# BC's Coast Region: Species & Ecosystems of Conservation Concern
# American Water Shrew, *brooksi* subspecies (*Sorex palustris brooksi*)
**Global: G5, Provincial: S1S2, COSEWIC: E, BC List: Red / Identified Wildlife**

Notes on *Sorex palustris brooksi:* Of the 12 species of the family Soricidae (shrews) in BC, *S. palustris brooksi* is presently the only documented subspecies. Genetic analysis indicates divergence from the mainland form of *S. palustris* is relatively recent (~12,000 years ago during the last glaciation period). Also referred to as "Vancouver Island Water Shrew", "Common Water Shrew" or "Navigator Shrew." Much about the subspecies biology is inferred from the mainland form.


**Description** *Length 15.2 cm (including 7.5 cm tail) Weight 10.6 g.* American Water Shrew are relatively large, surpassed in size only by Pacific Water Shrew (17.9 cm), found on the mainland. As with other water shrews this subspecies possesses specialized traits for living in and around water. The pelage (fur) has a dual ability to repel water while trapping a layer of air giving the shrew a silvery appearance underwater. The air 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). Coarse fringe hairs (1.5 mm) on the hind feet trap air bubbles and provide buoyancy, dives can last up to 47 seconds. When dry the pelage is a glossy slate grey to black dorsally with the ventral area silver-grey or light brown. The tail is similarly bi-coloured. The skull has a short straight snout with 32 teeth[1] including five upper unicuspids (teeth in the upper jaw and lower jaw having a single cusp which follow the incisor), with the third distinctively smaller than the fourth. The first upper incisor has an indistinct, medial tine (small, pointed accessory cusps).

**Diet** Shrews are Insectivores. Water shrews with their aquatic lifestyle have access to a range of aquatic insects, worms and mollusks as well as terrestrial species found in adjacent riparian environments. Water shrews will also catch and consume vertebrates (amphibian larvae, small fish and their eggs). Prey is located via sensitive vibrissae (whiskers[2]) found on the flexible snout.

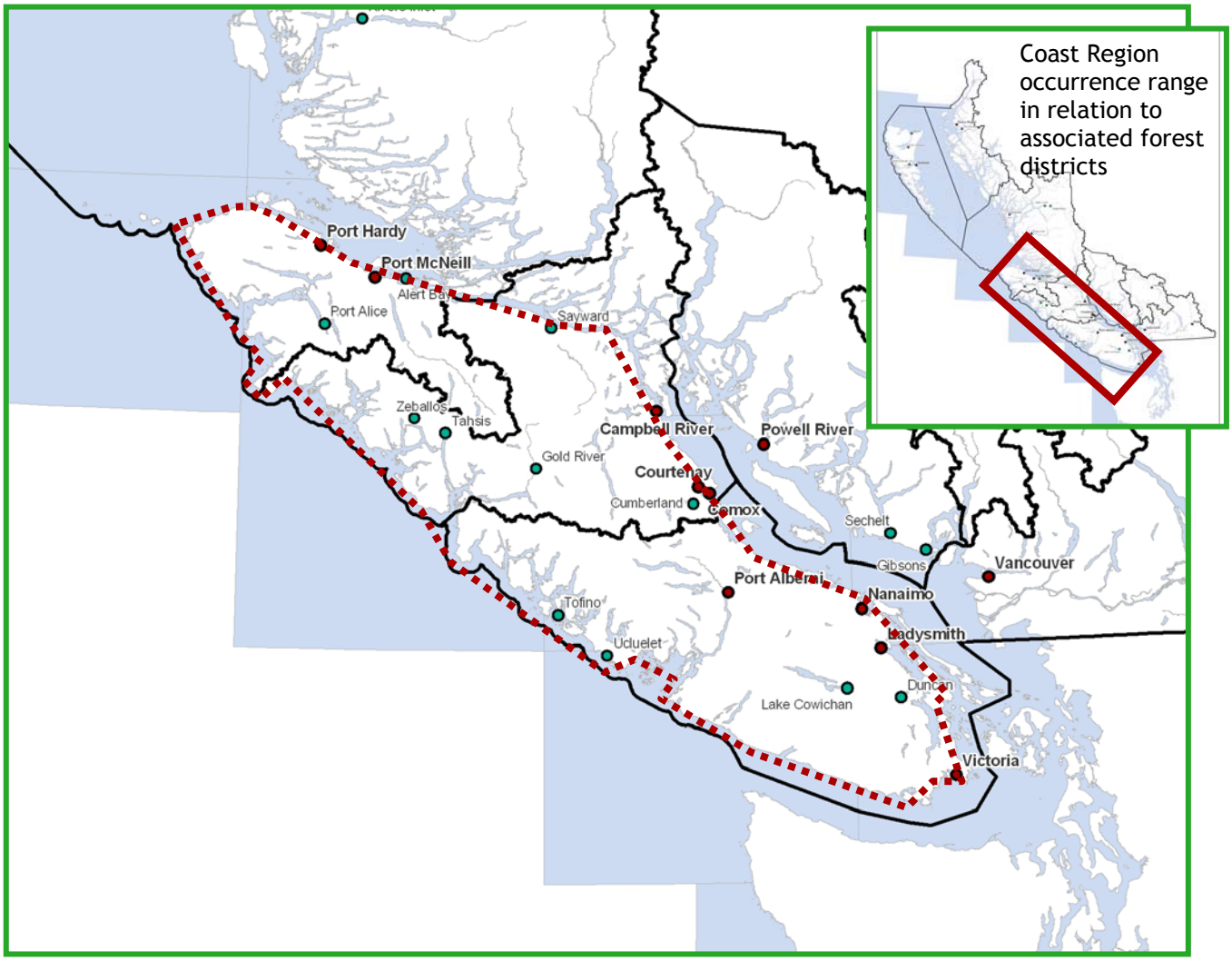
**Look's Like?** Due to its size and habits, this subspecies has periodically been mistaken for Pacific Water Shrew; however, their ranges do not overlap. Two other shrew species that occur on Vancouver Island - Dusky and Vagrant Shrew may also be found in riparian areas. Vagrant Shrew has similar bi-colouration but is a soft brown colour, much smaller (12 cm including the tail) and lacks the distinct fringe hairs on the hind feet.

