BC's Coast Region: Species & Ecosystems of Conservation Concern

Oregon Forestsnail (*Allogona townsendiana*) Global: G3G4, Provincial: S1S2, COSEWIC: E BC List: Red

Pacific Sideband (*Monadenia fidelis*) Global: G4G5, Provincial: S3S4 ,COSEWIC: N/A BC List: Blue

Oregon Forestsnail

Pacific Sideband

Notes on *Allogona townsendiana* & *Monadenia fidelis*: Members of the family Polygyridae ("land snails") these two species are representative of the largest native terrestrial snails in BC. As with most snails, both species are hermaphroditic (possessing both male and female sexual organs). Both have unique reproductive characteristics. *Allogona* male reproductive anatomy is unusual, from which the genus name meaning "different genitalia" is derived. Mating clusters of several forestsnail individuals is not uncommon. