STATUS OF BREEDING BLACK OYSTERCATCHERS *HAEMATOPUS BACHMANI* IN THE SALISH SEA

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SUMMARY

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Collaboration across jurisdictional boundaries using common survey standards for Black Oystercatchers *Haematopus bachmani* has provided an opportunity to estimate population status in the Salish Sea. Our results indicate that the 2005/06 breeding population of Black Oystercatchers in the Salish Sea was about 210 nesting pairs. Standardized surveys at selected locations can be useful in monitoring trends in the breeding population through time. Continued federal, state and provincial collaboration is recommended on this and other inventory and monitoring programs for species that cross jurisdictional boundaries. Most oystercatcher nesting sites in the Salish Sea are protected through restricted public access and conservation-focused management, although potential threats to nesting sites remain.

Key words: Black Oystercatcher, *Haematopus bachmani,* breeding population, British Columbia, Washington, conservation status

INTRODUCTION

The Black Oystercatcher *Haematopus bachmani* is a large, long-lived shorebird with a global population estimated at between 8900 and 11 000 birds, though no range-wide systematic survey has targeted oystercatchers (Tessler *et al.* 2007). The Black Oystercatcher occurs at low densities along the Pacific coast from the Aleutian Islands to Baja California (Andres & Flaxa 1995). Although this species is one of the least abundant shorebirds in North America, interest among conservation agencies to use the Black Oystercatcher as an indicator of coastal ecosystem health is growing (Tessler *et al.* 2007).

In British Columbia, Vermeer *et al.* (1989) conducted surveys in 1987 for nesting Black Oystercatchers in the Strait of Georgia. Butler & Golumbia (2008) repeated those surveys in 2005 and 2006. Hazlitt (2001) suggested that the Strait of Georgia population was undergoing an increase, and Butler and Golumbia (2008) suggested that from 1989 to 2006 oystercatcher numbers in the Strait of Georgia were stable or slightly increasing, with possible modest declines in the south. In Washington State, oystercatcher surveys on inside marine waters (San Juan Islands and Puget Sound) were conducted in the 1970s (Nysewander 1977) and in 2000–2004 and 2006 by the Washington Department of Fish and Wildlife [WDFW (Tessler *et al.* 2007, Milner & Nysewander unpubl. data)]. Numbers appeared to be stable, although long-term surveys using standardized methodologies have not been conducted (D. Nysewander pers. obs.).

Given the recognized linkages between Canadian and American waters of the Salish Sea, interest in assessing conservation status and coordinating management efforts across jurisdictional boundaries is increasing. In response, interested conservation agencies formed the Black Oystercatcher Working Group to increase cross-border communication and to assess the status of oystercatcher populations in the Salish Sea. Survey data on active nesting sites in the area during 2005/06 were combined. In addition, nesting locations were identified by land ownership status and assessed for adequacy of existing conservation measures. Common data standards provide an opportunity to examine both the population trends of breeding birds and their conservation status. This baseline will support future analyses of trends if standard survey methods and consistent effort are maintained.

METHODS

To assess the status of the Black Oystercatcher population in the Salish Sea, we visited all suitable nesting islands between 2005 and 2006, counting breeding birds and making observations on non-breeders (Tessler *et al.* 2007, Butler & Golumbia 2008, R. Milner & D. Nysewander unpubl. data).

Vermeer *et al.* (1989) showed that suitable nest sites for oystercatchers in the Strait of Georgia were small islands uninhabited by humans, with few or no trees and extensive barren ground. Breeding oystercatchers on such islands can easily be counted from a boat or on foot. We therefore conducted a rapid assessment of the available shoreline areas and defined potentially suitable Black Oystercatcher breeding habitat. We focused our survey effort to cover all nearby shorelines in proximity to those areas. We visited all known nesting sites and any small, bare, rocky islands with little vegetation that potentially were good nesting sites in the Strait of Georgia and Gulf

Islands in British Columbia, and Puget Sound and the San Juan Islands in Washington State. Butler & Golumbia (2008) describe in detail the methods used in British Columbia. Briefly, we landed on most islands that looked suitable for nesting to search for nests, eggs and chicks. On islands that were not accessible in British Columbia, and at Washington State sites, we searched for oystercatchers from offshore using a small inflatable boat or viewing from an elevated position on a 4.5-m shallow-draft vessel.