Vagrant Shrew

[1] In shrews dentition patterns, shape and number are a key identification tool
[2] Recent research has indentified 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 30-560 m (possibly up to 2900 m).* American Water Shrew is found throughout much of Canada, southwestern Alaska, and cooler mountainous areas of the United States. The *brooksi* subspecies is restricted to Vancouver Island and is known from approximately 38 locations from the far south in Victoria (Veitch Creek) to the north in Port Hardy (Quatse River) and as far inland as Robertson Creek and the Lowry Lake area (near Port Alberni) and along the west coast at Lost Shoe Creek near Ucluelet.




American Water Shrew, *brooksi* subspecies (*Sorex palustris brooksi*), known occurrence range for the Coast Region

## Habitat Preferences

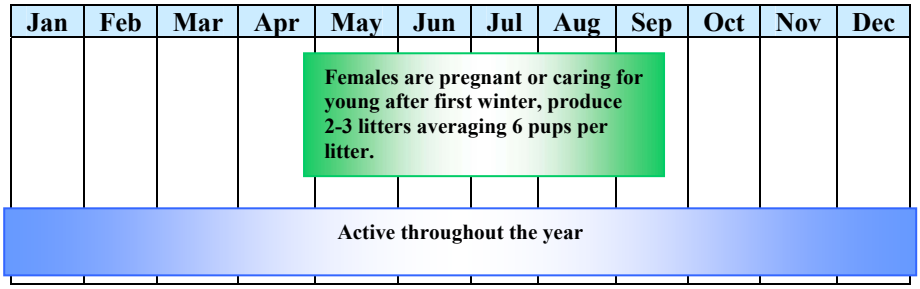
Little is known about this subspecies. Much about its biology is inferred from its mainland form and Pacific Water Shrew. Proximity to aquatic habitats with little or no disturbance and intact diverse riparian communities appears more important than maturity of the overstory.

## Critical Features

As aquatic specialists, water shrews have a high fidelity for areas within 50 m from the waters edge. Dense, continuous riparian corridors with a diversity of shrub species and downed wood are important habitat components. Nests/den sites can be found in downed wood made up of shredded bark and soft grasses.

Key habitat components for water shrew both instream and in adjacent riparian areas include high levels of structural diversity, low levels of disturbance and abundant prey items (e.g. aquatic invertebrates).

## Seasonal Life Cycle




Juveniles mature in their first winter, lifespan is up to 18 months, survival through to second winter unlikely.

## Threats

- Urban/rural development, forestry activities and road development contribute to habitat and subsequent population fragmentation, especially in low elevation connectivity corridors. Damage and destruction of nests/den sites, litter abandonment and possibly extirpation of local populations is likely to occur where removal of standing dead and downed wood and other disturbance results in temporary or permanent alteration to riparian integrity.
- Predation from free ranging and feral domestic pets (i.e. cats).
- Though many litters can be produced per breeding season, 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 as well as prey items (e.g. aquatic invertebrates) 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.

