

BC's Coast Region: Species & Ecosystems of Conservation Concern Pacific Water Shrew (*Sorex bendirii*)

Global: G4 Provincial: S1S2 COSEWIC: E, BC List: Red Identified Wildlife



Notes on *Sorex bendirii*: Of the 12 species of the family Soricidae (“shrews”), in BC, *S. bendirii* is one of three aquatic specialist species known as “water shrews”. Also referred to as “Marsh Shrew” and “Bendire’s Shrew”, this species is at the northern edge of its range in BC and found nowhere else in Canada. This is the only federally listed endangered shrew species.



Description

Length 13.7-17.9 cm (including 7cm tail), Weight 10-20 g. In North America this is the largest shrew in the genus *Sorex*. Fur (pelage) is a velvety dark-brown to black, only slightly paler on the ventral area than on the dorsal area; more brownish in summer than winter. The dark brown tail is uni-coloured. The pelage has a dual ability to repel water while trapping a layer of air. This acts as an insulation layer reducing heat loss by 50% while swimming (critical as most shrew species have a high metabolic rate and can stress from energy loss quickly). The skull is large with a ventrally curved rostrum (dorsal area where the snout extends from the skull) and holds 32 teeth¹. As their name implies, Pacific Water Shrew are excellent swimmers. Air bubbles trapped beneath the unique fringe hairs of the feet provide enough buoyancy to enable them to run on the surface of the water for up to 5 seconds.

Diet

An insectivore, Pacific Water Shrew has similar prey preferences to other shrews. As well as terrestrial invertebrates, their semi-aquatic lifestyle provides access to a range of benthic invertebrates, worms and mollusks. Prey is located under water and on land by sound and sensitive whiskers (“vibrissae”)² located on the flexible snout. Prey is always consumed on land even if caught underwater.

Looks Like?

Their relative large size and fringe hairs on the feet distinguish Pacific Water Shrew from all other shrew species except for American Water Shrew (*S. palustris* a.k.a. *Common Water Shrew*). American Water Shrew can be identified by grey to black dorsal fur with a silver-grey belly, a bi-coloured tail with a paler ventral surface, and a smaller skull with the rostrum not curved ventrally.



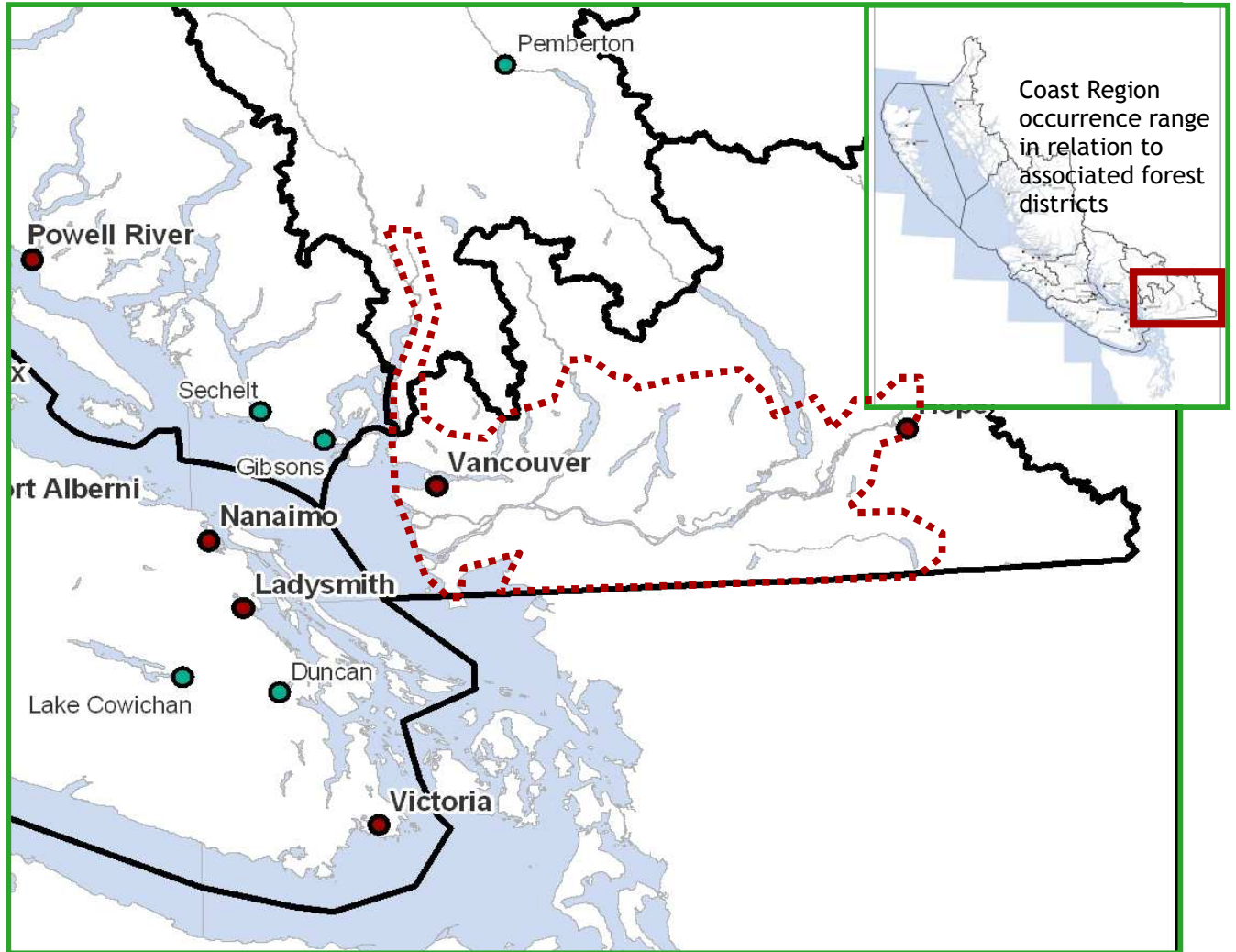
American Water Shrew

¹ In shrews dentition patterns, shape and number are a key identification tool

² Recent research has identified that water shrews use their vibrissae to detect sound and motion waves under water, allowing them to home in on fish and other prey items.

Distribution

Elevation <1000 m (typically <850 m). Found from northern California to Oregon, Washington State and the extreme southwest of BC. In BC, Pacific Water Shrew known to occur in the Fraser Valley out to Hope (perhaps further) and low-mid elevation areas and the Howe Sound-Squamish area to the northwest (perhaps as far north as Whistler).



Pacific Water Shrew (*Sorex bendirii*), potential occurrence range for the Coast Region

Habitat Preferences

Pacific Water Shrew is found in and around riparian areas, especially small systems (e.g. <10 m wide) as well as a variety of wetland classes. As aquatic specialists, water shrews have a high fidelity for areas within 50 m of the water's edge. Upland forests may be required for overwintering/nesting and/or dispersal. This species has also been found in lowland channelized drainages (e.g. highway median stream crossings and ditches).

Key habitat components for water shrew species (instream and in adjacent riparian areas) include high levels of structural diversity, low levels of disturbance and abundant invertebrate food sources



Critical Features

This species has a marked preference for mature coniferous forests typically found in association with moist, coastal western hemlock communities. Dense understory vegetation with abundant downed wood are important habitat components (and may be more important than forest age). Nests/den sites found in downed wood were made up of shredded bark, soft grasses, mosses and available vegetation.

Seasonal Life Cycle

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Courtship / *Breeding (most pups born in March-May). Nest should be protected from January to late August. Litter size 3-4 to 5-7. *											
Active for entire lifespan (1.5 years)											

Males do not breed their first summer.

Threats

- ◆ Distribution coincides with areas undergoing rapid development and habitat loss/alteration. Damage and destruction of nests/den sites, litter abandonment and possibly extirpation of local populations are likely to occur where logging, removal of standing, dead and downed wood and other land use activities results in the temporary or permanent disturbance to riparian communities.
- ◆ Roadways that cut through core habitat areas and lack wildlife passage structures increase vehicle mortality impacts and population fragmentation.
- ◆ Reproductive success and population sustainability are limited by short lifespan reducing the potential for 'backup' populations in the event of local population declines.
- ◆ Contaminated runoff from roads and other impervious surfaces effects water quality and clarity and this species aquatic prey base and may adversely effect the insulating capability of the shrew's pelage.
- ◆ Direct mortality from by-catch in minnow traps or small mammal traps from inventory activities as well as potential mortality from rodent pest control activities in developments in and adjacent to riparian areas.
- ◆ Predation from free ranging and feral domestic pets (i.e. cats).

Conservation & Management Objectives

- ◆ Apply best practices, inventory and assessment standards as well as protective measures as set out in the "Recovery Strategy for the Pacific Water Shrew *Sorex bendirii* in British Columbia" and "Best Management Practices Guidelines for Pacific Water Shrew in Urban and Rural Areas (BMP; working draft). The Identified Wildlife Provisions for this species found in "Accounts and Measures for Managing Identified Wildlife - Accounts V. 2004 Pacific Water Shrew *Sorex bendirii*" is available to foresters but should include updated management advice recommended in the BMP.

Specific activities should include:

- ◆ Identify and set aside core and management (buffer) zones to protect habitat, such as riparian (streamside) forests, downed wood and wetland margins. Shrews tend to have very linear territories that follow the length or perimeter area around streams and wetlands. Core riparian zones should extend a minimum of 100 meters perpendicularly from the top of banks, where habitat is still available, to retain habitat conditions, reduce human disturbance and edge effect.
- ◆ Habitat connectivity should be maintained or restored. Where habitat exists or can be restored, the riparian zone should encompass intact riparian vegetation at least 1.5 km in length in order to maintain connectivity and ensure the long-term viability of resident populations.
- ◆ Assess, inventory, mitigate and monitor using methodology set out in Pacific Water Shrew Best Management Practices (BMP).
- ◆ For site series ranked as high or moderate capability for Pacific Water Shrew - assume the species to be present in that area and implement protective measures. If the project area contains low capability habitat, or is within 100 meters of moderate or high capability habitat, it should be surveyed for the presence of water shrews along at least one-third of the length of the entire waterbody, (e.g. along a 1.5 km watercourse 500 meters should be inventoried).
- ◆ Design and locate your development to avoid impacts to habitat and residence. Nests/den sites are often in downed wood, under bark, or in old woodpecker cavities. Damage and destruction of nests/den sites, litter abandonment and

possibly loss of local populations are likely to occur if critical features are removed or disturbed in core zones and management areas. Any activity that reduces the function of the nest would constitute damage or destruction of the residence. Activities such as logging in riparian areas, removal of standing, dead and downed wood, removal of riparian vegetation, and encroachment of urban development could all potentially damage or destroy Pacific Water Shrew nests.

- ◆ Utilize fencing or other barriers effective in controlling access by domestic pets and human disturbance into riparian areas.
- ◆ Stormwater should be appropriately managed using Integrated Stormwater Management (ISM) principles to prevent runoff and non-point source impacts to receiving waters.
- ◆ Habitat connectivity should be maintained through the use of habitat corridors and wildlife underpasses as described in the BMP.
- ◆ Implement agricultural land set-asides and stewardship agreements and work towards covenant and acquisition opportunities in valley bottom connectivity corridors and riparian areas.
- ◆ Utilize integrated pest management programs to reduce and avoid the need for rodent pest control methods that may impact native wildlife.

This species is listed under the Federal Species At Risk Act (SARA), is Identified Wildlife under the BC Forest and Range Practices Act and subject to protections and prohibitions under the BC Wildlife Act. Habitat for this species may also be governed under provincial and federal regulations including the Fish Protection Act and Federal Fisheries Act as well as Regional and local municipal bylaws. Contact the Provincial regional species at risk biologist and/or the recovery team for the most up to date information.

Content for this Factsheet has been derived from the following sources

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Every effort has been made to ensure content accuracy. When managing for this species and for the most current information please also contact the Heron working Group or the regional species at risk biologist - 604 582 5200. Comments or corrections should be directed to the South Coast Conservation Program: info@sccp.ca. Content updated May 2012.

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