

CASSIN'S AUKLET

Ptychoramphus aleuticus

Original¹ prepared by Anne Harfenist

Species Information

Taxonomy

The Cassin's Auklet is a member of the family Alcidae, the auks, and is the only species in the genus *Ptychoramphus*. According to mitochondrial DNA evidence, it is most closely related to the other genera of Pacific planktivorous auklets, *Aethia* and *Cyclorhynchus* (Friesen et al. 1996). There are two subspecies of Cassin's Auklet: *Ptychoramphus aleuticus aleuticus* and *P. aleuticus australe* (Manuwal and Thoresen 1993). *P. aleuticus aleuticus* is found over most of the species' range from Alaska to Guadalupe Island in Baja California; *P. aleuticus australe* is the more southern form.

Description

The two subspecies are almost identical in appearance although the more southerly birds are smaller in length and mass (Manuwal and Thoresen 1993). For the *aleuticus* subspecies, adult length is ~23 cm, wing length is about 125 mm (Nelson 1981), and adult mass is 150–200 g (Manuwal and Thoresen 1993). There is a significant clinal increase in body size from Baja California through California (Manuwal and Thoresen 1993); birds from British Columbia and Alaska are similar to California birds (Gaston and Jones 1998). Within British Columbia, birds breeding on Frederick Island have a longer mean tarsus length than those breeding on Triangle Island. However, too few data exist to determine whether other measurements of the Frederick Island birds are also larger (A. Harfenist, unpubl. data).

The Cassin's Auklet is a small grey seabird with short, broad rounded wings and chunky body shape (Manuwal and Thoresen 1993; Gaston and Jones 1998). Males and females are similar in appearance and the plumage does not change during the year.

The upper parts are dark grey and the underparts are dark grey shading to paler grey with a white belly. There is a white crescent above and below each eye; the upper crescent is more prominent. The short pointed bill is black; legs and feet are blue. Iris colour changes with age: chicks have a brown iris which gradually change to the silver-white colour found in adults; the irides of intermediate-aged birds are usually a combination of brown and silver (Manuwal 1978).

Juveniles are generally paler than adults and have a white throat. Nestlings are covered with grey down over most of the body with white down on the belly until they develop feathers.

Distribution

The Cassin's Auklet spends almost its entire life on the ocean, coming to land only to breed through most of its range.

