 2) display the movements captured for Surf Scoters and White-winged Scoters respectively in 2005. Table 2 summarizes spring marine areas used by Surf (spring 2004 and 2005 between March and mid-May) and White-winged scoters (spring 2003 – 2005) from all PTT transmitted birds from Washington. All birds from both species spent much of the spring within Washington and the Strait of Georgia (WASOG). Thirty five percent of Surf Scoters visited Northwest British Columbia and South East Alaska (NWBC/SEAK). The proportion of males and females visiting these areas were similar. The marine waters of NWBC/SEAK were utilized by 21% of White-winged Scoters, being used by a higher proportion of females than males (females 30%, males 11%).

Table 2. Spring marine use areas of PTT transmitted Surf and White-winged scoters from Washington State, Spring 2003 – 2005.

Species	Sex	Washington / Strait of Georgia	Northwest B.C. / S.E. Alaska
SUSC	**M**	6 / 100%	2 / 33%
SUSC	**F**	17 / 100%	6 / 35%
Total		**23 / 100%**	**8 / 35%**
WWSC	**M**	9 / 100%	1 / 11%
WWSC	**F**	10 / 100%	3 / 30%
Total		**19 / 100%**	**4 / 21%**

Breeding areas: Two figures (Figures 3 and 4) depict the nesting areas for Surf and White-winged Scoters respectively, as perceived over the first three years of WDFW tracking of PTT data. There is some suggestions of slightly different breeding ranges or preferences, if you draw a line between centers of Great Bear Lake, Great Slave Lake, and Lake Athabaska. This beginning data set would suggest that White-winged Scoters from Washington wintering areas favor the more western and southern areas while Surf Scoters from Washington may favor an area more to the north and east. These data are being further analyzed and will be displayed on the WDFW scoter tracking web site.

Southern migration staging areas and molting areas: Here again there are suggestions of differences in percentages and areas used between the two scoter species. Molting areas used by both species of scoters also varied by species and sex (Table 3). The WASOG was the most used area by both species (Surf 50%, White-winged 47%). The proportion of males and females using these areas was similar for White-winged Scoters; however this ratio was not similar for Surf Scoters (female 64%, male 0%). It should be noted, however, that the sample size of Surf Scoter males was low (N = 4). Of this small sample, 75% utilized marine areas north of SEAK. Males from both species exclusively used the marine areas north of SEAK. The Canadian Interior was used by 27% of female White-winged Scoters; no male White-winged Scoters, nor any Surf Scoters used this area to molt.

Table 3. Molting areas used by PTT transmitted Surf and White-winged scoters from Washington State, Summer/Fall 2003 – 2005.

Species	Sex	CA/OR/WA Coast	WASOG	SE Alaska	North of SE Alaska	Canadian Interior
SUSC	**M**	1 / 25%	0 / 0%	0 / 0%	3 / 75%	0 / 0%
SUSC	**F**	0 / 0%	9 / 64%	5 / 36%	0 / 0%	0 / 0%
Total		**1 / 6%**	**9 / 50%**	**5 / 28%**	**3 / 17%**	**0 / 0%**
WWSC	**M**	1 / 17%	3 / 50%	0 / 0%	2 / 33%	0 / 0%
WWSC	**F**	0 / 0%	4 / 44%	1 / 11%	0 / 0%	4 / 44%
Total		**1 / 7%**	**7 / 47%**	**1 / 7%**	**2 / 13%**	**4 / 27%**

Nocturnal and Diurnal Distribution and Activity Patterns: Varied patterns of distribution and activity were observed on wintering, migration, and breeding grounds. Migration generally occurred at night. Locations of night concentrations were often different from those observed during the day. All of these have implications for the scoter biology as well as management implications or concerns such as oil spills.