## Conservation & Management Objectives

- Best practices, inventory and assessment standards as set out in the "Recovery Strategy for the Pacific Water Shrew *Sorex bendirii* in British Columbia" as well as "Best Management Practices Guidelines For Pacific Water Shrew In Urban and Rural Areas" should be applied as surrogate conservation and management objectives until specific approaches can be developed for the *brooksi* subspecies. Integrate complimentary conservation objectives and guidelines as set out in the Identified Wildlife Provisions found in "Accounts and Measures for Managing Identified Wildlife – Accounts V. 2004 "Vancouver Island" Common Water Shrew *Sorex palustris brooksi*" as well as recommendations developed in "Habitat Associations of Vancouver Island Water Shrews in Restored and Natural Stream Habitats." While identification may be

difficult, retaining numerous vouchers for analysis could impact local populations. Genetic analysis using hair and/or feces is recommended to reduce need for retaining actual specimens.

**Specific activities should include:**

- Adequately protect areas around current or historical occurrences where habitat still exists or can be restored such as structurally intact habitat features and connectivity corridors. These include coarse woody debris/downed wood and well developed native plant understory communities essential for micro-climate needs and foraging cover.
- Reconnect fragmented segments of riparian areas based on water shrew life history requirements. Buffers used for Pacific Water Shrew (100m on either side from top of the bank of a waterbody) are likely necessary to protect the full range of habitat requirements for this subspecies.
- 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.
- Wildlife underpasses should be installed at appropriate intervals where high road densities and potential for vehicle interactions occur. Clear-span crossings are preferred. Culvert crossings should be a minimum 2 m diameter with open bottoms with natural substrate, no longer than 30 m and should not have large drops that would impede small mammal (or fish) movement. On long culverts that are dark in the middle, consider the use of grates that will allow light and rain to enter.
- 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 subspecies of American Water Shrew 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.

## Content for this Factsheet has been derived from the following sources


B.C. Conservation Data Centre. 2010. [Internet] [Updated November 30 2009) Conservation Status Report: *Sorex palustris brooksi*.
Beneski, John T. and Derek W. Stinson. 1987. [Internet]. *Sorex palustris*. Mammalian Species No. 296, pp 1-6. American Society of Mammologists.
Catania Kenneth C. et al. 2008. [Internet]. Water shrews detect movement, shape, and smell to find prey underwater. Proceedings of The National Academy of Sciences of the USA. PNAS vol. 105 no. 2 pp. 571–576
Environmental Law Institute. 2003. [Internet]. Conservation Thresholds for Land Use Planners. ISBN# 1-58576-085-7, ELI project code 003101
Craig, Vanessa and Ross Vennesland. 2007. Best Management Practices Guidelines for the Pacific Water Shrew in Urban and Rural Areas (in draft). Prepared for the BC Ministry of Environment. Victoria (BC).
Craig, Vanessa and Steven F. Wilson. 2004. [Internet]. Habitat Associations of Vancouver Island Water Shrews in Restored and Natural Stream Habitats. Proceedings of the Species at Risk 2004 Pathways to Recovery Conference. Victoria (BC).
Darling, L. 2004. [Internet]. Accounts and Measures for Managing Identified Wildlife – Accounts V. 2004 "Vancouver Island" Common Water Shrew *Sorex palustris brooksi*
Pacific Water Shrew Recovery Team. 2009. Recovery Strategy for the Pacific Water Shrew (Sorex bendirii) in British Columbia. Prepared for the B.C. Ministry of Environment, Victoria, BC. 27 pp.
Polster, D. et al. 2006. Develop with Care: Environmental Guidelines for Urban and Rural Land Development in British Columbia. Prepared for the BC Ministry of Environment. Victoria (BC).
Proulx, Gilbert et al. 2003. A Field Guide to Species at Risk in the Coast Forest Region of British Columbia. Published by International Forest Products and BC Ministry of Environment. Victoria (BC).
Welstead, Kym, and Ross Vennesland. 2006. [Internet] Fish Traps Threaten Pacific Water Shrew Recovery. Streamline Watershed Management Bulletin Vol. 9/No. 2 Spring 2006.



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Every effort has been made to ensure content accuracy. Comments or corrections should be directed to the South Coast Conservation Program: info@sccp.ca. Content updated August 2010.

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