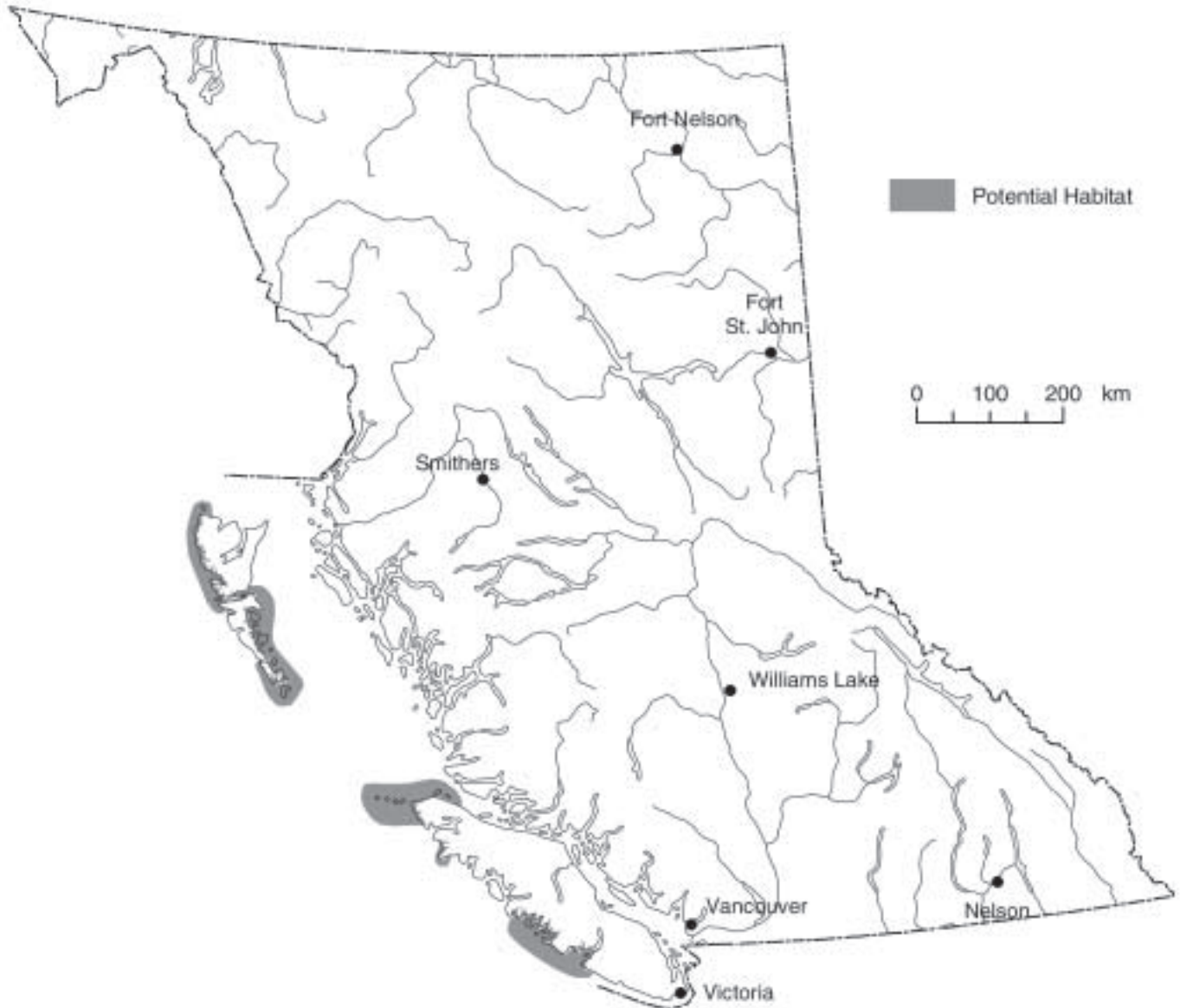
Global

The breeding range of the Cassin's Auklet extends from the middle of Baja California north along the west coast of North America to southeast Alaska and along the south coast of the Alaska Peninsula west along the Aleutian Islands (Manuwal and Thoresen 1993; Gaston and Jones 1998). No Cassin's Auklet colonies have been reported from Kodiak Island to Prince William Sound in the Gulf of Alaska despite the availability of suitable nesting habitat (Manuwal and Thoresen 1993; Gaston and Jones 1998). The at-sea distribution of the birds during the breeding season covers approximately the same geographic range.

The winter range of the Cassin's Auklet extends farther offshore into deeper oceanic waters than

¹ Volume 1 account prepared by A. Derocher.

Cassin's Auklet (*Ptychoramphus aleuticus*)



Note: This map represents a broad view of the distribution of potential habitat used by this species. The map is based on current knowledge of the species' habitat preferences. This species may or may not occur in all areas indicated.

does the summer range (Gaston and Jones 1998). In addition, the birds winter along the entire western coast of the Baja Peninsula. They do not seem to winter in southeast Alaska.

British Columbia

The Cassin's Auklet breeds at 61 colonies on offshore islands along the western and northern coasts of Vancouver Island, the northern mainland coast and the Queen Charlotte Islands/Haida Gwaii (Rodway et al. 1988, 1990a, 1990b, 1994; Rodway and Lemon 1990, 1991a, 1991b). The largest breeding colony in the world is at Triangle Island in the Scott Island group off northwestern Vancouver Island (Manuwal and Thoresen 1993). The marine distribution includes the entire B.C. Coast during the breeding season and all but perhaps the waters around the northwestern side of the Queen Charlotte Islands/Haida Gwaii archipelago in the winter (Campbell et al. 1990; Gaston and Jones 1998). There are no records from the Interior of British Columbia (Gaston and Jones 1998).

