Species Status Summary and Information Needs

Sea Duck Joint Venture, March 2015

Note: Satellite telemetry studies indicate that the Pacific and Atlantic breeding and wintering populations are largely allopatric and thus are addressed separately in this document.

Black Scoter *(Melanitta americana)*

Pacific Population

Population Size and Trends: In Alaska, a survey to provide relatively precise estimates of the Pacific breeding population was developed and flown from 2004 to 2010. The visibility-corrected estimate in western Alaska from 2004 to 2010 averaged 133,000 Black Scoter (SE = 21,000) with a positive trend over that period. Compared to similar surveys flown from 1989-1997, the population has declined at an average rate of -3.1% (Stehn et al. 2006). However, from 2004 to 2012, the Pacific Black Scoter Survey indicates an increase in numbers (growth rate = 1.078, 90% CI: 1.043-1.114) with an estimated average population size for the survey area of 140,000 indicated total birds and 133,000 indicated breeding birds (Stehn and Platte 2012). The less intensive Waterfowl Breeding Population and Habitat Survey shows a decline in Black Scoters numbers from 1974-2012 in the Alaska tundra strata but for all of Alaska there is no trend in the past 20 years (Bowman et al. 2015). The Pacific Black Scoter Survey data should be more accurate than the WBPHS data, however the time scale is still quite limited (Bowman et al. 2015).

Priority Information Needs:

1. Continue the Alaska breeding ground survey of Pacific Black Scoters.
2. Develop or refine techniques to estimate detection rates during aerial surveys.
3. Develop training tools and protocol for identifying scoters to species during aerial breeding surveys.

Population Delineation: Most Black Scoters marked with satellite transmitters during winter/spring in southern British Columbia and Alaska (Dutch Harbor, Nelson Lagoon, Kodiak Island) migrated to breeding areas in the Yukon-Kuskokwim Delta and the Bristol Bay Lowland regions of Alaska and females marked during the breeding season on the Y-K Delta wintered from the Alaska Peninsula to Oregon (Bowman et al. 2007). These data indicate that birds from multiple breeding areas wintered sympatrically and various wintering aggregations bred sympatrically (Bowman et al. 2008). Females tracked for >1 year had high return rates to breeding areas and many birds used the same staging and wintering areas in consecutive years (Bowman et al. 2007). One adult female marked in Dutch Harbor, Alaska, migrated to the Seward Peninsula, but no other satellite-tagged Black Scoters have been tracked from North American wintering areas to the Seward Peninsula breeding area, so there is some speculation that Black Scoters breeding in that area may winter in Russia. Genetic analysis of feather samples collected from one breeding area (Yukon-Kuskokwim Delta) and three wintering/staging areas (Alaska Peninsula, Prince William Sound and southern British Columbia) showed no evidence of population differentiation at this spatial scale (Talbot et al. 2005).

Priority Information Needs:

1. Augment sample sizes of radio-marked black scoters to determine links among breeding, molting, and wintering areas for the Pacific population.
2. Document key areas and habitats used by black scoters throughout the year.
3. Determine seasonal movements of non-breeding Black Scoters, especially juveniles (HY, 1st year, 2nd year etc. until breeding age).
4. Opportunistically collect tissue samples necessary for genetic analyses for Black Scoters.
5. Collect tissue and food samples for stable isotope analyses to help determine wintering areas for black scoters that breed in Alaska north of the Seward Peninsula.

Population Dynamics: There are few data available on population dynamics for this species. One breeding population, on the Yukon-Kuskokwim Delta, Alaska, was studied from 2001 to 2004; clutch size averaged 7.5 eggs, nest success ranged from 0.01 to 0.37 among years and duckling survival to 30 days ranged from 0.09 to 0.35 (Schamber et al. 2010). Estimates of female apparent survival based on genetic analysis were 0.46-0.63, but sample size was small and survival was probably underestimated; based on reproductive output, true annual survival is probably >0.9 (Talbot et al. 2005).

Priority Information Needs:

1. Determine demographic and age-specific survival rates in breeding areas throughout their range.
2. Determine factors affecting the reproductive rates and variation in those rates in breeding areas throughout their range.
3. Assess the feasibility to determine the age structure of wintering populations.
4. Develop a demographic model for the species.

Population Ecology: Breeding, molting, migration, and wintering ecology are poorly documented. Only one study of nesting ecology, in Alaska, has been done to date; Schamber et al. (2010) found that nest success was low in three of four years, likely due to predation by Red Fox. Few data have been collected on food habits and feeding ecology in breeding and wintering areas. In general, the relative importance of limiting factors for black scoters is unknown.