Surveys in British Columbia were conducted in the first two weeks of June 2005 and 2006. Sites were normally visited once. A repeat visit was made to sites at which no detections were made on the first visit. In 2006, surveys in Washington State were conducted during the last two weeks in May and the first two weeks of June, for a total of three visits per site. Each site was surveyed at various points in the tide cycle to maximize the likelihood of seeing birds and reliably classifying their behaviour. During the June visits, call playback tapes were used at all sites that still needed confirmation of nesting.

Islands were categorized as having active nesting if we saw eggs or chicks, copulating pairs, or pairs that displayed behaviours such as injury feigning, squatting, uttering alarm or "whinny" calls while flying toward us, or pipping in the presence of other oystercatchers—all of which indicate territorial and nesting behaviour (Andres & Falxa 1995). Groups of non-breeding birds were also noted throughout the survey period. Birds showing no defensive behaviour or site fidelity were categorized as non-breeders.

In BC waters, we searched western regions between the Chain Islands in Oak Bay (48°23′58″N, 123°19′01″W) in the south and Porlier Pass (49°0′46″N, 123°35′27″W) in the north (Butler & Golumbia 2008). Along the eastern shore of the Strait of Georgia, we visited islands between Vancouver and Cortez Island (50°06′44″N, 124°56′58″W). Nesting islands near Nanaimo were not surveyed, but data from 1997 and 1999 [M. Lemon (Canadian Wildlife Service, Delta, BC) unpubl. data] have been incorporated here for completeness. We did not survey Saanich (48°38′42″N, 123°30′07″W) and Jervis (49°48′56″N, 123°55′13″W) inlets or Indian Arm (49°20′07″N, 123°54′29″W), where small islands are few and quality nesting habitat is highly limited. Breeding oystercatchers at Trial Island (48°23′53″N, 123°18′20″W), Race Rocks (48°17′53″N, 123°31′53″W) and elsewhere in western and central Juan de Fuca Strait are not included in this summary.

In Washington State waters, we surveyed the San Juan Archipelago, including the Bellingham Bay area (48°38′40″N, 123°32′58″W), as well as Deception Pass, waters in the vicinity of La Conner, and the northern portion of Whidbey Island (48°22′54″N, 123°33′32″W). With rare exceptions, oystercatchers are not observed in south or central Puget Sound (D. Nysewander pers. obs.), and those areas are excluded in this analysis. Smith Island (48°19′08″N, 122°50′40″W) in the eastern Strait of Juan de Fuca was also examined and is included in this summary, but breeding oystercatchers on Protection Island (48°07′37″N, 122°55′57″W) and Dungeness Spit (48°10′28″ N, 123°08′05″W) in the southeastern Strait of Juan de Fuca were considered outside of the study area and are excluded from the analysis.

In addition to the field surveys, identified nesting sites were assigned a conservation status in both Washington State and British Columbia. This status was assigned by each jurisdiction based on property ownership, land use and recognized conservation management.

RESULTS AND DISCUSSION

Population status

Surveys detected 210 active nesting sites throughout the Salish Sea study area (Fig. 1). In addition to nesting pairs, 29 birds in British Columbia and 112 birds in Washington State were counted as non-breeders. Based on these results, our surveys indicate that the overall oystercatcher population in the Salish Sea during 2005/06 included at least 420 breeding birds and 141 non-nesting individuals. Because non-breeders may have moved between sites on different survey days, they may have been counted twice, and our estimate of their numbers may be high. Results from the single-visit surveys in British Columbia should be taken as a conservative estimate of total population size. An important source of error in estimates of nesting pairs based on single visits stems from observers overlooking pairs hidden from view or omitting oystercatchers that were temporarily off the nesting islands. We did not measure our detection error, but Hazlitt (1999) estimated that the error associated with single visits is about 32%. Because of the paucity of systematic survey data from years before studies reported here, population trends of Black Oystercatchers in the Salish Sea cannot be assessed.