Forest region and districts

Coast: Campbell River, North Coast, North Island, Queen Charlotte Islands, South Island

Ecoprovinces and ecoregions

Nesting:

COM: HEL, NCF, NWL, QCT, SKP, WIM, WQC

At-sea:

COM: DIE, HES, JOS, NCF, QCS, QCT, VIS

GED: JDF, SOG

NOP: SAP, TRP

Biogeoclimatic units (nesting)

CWH: vh1, vh2, vm1, wh1

Broad ecosystem units

CH, HS

Distance to ocean

Throughout their range, most burrows are within 500 m of the ocean (Gaston and Jones 1998). On the Queen Charlotte Islands/Haida Gwaii and northern mainland coast, most burrows are within 30 m of

the outer vegetation edge (Campbell et al. 1990; Rodway and Lemon 1991a); on Triangle Island, burrows extend several hundred metres inland (Rodway et al. 1990b).

Life History

Diet and foraging behaviour

Cassin's Auklets are planktivores that feed mainly on macrozooplankton (primarily copepods and euphausiids) and larval fish (e.g., Vermeer et al. 1985; Manuwal and Thoresen 1993; Hedd et al. 2002). The diet of Cassin's Auklets varies across its range and significant interannual variation has been observed at some sites (Manuwal and Thoresen 1993; Gaston and Jones 1998). Diet studies carried out on Triangle and Frederick islands in 1994–1998 found that copepods (mainly *Neocalanus cristatus*), euphausiids (primarily *Euphausiia pacifica*, *Thysanoessa spinifera*, *T. inspinata*) and larval fish (including *Sebastes* spp., *Ammodytes* spp.) comprised 90–99% of the diets by mass (Hedd et al. 2002; A. Harfenist, unpubl. data). Other items in the diet included amphipods, brachyurans, and carideans. The relative importance of each prey type varied between years, but the diet of birds on Frederick Island included higher percentages of copepods and euphausiids and a lower percentage of fish than that of auklets nesting on Triangle Island. Chick growth was depressed on Triangle Island when copepods were replaced in the diet by larval rockfish (Hedd et al. 2002). At three colonies in the Queen Charlotte Islands/Haida Gwaii in the 1980s, copepods (*N. cristatus*), and euphausiids (*T. pinifera*, *T. longipes*) dominated the diet (Vermeer et al. 1985).

Almost all of the information about diet of the Cassin's Auklet is from studies of the food that adults bring back to their nestlings at the colony; the overlap between the diet of nestlings and that of adults and non-breeding birds is unknown. Chick meal sizes averaged 26–27 g over 2 years on Triangle Island.

Cassin's Auklets forage solely in marine waters, usually in areas of cold upwellings near the continental shelf break or over seamounts (Vermeer et al. 1985; Manuwal and Thoresen 1993). Birds nesting

on Triangle Island foraged 30–90 km from their colony in waters >1500 m deep (Boyd et al. 2002). Their foraging behaviour is described as pursuit diving and they use their wings to propel them under water as they dive to depths of 20–80 m (Burger and Powell 1990). Cassin's Auklets usually feed in small groups but occasionally forage in large flocks (Manuwal and Thoresen 1993). They feed during both day and night (Manuwal and Thoresen 1993). During the breeding season, adults transport captured prey back to their chicks in a specialized throat pouch.