Priority Information Needs:

1. Determine important factors (weather, predators, food, etc.) affecting survival and reproductive success (fitness) of the species throughout its range during the breeding period.
2. Determine important factors (weather, predators, food, etc.) affecting survival and reproductive success (fitness) of the species throughout its range during the wintering period.

3. Determine important factors (weather, predators, food, etc.) affecting survival and reproductive success (fitness) of the species throughout its range during the molting period.

Harvest Assessment: The sport harvest of Pacific Black Scoters is quite small; from 1999-2008 the annual average was about 400 birds in Alaska and <100 birds in British Columbia (Baldassare 2014). The annual average sport harvest in the Pacific Flyway (excluding Canada) from 2002-2011 was 567 and the Alaska subsistence harvest was estimated at 11,675 in 2011 (Rothe et al. 2015). Harvest in Washington State is currently less than 100 per year (Don Kraege, pers comm.). Most of the Alaska subsistence harvest (about 12,000 birds) occurs during spring (Rothe et al. 2015) on the Yukon-Kuskokwim Delta (about 8000 birds). From 2002-2011, the adult sex ratio (males:females) of harvested Black Scoters (Atlantic and Pacific combined) was 2.22 in Canada and 2.93 in the US; the age ratio (immatures of both sexes:adult females) was 4.12 in Canada and 2.66 in the US (Rothe et al. 2015).

Priority Information Needs:

1. Improve the quality/data of surveys for sport harvest.
2. Improve subsistence harvest estimates for Alaska.
3. Determine age and sex composition of the Alaska subsistence harvest.
4. Determine whether current rate of harvest is sustainable.

Habitat Requirements: Breeding, molting and winter habitat associations are not well documented. However, based on satellite telemetry and surveys, the locations of several key seasonal areas have been documented; for example, Kuskokwim Shoals, Kvichak Bay and Kamishak Bay in Alaska are important spring and/or fall staging areas; Rose Spit in Haida Gwaii is an important staging area for spring migrants from the south (some birds stage there for up to 6 weeks prior to migrating further north); Kuskokwim Bay and Kvichak Bay are important staging and molting areas (Bowman et al. 2008). On the Yukon-Kuskokwim Delta, Black Scoters nested primarily in shrub edge habitat, especially Dwarf Birch and Alaska Spiraea, and nests averaged 58 m from water (Schamber et al. 2010a). In Bristol Bay, Alaska, the core use area for Black Scoters was ~5.1 km from shore and the average water depth was 2.4 m; this area was used primarily during spring migration and autumn molting (Schamber et al. 2010b). An analysis of sea duck habitat associations, using BC Coastal Waterbird Survey data, is being undertaken by Ducks Unlimited Canada and the Canadian Wildlife Service; results are not yet available for Black Scoters. In the boreal forest of Quebec, breeding Black Scoters selected near-shore areas of lakes and small islands and avoided offshore areas of lakes and flooded swamps and they were more likely to use wetlands with area > 8 ha (Lemelin et al. 2010).

Priority Information Needs:

1. Characterize the breeding habitat in Alaska, and identify the factors responsible for their selection.
2. Characterize the molting habitat in Alaska, and identify the factors responsible for their selection.
3. Characterize the wintering habitat, and identify the factors responsible for their selection.

4. Characterize spring and fall staging habitats, and identify the factors responsible for their selection.
5. Determine whether wintering habitat for Black Scoters is limiting, and where.

Parasites, Disease, and Contaminants: Little is known about parasites, disease, and contaminants. For Black Scoters tested in Alaska, 85% of birds had blood lead levels so low they were classified as undetectable and none had levels above background or "normal" exposure; however, levels were higher in birds collected in areas of higher density human populations (Brown et al. 2006). Avian influenza antibodies were detected in serum of 69% of Black Scoters sampled from Alaska, indicating past exposure, but <5% tested positive for the virus (Wilson et al. 2013). Poxviruses, avian cholera, and chlamydiosis as well as several parasites (*Sarcocystis* sp., *Leucocytozoon* sp., *Hemoproteus* sp.) have been detected in Black Scoters in North America (Hollmen et al. 2015).

Priority Information Needs:

1. Opportunistically screen for diseases and parasites on both the breeding and wintering areas.
2. Opportunistically collect blood and tissue samples to determine contaminant levels, on both the breeding and wintering areas.
3. Expand laboratory studies to determine effects of specific contaminants and exposure levels on physiological functions, reproduction and survival. Particular emphasis should be given to crude oil, heavy metals, and compounds that accumulate in invertebrate foods.

