Swan Lead Poisoning Information Sheet

2008-2009 Progress Report

Background
Since 1999, Trumpeter and Tundra Swans wintering in northwestern Washington and southwestern British Columbia have experienced high rates of mortality. Most of the mortalities have been due to the ingestion of lead shot pellets. The use of lead shot for waterfowl hunting has been banned in Whatcom County, Washington since 1989 and in the Sumas Prairie, British Columbia since 1992. Lead shot, however, continues to be permitted on some upland hunting areas and unregulated trap shooting on private lands.

Representatives from Environment Canada's Canadian Wildlife Service (CWS), the Washington Department of Fish and Wildlife (WDFW), the U.S. Fish and Wildlife Service (USFWS), the Trumpeter Swan Society, the Washington Cooperative Fish and Wildlife Research Unit at the University of Washington and various other organizations have been working together since 2001 to locate the source(s) of lead shot and end or at least minimize swan mortalities.

The Pacific Trumpeter Swan population as a whole is not at risk because of the lead shot mortalities. Although an average of 285 swans have died annually in the Sumas-Whatcom County area since 1999, both the local winter population and the larger Pacific Coast Trumpeter Swan breeding population have continued to increase.

Investigation of swan activities
To help pinpoint the sources of lead shot pellets causing swan deaths, biologists captured swans and tested blood lead levels, mounted radio-collars and monitored swan movements to locate day-time terrestrial foraging areas and night-time roost sites. In the agricultural area along the British Columbia-Washington border, swans tend to forage in farm fields and roost on small lakes or fields with standing water. From 2001-2005, 315 Trumpeter and Tundra Swans were trapped and blood samples were collected for lead residue analysis. Of those, 249 Trumpeter Swans were also outfitted with VHF radio transmitters (n=243) or satellite transmitters (n=6); 61 Tundra Swans were fitted with neck collars. Locations of the radio-tagged swans were recorded each day and night.

In most years, roadside counts of swans were conducted in Whatcom County and Sumas Prairie twice per week from November through January. Sick and dead swans were collected, carcasses were examined to determine cause of death and gizzard contents were identified. Of the 2,062 carcasses collected from 2000-2008, the majority of deaths were lead-related (77%). An average of 19 lead and 8 steel pellets were recovered per gizzard of lead-exposed swans (n=1,594 gizzards, 41,404 pellets).

Surveys for lead shot
Between 2001 and 2004, areas of high swan use were assessed for lead shot. This was done by collecting soil cores at 14 forage fields in the Sumas Prairie, 8 roost sites (4 in Sumas Prairie, 4 in Whatcom County), and 6 temporary roost sites in Whatcom County. Sampling was conducted at roosts and in the sections of the fields which were recently and actively hunted. Lead shot was found in 5 of the 14 forage fields, 5 of 8 permanent roosts, and all 6 temporary roost sites sampled. Lead shot densities were highest in the forage fields, followed by permanent roosts and then temporary roosts. The fields with the highest shot densities were not used in subsequent years by significant numbers of marked swans that succumbed to lead poisoning. Therefore, these fields are not suspected of being a major source of lead pellets.

In 2005/2006, the University of Washington collected cores in the primary area of interest (~243 ha of forage fields near the US/Canada border) as well as in Judson Lake (~40 ha lake spanning the border and a common roost site for swans throughout the winter). Field sampling was limited to corn fields with grass cover crop because these were extensively used by some collared swans that died of lead poisoning. In total, 4,506 cores (3,429 from the area of interest, 1,077 from Judson Lake) were collected in a grid pattern. Results indicate that the U.S. side of Judson Lake contains the highest lead shot density of all roosts sampled in our study and the forage fields sampled in 2005-06. It was only slightly higher than another Canadian roost.

Hazing Activities
Because of the relatively high densities of lead shot on the U.S. side of Judson Lake, an adaptive management approach was undertaken in 2006/2007 to test the hypothesis that this roost site could be a major source of lead shot. Hazing activities were conducted to keep swans off the lake from their arrival in early November through January, and this coincided with an at least a, and likely greater than, 50% reduction in lead-caused swan mortalities when compared to the previous 5-year average (2001-06). Interpretation of these data was complicated by both early flooding, which potentially shifted swan habitat use within the study area, and heavy snow storms which forced swans out of the study area during the window of exposure. Hazing, therefore, was repeated in 2007/2008 and this again resulted in at least a, and likely greater than, 50% reduction in lead-caused swan mortalities.

Population surveys conducted in 2006/2007 and 2007/2008 showed that fewer swans foraged in an agricultural area of particular interest to the investigative team. It was possible that some of the decrease in lead-caused mortalities observed in those years may have been related to the decreased use of this area. However, core sampling conducted in 2007/2008 determined that the area was unlikely to be a significant source of lead shot.

In 2006/2007 and 2007/2008, we observed a higher number of lead-related swan mortalities on roost lakes further to the south, in Skagit and Snohomish Counties of Washington State, compared to past years (annual average, 1999-2006: 19 swans; annual average, 2006-2008: 49 swans). It is possible that some of the increase in lead-related swan mortalities in the Skagit and Snohomish Counties may be attributable to increasing swan populations in those counties.

Swan populations in the Sumas Prairie and Whatcom County will be surveyed weekly through the winter and a (one-time) mid-winter survey flight of the Sumas Prairie and Whatcom, Skagit and Snohomish Counties will be conducted. Swan mortalities will continue to be monitored and core sampling may be conducted in 2008/2009 to help clarify the relative importance of roost sites in Skagit and Snohomish Counties and Judson Lake as sources of lead shot.

Conclusions
It remains our primary goal to locate and reduce and eliminate swan mortalities due to ingestion of lead shot. Hazing swans off Judson Lake resulted in a relatively large (50%+) reduction in the number of swans dying from lead shot ingestion. Judson Lake has also been part of a broader discussion regarding its stressed ecological condition; hence, this roost site is an obvious candidate for long-term restoration. Environment Canada – Canadian Wildlife Service, BC Ministry of Environment, and Ducks Unlimited Canada have agreed to consider the ecological condition of the lake, and develop options to address long-term habitat management goals at the lake. In 2008/2009, hazing of Judson Lake will continue and medium-term mitigation strategies to prevent swans from accessing lead at the lake will be investigated. Effective, alternate strategies would then be undertaken until long-term measures can be implemented. However, the ability of the working group to provide support for the project will be contingent on funding.

More information:

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THE TRUMPETER SWAN SOCIETY

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