Reproduction

Cassin's Auklets nest in burrows at colonies of up to over 500 000 pairs (Manuwal and Thoresen 1993). The timing of reproduction varies across the species' range: in British Columbia peak laying is from late March–late April, peak hatching from late April–late May and peak fledging from early June–early July (Gaston and Jones 1998). Timing is delayed in warm water El Niño years (Bertram et al. 1999). In the Queen Charlotte Islands/Haida Gwaii, birds nesting off the southeast coast tend to breed about 2 weeks earlier than those nesting off the northwest coast (Vermeer et al. 1997). Breeding is earlier and more extended in the southern part of the birds' range: in Baja California breeding begins in late November and continues over a 6-month period (Jehl and Everett 1985).

Cassin's Auklets can begin breeding at 2 years of age, but most do not begin before 3 years of age (Speich and Manuwal 1974). Cassin's Auklets lay one egg per year, except during exceptional conditions on the Farallon islands in California where pairs can raise two broods in a year (Manuwal 1979). Incubation usually begins immediately after laying and is shared by both parents; incubation typically lasts about 38–39 days (e.g., Ainley and Boekelheide 1990; Manuwal and Thoresen 1993). Chicks are semi-precocial and are brooded in the nest for about 4 days. Following the brooding phase, adults return to the burrows only at night to feed the nestlings. There is significant intercolony and interannual variation in nestling growth rate: growth at Triangle

Island (3.5–5.4 g/day) was lower than that at Frederick Island (5.0–5.7 g/day) over 5 years of study (Hedd et al. 2002; A. Harfenist, unpubl. data). Nestling growth was reduced during an El Niño year on Triangle Island, but not on Frederick Island (Bertram et al. 1999). The nestling period averages ~45 days in British Columbia (Gaston and Jones 1998). In most years, chicks fledge at an average mass of 162–175 g in British Columbia (Vermeer and Lemon 1986; Vermeer et al. 1997; Gaston and Jones 1998; Hedd et al. 2002). However, in a poor growth year, fledging mass averaged 126 g on Triangle Island. Chicks depart from the colonies at night unaccompanied by their parents.

Productivity is between 0.5 and 0.7 fledged chicks per breeding pair per year at most colonies in most years (Gaston and Jones 1998). Hatching success is difficult to measure because disturbance during incubation can cause desertion. Thus, the 70% hatching success figure given for Frederick Island (Vermeer and Lemon 1986) is probably low. Fledging success (chicks fledged/egg hatched) was 89–99% on Frederick Island (Vermeer and Lemon 1986; Vermeer et al. 1997; A. Harfenist, unpubl. data) and 47–93% on Triangle Island (Hedd et al. 2002). Annual variation in reproductive success is related to availability of prey which is, in turn, related to oceanographic conditions (Manuwal 1979; Ainley and Boekelheide 1990; Bertram et al. 2001). In British Columbia, reproductive success declined in a warm water El Niño year on Triangle Island, but a similar effect was not noted at more northerly Frederick Island (Bertram et al. 1999).

Site fidelity

Two types of site fidelity are considered for colonially nesting seabirds: fidelity to natal colony and fidelity to nest site. On the Farallon Islands in California, there is a strong tendency for Cassin's Auklets to return to breed on the islands where they hatched (Manuwal and Thoresen 1993). The birds are very faithful to nest sites on the Farallons as well. Fidelity to natal colony is unstudied in British Columbia. On Frederick Island, although most pairs returned to the same burrow to breed, on occasion pairs moved to a nearby burrow to nest and returned either to the new

burrow or to the original burrow in subsequent years (A. Harfenist, unpubl. data).

Home range

Does not apply.

Movements and dispersal

There is little movement between breeding and wintering grounds: following the breeding season, many Cassin's Auklets move offshore to occupy a wider extent of coastal waters for the winter (Gaston and Jones 1998). Although the winter range overlaps the summer range, there is some southward movement by at least part of the northern population: numbers wintering off the coast of California are far higher than the number that breed in California so some birds must be moving in from British Columbia and/or Alaska (Briggs et al. 1987; Manuwal and Thoresen 1993).