Black Scoter *(Melanitta americana)*

Atlantic Population

Population Size and Trends:
In eastern North America, the total population probably numbers about300,000 birds, but there is little reliable information available to assess long-term trends. Surveys of molting birds in late July and early August along the Hudson and James Bay coast indicate that about 200,000 Black Scoters molt there, nearly all males (Badzinski et al. 2012). Spring migration counts at Point Lepreau, New Brunswick have averaged 152,000 individuals and have been decreasing during 2000-2012 while fall migration counts at Point Avalon, New Jersey have remained stable with an average of 187,000 during 1995-2007 (Bowman et al. 2015). Based on extrapolation from brood and pair surveys, an estimated 25,800 pairs of Black Scoters bred in Quebec while Lepage and Savard(2013) estimated an average of 112,000 Black Scoters present during the breeding season in Quebec in 2004-2007. Recent information from satellite telemetry studies suggests that the region including the Hudson Bay Lowlands, northern Manitoba, southwestern continental Nunavut, and eastern Northwest Territories is an important breeding area for Eastern Black Scoters, but actual numbers that regularly use this area are unknown. The Atlantic Coast Winter Sea Duck Survey estimated an average of 211,300 Black Scoters, based on surveys during January to March, 2008-2011 from the US-Canada border south to Palm Beach, Florida (Silverman et al. 2012). Satellite telemetry data show that unpaired males may migrate directly from wintering to molting areas and also that individuals may use different molting areas in subsequent years; this information should be considered when interpreting survey data and there has been some suggestion that the James Bay Molting Scoter survey should be expanded to include western Hudson Bay and perhaps the St. Lawrence Estuary (SDJV 2014).

Priority Information Needs:

1. Further define breeding distribution and relative densities that would enable a better evaluation of the breeding surveys as one method of providing reliable population trends and estimates for the Atlantic population
2. Evaluate alternative techniques (e.g., breeding vs wintering vs molting) to provide reliable estimates of population size and trend in eastern North America.
3. Develop or refine techniques to estimate detection rates during aerial surveys.
4. Develop training tools and a protocol for identifying scoters to species during aerial surveys on breeding, molting, and wintering areas.

Population Delineation: Most Black Scoter females marked with satellite transmitters in Chaleur Bay, New Brunswick/Quebec migrated to breeding areas from the Hudson Bay coast of Manitoba almost to Great Slave Lake, much further west and north than previously thought. Eastern Black Scoters appear to have two major breeding areas – the Hudson Bay Lowlands/northern Manitoba/ southwestern continental Nunavut/eastern Northwest Territories and north-central Quebec/Labrador (SDJV 2014). Male Black Scoters marked in Chaleur Bay used two primary molting areas – western Hudson Bay and James Bay, with individuals also molting in the St. Lawrence Estuary, coastal Labrador, Chaleur Bay, and Bay of Fundy (SDJV 2014). James Bay was an important fall staging area prior to a southward migrationto wintering areas between Nova Scotia to northern Florida (SDJV 2014).

Data from multiple years indicate that females have high return rates to nesting areas; 12 females used the same breeding site for 2 consecutive seasons, 2 females for 3 consecutive seasons and 1 female for 4 consecutive seasons and average movement between breeding sites was 3.25 km (SDJV 2014). Male Black Scoters also showed fairly high return rates to molting areas – 6 of 15 tagged males returned to the same molting site for 3 consecutive years while 7 switched areas at least once (SDJV 2014). Conversely, preliminary analyses indicate significant movement within and between years during winter (SDJV 2014). Loring et al. (2014) also found that less than half of the satellite-tagged birds wintering along the southern New England shelf returned to the same region in the following year while half travelled to other major wintering locations such as Delaware Bay, Chesapeake Bay and coastal North Carolina. Of those that returned to New England, only 33% used the same core-use areas during the subsequent winter (Loring et al. 2014). For Black Scoters, capture and/or surgical implantation of satellite transmitters appears to delay migration and movements in year of capture, so location data should be interpreted cautiously (SDJV 2014).

Priority Information Needs:

1. Augment sample sizes of radio-marked birds in the Atlantic to improve the portrait of breeding and molting areas associated with various wintering areas.
2. Determine the level of annual fidelity to breeding, molting and wintering habitats.
3. Determine seasonal movements of non-breeding birds.
4. Opportunistically collect tissue samples for genetic analyses for Black Scoters.
5. Opportunistically collect tissue and food samples for stable isotope analyses to help determine seasonal habitat use at a broad geographic scale.

Population Dynamics: Virtually no data available for the eastern population.

Priority Information Needs:

1. Determine age-specific survival rates of ducks from various breeding and wintering areas.
2. Determine factors affecting the reproductive rates and variation in those rates for ducks from different breeding areas.
3. Assess the feasibility to determine the age structure of wintering populations.
4. Develop a demographic model for the species.