Project Status:

Our project was very successful this year in successfully implanting a much larger number of implanted transmitters into female Surf Scoters, that survived the hunting season and moved north to nesting grounds. This complements work coming out of San Francisco Bay and other regions. Some new understanding has also been gained about the degree of mortality these species may incur from hunting, eagle predation, and other factors. Information for the first time on distribution data such as their nocturnal concentrations is now available. All of this will be helpful for WDFW and other agencies in the development of management strategies for these species in Washington. We are documenting interesting differences between subregions in Washington used by wintering scoter concentrations and our work complements the foraging/prey work ongoing by Anderson and Lovvorn.

The WDFW project is expected to continue addressing similar issues as described related to Surf Scoters and White-winged Scoters wintering in western Washington. An additional 13 PTT's and 25 VHF transmitters will be implanted during the 2006 winter period in Washington State. WDFW will continue to produce detailed maps showing migration routes, spring and fall migration areas, and local movements throughout the life of the transmitters implanted. A WDFW web site is scheduled to be available by October 2005 that will display individual and summary maps displaying the tracking of the 60 satellite transmitters put out during the 2003 to 2005 efforts. Other maps, locations, and data summaries will be provided additionally to interested parties as requested. Presentations and publications will be developed. Ongoing marine bird aerial surveys and focused ground monitoring of the 60-85 VHF transmitters that have been or will be deployed will provide additional distribution and local movement information. Blood samples collected have been and will be provided to USGS/BRD Alaska Science Center scoter genetics project as needed (materials and methodology provided by USGS, Alaska Science Center).