Habitat

Structural stage

2: herb (grass tussocks)

7: old forest

Important habitats and habitat features

Nesting

Cassin's Auklets require nesting colony islands without alien mammalian predators. Colony areas and adjacent shorelines must be free of most human disturbance; nearby marine areas must be free of light pollution and gill net fisheries.

Cassin's Auklets nest on either forested or non-forested offshore islands of varying sizes (e.g., Manuwal and Thoresen 1993; Gaston and Jones 1998). Nesting islands along Vancouver Island are covered with grasses (including *Calamagrostis*, *Elymus*), forbs (including *Heracleum*, *Maianthemum*) and shrubs (including salmonberry, *Rubus spectabilis*; wild rose, *Rosa* spp.) with little or no tree cover (Rodway and Lemon 1990, 1991b; Rodway et al. 1990b). Most of the colony islands along the northern mainland coast and in the Queen Charlotte Island/Haida Gwaii archipelago are covered with a forest of Sitka spruce, western hemlock,

and western redcedar (Rodway et al. 1988, 1990a, 1994; Rodway and Lemon 1991a).

Cassin's Auklets tend to burrow in deep soil on steep cliffs, seaward facing slopes or level areas (Manuwal and Thoresen 1993). On forested islands, they burrow under mature forest as well as in grass tussocks. A summary of habitat plots from Cassin's Auklet colonies throughout the Queen Charlotte Islands/Haida Gwaii indicates that 25% were in forested habitat with mossy or bare forest floor, 20% in forested habitat with grass tussocks, and 25% in non-forested areas with grass tussocks; the remainder were scattered among 10 different habitat types including driftwood piles, rock crevices, and middens (Vermeer et al. 1997). Burrow entrances are commonly under tree roots, stumps, fallen logs, or tussocks: on Frederick Island, 55% of burrows were under tree roots, stumps, or fallen logs; 33% in grass tussocks; 8% in bare ground or moss tussocks; and 4% in rock or cliff crevices (Vermeer and Lemon 1986). On Triangle Island, a non-forested site, preferred nesting areas are covered with short grass, ferns, or forbs; the birds also nest under low salmonberry bushes (Campbell et al. 1990).

The average burrow length was 1.0 m in the Queen Charlotte Islands/Haida Gwaii (Vermeer and Lemon 1986), but burrows may be >5 m in length with many branches and turns (A. Harfenist, pers. obs.). Burrow densities vary with habitat but averaged 1.36 burrows/m² on Triangle Island (Rodway et al. 1990b); in the Queen Charlotte Islands/Haida Gwaii, about half of the birds were nesting at densities higher than 0.7 burrows/m² (Vermeer et al. 1997).

Marine

Cassin's Auklets occur in marine habitats with mean sea surface temperatures between 9° and 20° C and 6° and 20° C in summer and winter, respectively (Gaston and Jones 1998). Most birds are found beyond the continental shelf, near the shelf break where it approaches the coast or over seamounts (Vermeer et al. 1985; Morgan et al. 1991; Morgan 1997). In British Columbia, Cassin's Auklets are not commonly observed inshore and rarely gather on the water near their colonies during the breeding season,

unlike some other species of auks (Campbell et al. 1990; Gaston and Jones 1998). In contrast, in the southern part of their range, some birds winter near breeding colonies (Manuwal and Thoresen 1993).

Conservation and Management

Status

The Cassin's Auklet is on the provincial *Blue List* in British Columbia. Its status in Canada has not been assessed (COSEWIC 2002).