Conservation status

Many important breeding areas of Black Oystercatchers are known in the Salish Sea, including the southern Gulf Islands and San Juan Islands, as well as portions of Deception Pass, Bellingham Bay, the Oak Bay Islands and Smith Island. In recognition of the importance of these nesting sites to Black Oystercatchers and other species,

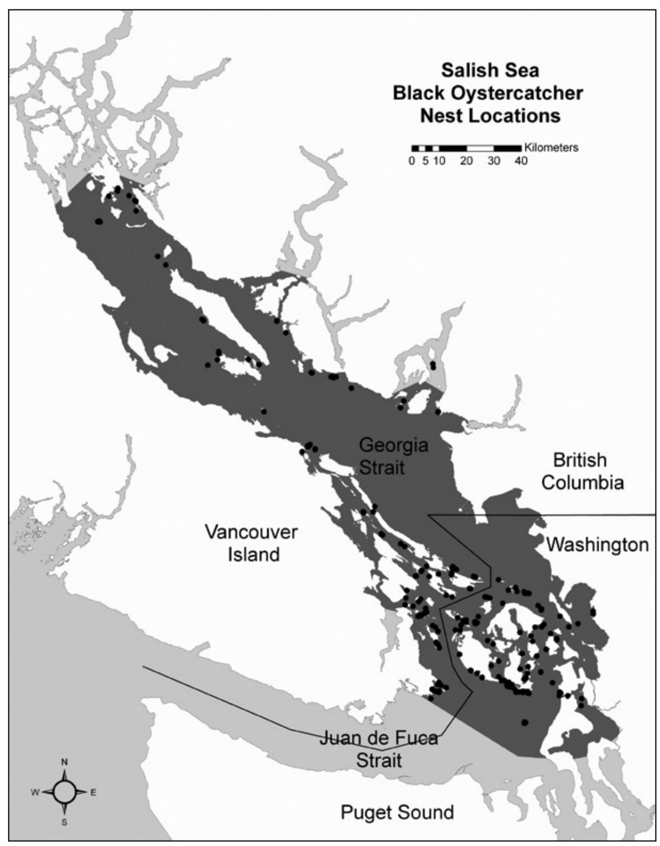

Fig. 1. Black Oystercatcher *Haematopus bachmani* nest locations (filled circles) in the Salish Sea. Area surveyed is depicted in dark gray.

many have been acquired by government agencies, which use a range of measures for protection and management (Table 1). Of 210 sites, 154 (73%) occur on lands with a conservation focus or, at a minimum, controlled access. A "high" level of conservation or protection is accorded to 66% of sites (n = 139) because they are on lands with controlled access and a specific conservation mandate. An additional 31 sites (15%) have a "moderate" level of protection, with either restricted access or a conservation mandate, but not both. The remaining 40 sites (19%) have "limited" protection, no protection or an unknown protection status.

Based on land management status and public access restrictions, the San Juan Islands National Wildlife Refuges protect 77 of the nesting sites (37%). Gulf Islands National Park Reserve protects 38 of the sites (18%). In recognition of oystercatcher nesting requirements and other sensitive features on small islets in Gulf Islands National Park Reserve, Parks Canada closed several nesting islets to year-round public access in 2006 (Parks Canada 2006). Similarly, BC Ecological Reserves restrict access and protect 16 (8%) of the identified nesting sites.

Although 25 of nesting sites (12%) reside within state or provincial parks, only one park (North Finger Island State Park, San Juan Islands, WA) receives specific conservation management through area closures. A large number of nesting sites are found on government lands without specific conservation goals or on private land to which access is restricted, but conservation goals may not be established. An exception is private land owned or managed primarily for conservation by The Nature Conservancy [7 nesting sites (3%)]. Long-term monitoring of nesting activity should provide an indication of conservation success on protected compared with non-protected sites. Periodic targeted research may be an appropriate addition to annual counts.

Increasing human population in the region (Anonymous 2002), along with associated increases in recreation and tourism, may lead to increasing nest failure (Morse *et al.* 2006, Tessler *et al.* 2007). Nysewander (1977) suggested that certain types of access by foot on islands would drive adults from defending their nests. When adults leave the nest unattended, eggs and chicks, though cryptically coloured, are more likely to be lost to predators (e.g. corvids). Restricted access limits disturbance (trampling, pets, human presence), but a number of potential threats to nesting oystercatchers remain. For instance, increasing presence of predators (Bald Eagles *Haliaeetus leucocephalus,* Glaucous-winged Gulls *Larus glaucescens* and mammals such as River Otters *Lutra canadensis* and Raccoons *Procyon lotor*) may negatively influence nesting activity (Vermeer 1989, Sabine *et al.* 2006, Tessler *et al.* 2007). Some sites known to have supported nesting birds historically are unused at present. For example, Black Oystercatchers no longer nest on some sites in the southern Gulf Islands where raccoons have colonized or where development has occurred (T. Golumbia pers. obs.). Further investigation is needed.