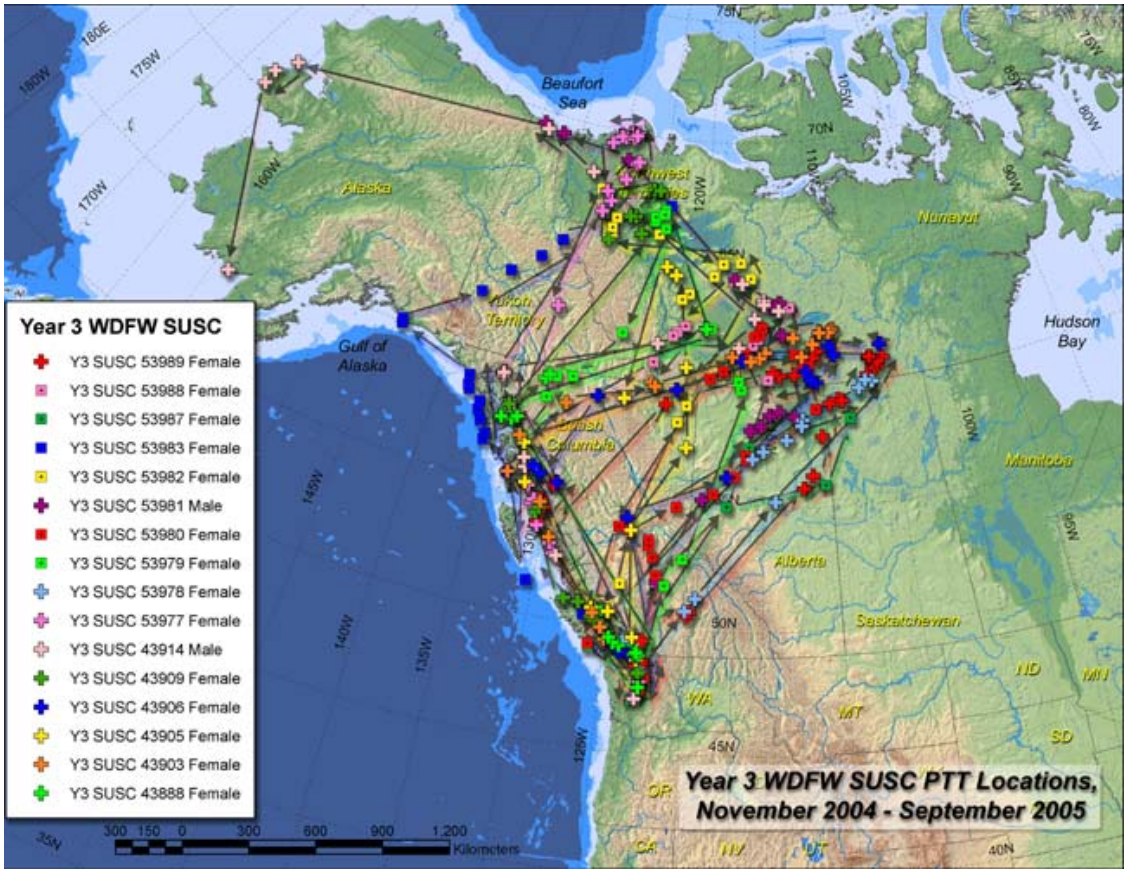

Figure 1. Movements of PTT transmitted Surf Scoters wintering in Washington State, 2005.

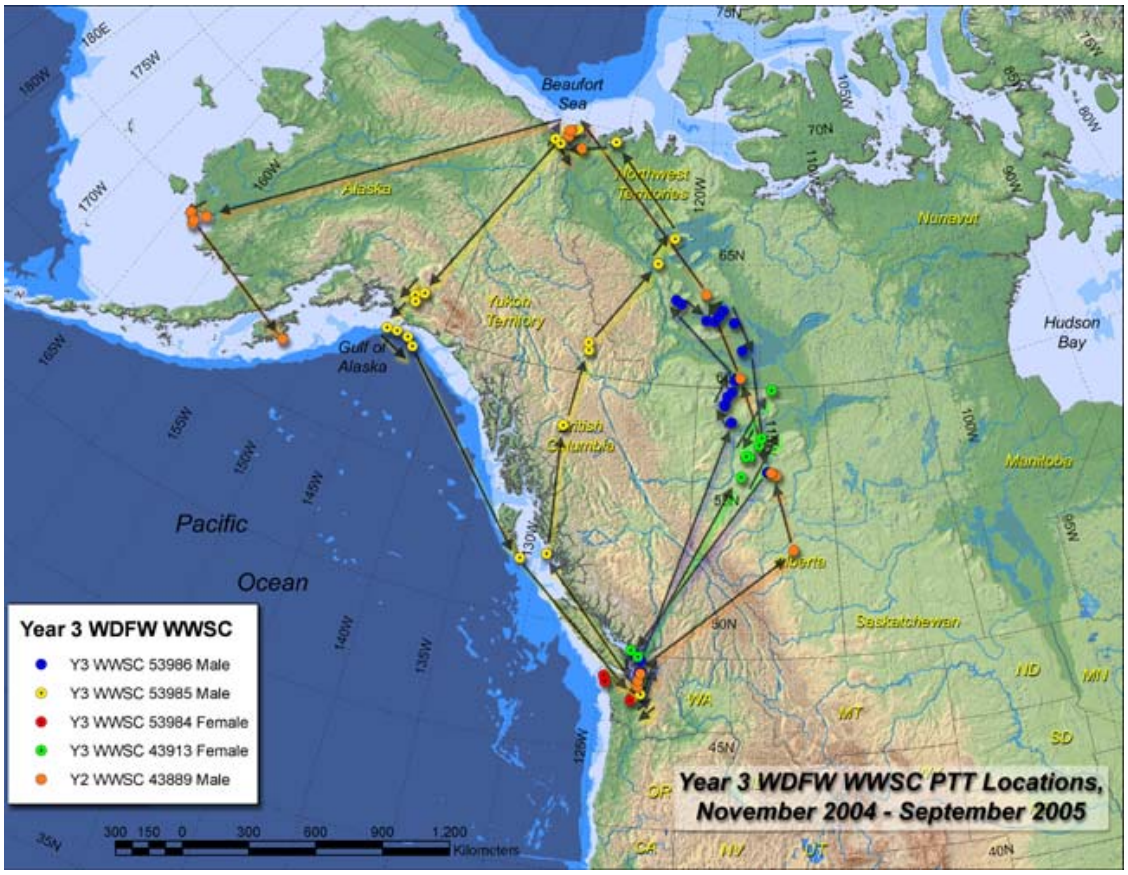

Figure 2. Movements of PTT transmitted White-winged Scoters wintering in Washington State, 2005.