Summary of ABI status in BC and adjacent jurisdictions (NatureServe Explorer 2002)

AK	BC	CA	OR	WA	Canada	Global
S4	S2S3B, S4N	S?	S2B	S4	N3B, NZN	G4

Trends

Population trends

An estimated 1 354 800 pairs of Cassin's Auklets nested at 61 colonies in British Columbia in 1991 (Rodway 1991), which represents ~80% of the world population. As population trend data have been determined for few sites throughout the species' range, quantitative global trend estimates are not available. However, it is likely that populations are significantly lower than historic levels (Springer et al. 1993; Gaston and Jones 1998). The main cause of population declines has been depredation by introduced rats, raccoons, mink, foxes, and cats to colony islands (Bailey and Kaiser 1993; Springer et al. 1993; Harfenist and Kaiser 1997). Colonies in the Aleutian Islands and Gulf of Alaska were eliminated by foxes; feral cats destroyed colonies off California and Mexico (Springer et al. 1993). A small colony in Washington declined in the 1980s as the Peregrine Falcon population increased (Paine et al. 1990).

Population trend information from British Columbia suggests that the total breeding population has declined here also. Declines or

eradication have been noted at six islands (Helgesen, Saunders, St. James, Langara, Cox, Lanz) with introduced rats, raccoons, or mink (Rodway et al. 1990b; Harfenist and Kaiser 1997). At Triangle Island, the world's largest colony, the population has declined at a rate of about 2%/yr since 1989 (D. Bertram, pers. comm.), possibly due to ocean warming (Bertram et al. 2000, 2001). A population decline on the Rankine Islands between 1984 and 2000 was probably due to a radical change in the vegetation cover following major windfall in the areas where the birds nested (M. Lemon, pers. comm.). In contrast, populations on Frederick Island, the second largest colony in British Columbia, as well as George and East Copper islands seem to be relatively stable (Lemon 1992, 1997, pers. comm.).

Habitat trends

The presence of introduced mammalian predators on present, former, and potential colony islands has rendered those islands unavailable for nesting Cassin's Auklets. With the exception of the presence of introduced mammals, potential suitable nesting habitat in British Columbia is likely relatively stable as colony islands are fairly isolated, and thus have not been subjected to urban development or industrial activities.

It is difficult to estimate trends in the availability of suitable marine habitat for Cassin's Auklets. The marine habitat adjacent to colonies can be rendered temporarily unsuitable by the presence of a commercial fishing fleet or a nearby sports fishing lodge. Ocean warming may have altered the location or decreased the number of suitable foraging sites for Cassin's Auklets in some regions (Ainley and Lewis 1974; Bertram et al. 2001).

Threats

Population threats

Introduced mammalian predators pose the most serious immediate threat to nesting Cassin's Auklets in British Columbia and elsewhere throughout its range (e.g., Manuwal and Thoresen 1993; Vermeer et al. 1997). In British Columbia, rats, raccoons, and mink have killed thousands of adults and chicks

(Bailey and Kaiser 1993; Harfenist and Kaiser 1997). At least half of the Cassin's Auklet colonies in the Queen Charlotte Islands/Haida Gwaii are vulnerable to invasion by raccoons; rats are less likely to swim between islands but may reach new colonies on commercial or pleasure boats or ship wrecks.

Other significant threats are contaminants, exploitation of ocean resources, human recreation, and climate change (e.g., Vermeer et al. 1997). Cassin's Auklets are extremely vulnerable to oil pollution: ~32% of the total carcasses found along Vancouver Island following the Nestucca oil spill were Cassin's Auklets (Burger 1992) and high mortality has been reported from oil spills off California as well (Manuwal and Thoresen 1993). Lethal and sublethal effects of oil on seabirds is well documented (e.g., Burger and Fry 1993). Impacts of chronic low-level pollution from ship operations such as bilge-flushing or leaking tanks may be more of a threat than large spills in British Columbia (Burger et al. 1997). Levels of organochlorine contaminants found in Cassin's Auklets in British Columbia are probably below those likely to cause serious effects on populations (Elliott et al. 1997).