Population Ecology: Breeding, molting, migration, and wintering ecology needs to be better documented. Few data have been collected on food habits and feeding ecology during breeding molting, and wintering areas.

Priority Information Needs:

1. Determine important factors (weather, predators, food, etc.) affecting survival and reproductive success (fitness) of the species throughout its range

Harvest Assessment: The sport harvest is low in comparison with apparent overall population levels. From 1999 to 2008, the total US sport harvest averaged 10,799, with 84% in Atlantic Flyway and the Canadian harvest averaged 2,864, almost all in eastern Canada (Baldassare 2014). The Canadian subsistence harvest was estimated at 12,000 (SDJV 2007), with the 2006 Cree subsistence harvest in Quebec estimated at 8,400 (Lepage and Savard 2013) and the Innu subsistence harvest in Quebec was estimated at 1,350 for fall and spring 2012. Low numbers of Black Scoters are harvested by Inuit in Sanikiluaq, Belcher Island, Nunavut; the average annual harvest over a 5-year period (1996-2000) was 5 birds (Nunavut Harvest Study 2004). Subsistence harvest in the Northwest Territories is unknown, but likely insignificant because there are no communities near the core breeding range. The amount of subsistence harvest on this population in Manitoba, Ontario and Labrador is unknown. From 2002-2011, the adult sex ratio (males:females) of harvested Black Scoters was 2.22 in Canada and 2.93 in the US; the age ratio (immatures of both sexes:adult females) was 4.12 in Canada and 2.66 in the US (Rothe et al. 2015).

Priority Information Needs:

1. Improve the surveys for sport harvest
2. Improve subsistence harvest estimates in eastern and northern North America.
3. Determine sustainability of harvest

Habitat Requirements: On the southern New England continental shelf, wintering Black Scoters used areas closer to shore (~4 km), with shallower water depth (~13-15 m), coarser sediment grain size, and higher probability of hard-bottom relative to available areas (Loring et al. 2014) and in Narragansett Bay, Rhode Island, highest densities of scoters (all three species) were found in areas with sand substrates and homogenous assemblages of infaunal prey (Loring et al. 2013). Winter utilization distributions of individuals ranged from <20 to >10,000 km^2 (Loring et al. 2014). Black Scoter breeding in northern Quebec used shallow (>5 m), medium-sized (10 – 30 ha) lakes and avoided rivers and large lakes; they generally were not found in forested areas and chose locations of more open tundra and lower elevation than Surf Scoters in the same region. In the Hudson Bay Lowlands of Ontario, breeding scoters (all three species) were more abundant in areas with higher density of small wetlands (<100 ha) (Brook et al. 2012).

Chaleur Bay, New Brunswick/Quebec is used as a spring staging area by most of the eastern population, and most females also staged in James Bay before continuing to breeding areas (SDJV 2014). James Bay and southwestern Hudson Bay were used by Black Scoters from May to late November (i.e. most of the ice-free period), indicating that these are likely important areas for nutrient/energy acquisition (SDJV 2014).

Priority Information Needs:

1. Characterize the breeding habitat in Canada, and identify the factors responsible for their selection by Black Scoters.
2. Characterize the molting habitat in Canada, and identify the factors responsible for their selection by Black Scoters.
3. Characterize the wintering habitat, and identify the factors responsible for their selection by Black Scoters.
4. Characterize spring and fall staging habitats, and identify the factors responsible for their selection by Black Scoters.
5. Determine whether wintering habitat for Black Scoters is limiting, and where.
6. Evaluate existing satellite telemetry and survey data to determine whether any key staging, wintering, or molting areas warrant additional protective measures.

Parasites, Disease, and Contaminants: Little is known about parasites, disease, and contaminants in the Black Scoter. Black Scoters were among the species killed by an outbreak of avian cholera in Chesapeake Bay in 1978 (Montgomery et al. 1979). Poxviruses, avian cholera, and chlamydiosis as well as several parasites (*Sarcocystis* sp., *Leucocytozoon* sp., *Hemoproteus* sp.) have been detected in Black Scoters in North America (Hollmen et al. 2015).

Priority Information Needs:

1. Opportunistically screen Black Scoters for diseases and parasites on both the breeding and wintering areas.
2. Determine contaminant levels, on both the breeding and wintering areas.
3. Expand laboratory studies to determine effects of specific contaminants and exposure levels on physiological functions, reproduction and survival. Particular emphasis should be given to crude oil, heavy metals, and compounds that accumulate in invertebrate foods.

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