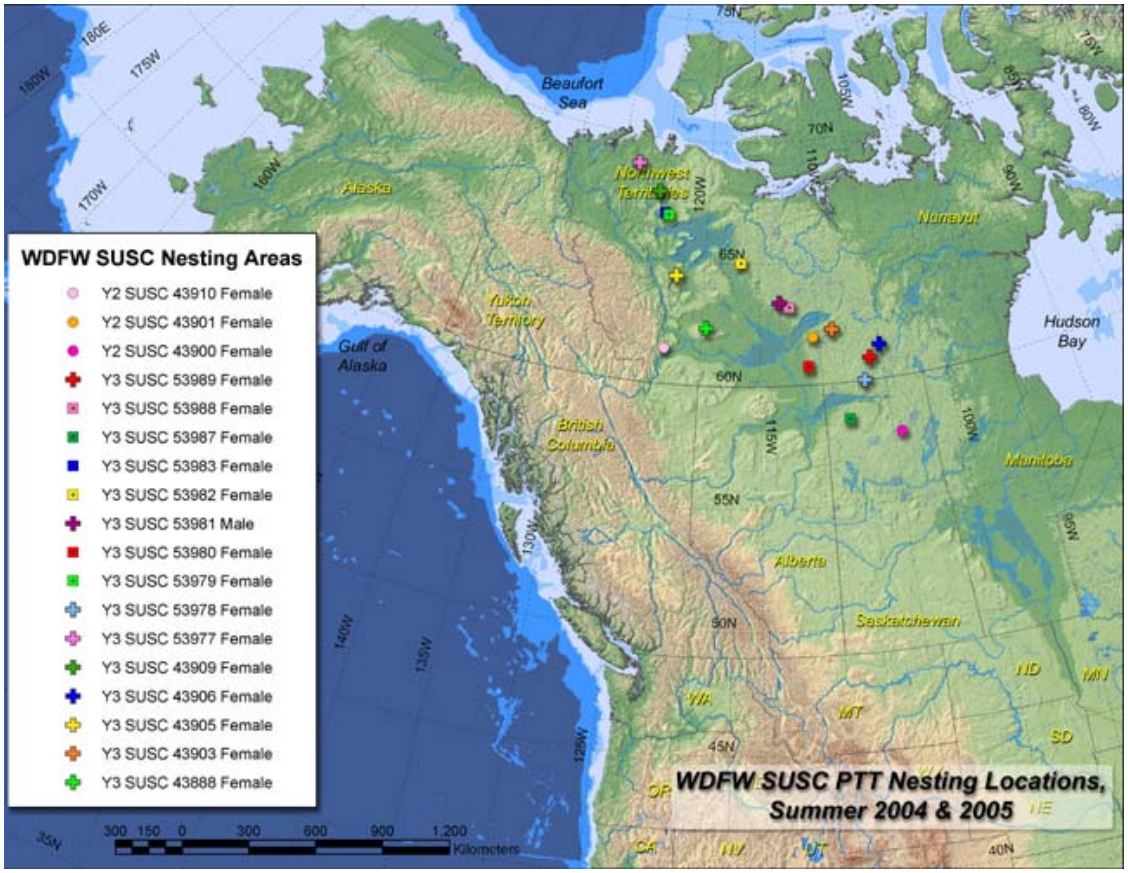

Figure 3. Nesting locations (summer 2004 and 2005) of PTT transmitted Surf Scoters wintering in Washington State.