The main issues of concern related to exploitation of ocean resources are bird/fisheries interactions and oil and gas development. The most serious threat from the commercial fishery is that of bycatch in fishing nets (DeGange et al. 1993). Birds attracted to lights on the boats also kill or injure themselves in collisions with wires and ropes. Commercial and recreational overfishing of Cassin's Auklet fish prey species such as rockfish may lead to a decrease in the availability of juvenile stages of these fishes for the birds (Vermeer et al. 1997). Oil and gas development in the oceans around the Queen Charlotte Islands/Haida Gwaii has the potential to increase mortality of Cassin's Auklets caused by oil or metal contamination, as well as that caused by collisions around lights (Montevecchi et al. 1999). Wind turbines, such as those recently proposed for a site off Rose Spit, may present a risk to migrating birds.

The activities of tourists involved in recreational boating or camping can damage the birds' habitat or

cause injury or mortality to adults and chicks. The main risk is from campfires built on the shorelines near colony sites. The birds are attracted to lights and will fly into the fires: this was the main hunting technique used by the Haida (Ellis 1991). Lights around recreational boats or campsites will also disorient the birds.

Climate change has been indirectly linked to changes in seabird populations via alterations of their prey species' ecology (e.g., Anderson and Piatt 1999). It has been suggested that the decline in the population of Cassin's Auklets breeding on Triangle Island may be related to changes in the timing and availability of prey species caused by warming oceanic temperatures (Bertram et al. 2000, 2001).

In the past, Cassin's Auklet adults and eggs formed a significant part of the diet of Haida (Ellis 1991) and probably that of other First Nations people, but at present there is little threat to the breeding populations from human harvesting.

Habitat threats

The main threats to habitat are from activities of visitors to colony areas. Walking on areas with fragile or shallow soil can cause burrows to collapse (Manuwal and Thoresen 1993). Nesting habitat on Triangle Island may be threatened by rabbits, an introduced species. The rabbits dig burrows and, thus may compete for or alter auklet burrowing habitat.

In addition, development or activities that significantly alter the shoreline such as log salvage operations, mariculture, or recreational sites are a threat to the suitability of nesting habitat because chicks and adults require a relatively unobstructed route between their burrows and the ocean.

Forest harvesting at breeding colonies can be a significant threat; however, currently all but one of the active Cassin's Auklet breeding colony sites in British Columbia are protected or proposed for protection (i.e., WHAs).

Marine habitats adjacent to colonies and important feeding areas are threatened by oil pollution, oil and

gas development, log sorts, and mariculture operations. The marine habitat can be rendered temporarily unusable by Cassin's Auklets by the presence of a commercial fishing fleet or a nearby sports fishing lodge.

Legal Protection and Habitat Conservation

The Cassin's Auklet and its nests and eggs are protected in Canada and the United States from hunting and collecting under the *Migratory Birds Convention Act*. In British Columbia, it is protected from killing, or wounding, taking, and transporting under the *Wildlife Act*. However, Cassin's Auklets were traditionally an important food source for members of the Haida Nation and Haida can still legally hunt the birds for subsistence purposes.

In British Columbia, 23 of 61 nesting colonies are within Gwaii Haanas National Park Reserve/Haida Heritage Site and 1 colony is within Pacific Rim National Park; those sites are protected under the *Canada National Parks Act*. Eighteen colonies are within ecological reserves and protected under the *Ecological Reserves Act*. Three additional colonies are within a British Columbia Provincial Wildlife Management Area and covered under the *Wildlife Act*. Fifteen of the remaining 16 colonies have been designated as wildlife habitat areas under *Forest Range and Practices Act*. One colony, on Egg Island, is on provincial Crown land. Two colony islands (Lanz and Cox islands) from which Cassin's Auklets were eradicated by raccoons or mink are on provincial Crown land.

Marine protected areas for the conservation of Cassin's Auklets can be created under the *Canada Wildlife Act*, although none have been designated to date. The *Canada National Marine Conservation Areas Act*, which came into force in June 2002, provides authority for the establishment of marine conservation areas. Marine bird bycatch in fisheries is covered under the *Fisheries Act*.