Increased vessel traffic (commercial shipping and recreational boating) raise the risk to oystercatchers of low-level impacts from wake wash during high tides and the potential for impacts from large-scale events such as oil spills (Tessler *et al.* 2007). Estimates of population status and trends, and identification of active and potential nesting habitat will be of critical importance in measuring responses to such potential stressors. At present, it would appear that many active nesting sites are favourably managed. However,

TABLE 1
Black Oystercatcher *Haematopus bachmani* active nesting sites detected in the Salish Sea, classified by jurisdiction, land use status, control of public access, management class and conservation status

Management class	Level of protection	Land use status	Jurisdiction	Controlled access		Total active nests
				No	Yes	
Conservation reserve	High	Ecological reserve	BC		16	16
	High	Migratory bird sanctuary	WA		1	1
	High	National park reserve	BC		38	38
	High	San Juan Islands National Wildlife Refuge	WA		77	77
Park	Low	Municipal park	BC	2		2
	Medium	Provincial park	BC	2		2
	Medium	State park	WA	12	1	13
Government land	Low	Crown islet	BC	7		7
	Medium	Indian reserve	BC		4	4
	Medium	State department of natural resources	WA	2		2
	Low	US Bureau of Land Management	WA	6		6
Private	High	Nature conservancy	WA		7	7
	Low	Private	BC+WA	5		5
	Medium	Private	BC+WA		10	10
Unknown	Low	Unknown	BC+WA	20		20
Total				56	154	210

the Black Oystercatcher Working Group recommends further work comparing occupancy patterns against habitat suitability, availability and management regimes across the region.

Future surveys

Adhering to standard survey protocols across the Salish Sea region will facilitate monitoring of breeding population trends (Tessler *et al.* 2007). On the BC coast, Canada's National Parks are adopting standard protocols for surveying oystercatchers. Repeat surveys at selected locations will be used in Gulf Islands National Park Reserve for monitoring trends in the breeding population through time. Power analysis using historical data (1993–2006) from Laskeek Bay in Haida Gwaii (Queen Charlotte Islands) indicates that detection of a 2.4% or greater annual change in the number of breeding pairs (12% change over five years) is possible if surveys are conducted annually (Bartier *et al.* 2007). As repeated surveys are conducted in the Salish Sea, similar analyses will help to refine monitoring protocols and identify appropriate thresholds for management action. Audio playback—using oystercatcher call notes to elicit responses from nesting birds—is under evaluation by the WDFW (D. Nysewander & R. Milner unpubl. data) for possible use in future surveys. Continued international collaboration is recommended in support of these and other inventory and monitoring programs.

Inventories of Black Oystercatchers in the Salish Sea and elsewhere have highlighted the need to investigate productivity at the local level while also evaluating larger movement patterns across the breeding range of oystercatchers. Surveys of nesting areas on the outer coasts of Vancouver Island and Washington, and continued surveys within the Salish Sea, may elucidate relationships among these nesting areas and their relative importance to regional population dynamics (Tessler *et al.* 2007).

Understanding of winter habitat use and seasonal movements within and among nesting areas is limited. At present, coordinated banding of adults and chicks is being undertaken to provide information on those topics. Webster *et al.* (2002) note that advances in telemetry, molecular population genetics and stable isotope analysis can further an understanding of migratory connectivity, including ecological and evolutionary relationships between populations of migratory birds. In summer 2009, biologists with the WDFW will deploy very-high-frequency transmitters on 20 adult oystercatchers, with captures planned to occur primarily in the San Juan Islands (unpubl. data). Although no genetic or stable isotope studies are currently proposed, such approaches would also be useful in establishing relationships between birds within and adjacent to the Salish Sea.

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