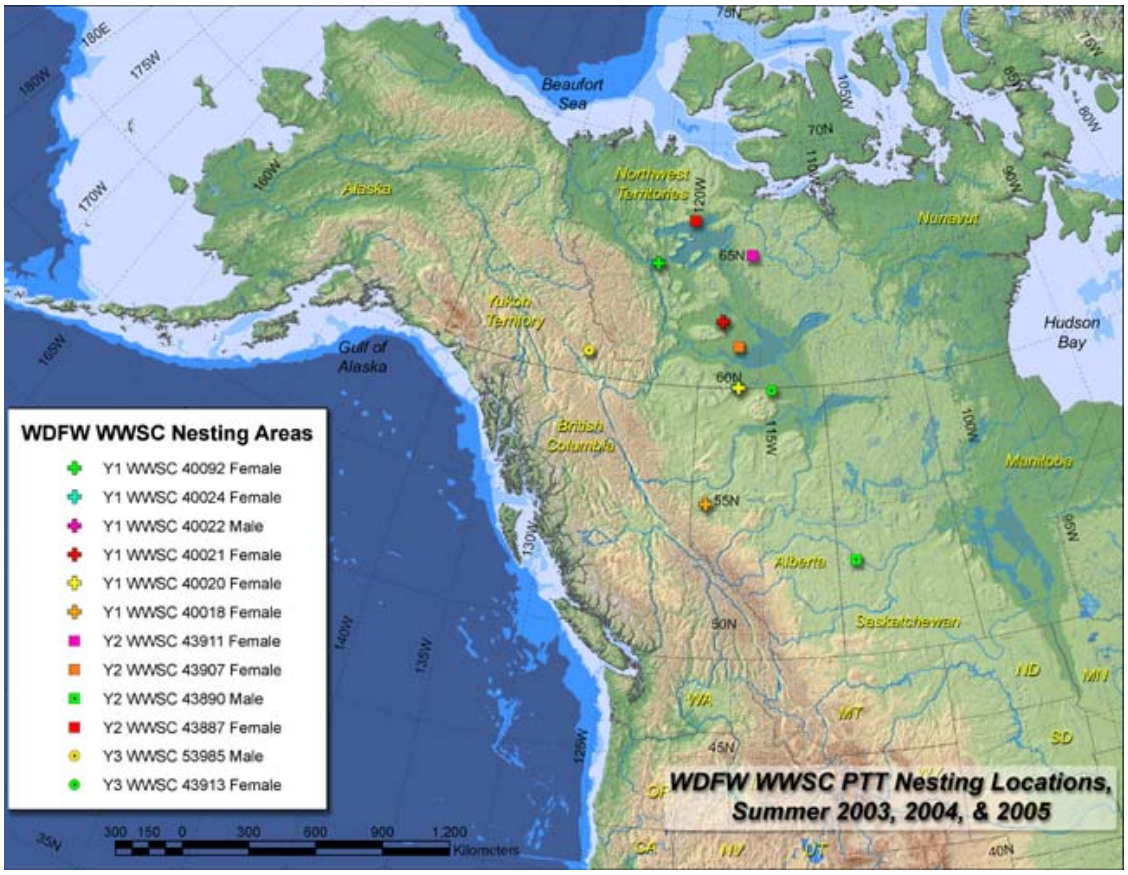

Figure 4. Nesting locations (summer 2003 – 2005) of PTT transmitted White-winged Scoters wintering in Washington State.

Project Funding Sources (US$).

SDJV (USFWS) Contribution	Other U.S. federal contributions	U.S. State non-federal contributions	Canadian federal contributions	Canadian non-federal contributions	Source of funding (agency or organization)
$ 27,500					SDJV
	$58,150				State Wildlife Grants
		$200,048			Washington Dept. of Fish and Wildlife

Total Expenditures by Category (US$).

ACTIVITY	BREEDING	MOLTING	MIGRATION	WINTERING	TOTAL
Banding					$15,000
Surveys					
Research	$25,000	$30,000	$70,000	$153,948	$270,698
Communication					
Coordination					