Identified Wildlife Provisions

Sustainable resource management and planning recommendations

The establishment of WHAs may not be adequate for addressing the threats faced by Cassin's Auklets. The link between terrestrial nesting habitats and adjacent and nearby terrestrial and marine habitats should be considered.

- ❖ Provide unobstructed access to the open ocean for adults and chicks departing the colony: no development such as log sorts, fishing lodges, mariculture operations, or recreation sites on shore, intertidal areas, or nearshore areas, or along opposite shores of the mainland or non-colony islands.
- ❖ Provide undisturbed access to marine foraging grounds for provisioning adults during the breeding season.
- ❖ Discourage commercial and sports fishing activities in adjacent marine waters during the breeding season.
- ❖ Provide uncontaminated marine waters around colonies: to prevent exposure to chronic oil pollution from commercial or recreational boats, no mooring buoys in inshore areas around colonies. Restrict oil and gas development near colonies and foraging areas.
- ❖ Provide colony and near-colony habitats free of pollution from artificial lights.
- ❖ Maintain integrity of marine habitats of prey species.
- ❖ Restrict recreational use and access to colony sites (see "Additional Management Considerations").

Wildlife habitat area

Goal

Protect and maintain integrity of breeding colonies.

Feature

Establish WHAs at breeding colonies not already within national parks, national park reserves, ecological reserves, and wildlife management areas or other protected areas. Where Cassin's Auklet nesting colonies have been negatively impacted by introduced predators, WHAs should be established

on former colony sites once the threat has been removed to allow the re-establishment of the colony and the recovery of the population.

Size

Generally between 5 and 50 ha but will vary with size and shape of nesting area.

Design

Cassin's Auklets nest around the periphery of islands and adults and chicks need unhindered access to the ocean. WHAs should include all areas with active nesting and the adjacent shoreline areas plus 200 m to maintain the quality and isolated nature of the forest and forest floor. In some cases, it may be necessary to include more area (possibly entire island) to ensure the integrity of a WHA is maintained (i.e., when active nesting occurs around the entire or significant proportion of an island and the only access for development would impact the colony such as impacting the integrity of the forest or forest floor).

General wildlife measures

Goals

1. Protect breeding colonies from development and disturbance.
2. Prevent mortality and disturbance of breeding birds and young on and adjacent to nesting areas.
3. Maintain important habitat features (i.e., intact forest structure and forest floor).
4. Prevent the introduction of non-native species.

Measures

Access

- Do not develop roads or access structures and restrict access to qualified biologists for purposes of monitoring populations.

Harvesting and silviculture

- Do not harvest or salvage timber.
- Do not allow development of any form in WHA or adjacent inshore waters.

Pesticides

- Do not use pesticides.

Recreation

- Do not develop recreation sites, trails, or structures.

Additional Management Considerations

Under the results based code (RBC), colonies can be protected from forest practices (including restrictions on establishing MOF recreational facilities); however, it is not the mandate of the RBC to regulate recreational activities. Recreational activity at these colonies is considered a serious threat to this species. The following recommendations should be considered at colony sites.

Restrict access and do not allow recreational activities on colony islands.

Do not allow sports fishing lodges adjacent to colonies or on nearby shorelines.

Avoid activities involving lights or fires on nearby shorelines or in inshore waters around colonies.

Educate public on how to avoid disturbing nesting colonies. Clearly mark on marine and recreation maps with a notation that human access is prohibited at WHAs and other sites protected for these species.

Remove introduced species from colony islands. Ensure that non-endemic plants and animals are not introduced to colony islands. If necessary, reintroduce Cassin's Auklets to islands where colonies have been extirpated once introduced predators have been eradicated.

Information Needs

1. Improve methods to estimate population size. Monitor populations.
2. Marine habitat information and identification of important feeding areas.
3. Test methods of attracting species back to areas from which they have been eradicated.

Cross References

Ancient Murrelet, Keen's Long-eared Myotis, "Queen Charlotte" Hairy Woodpecker, "Queen Charlotte" Northern Saw-whet Owl

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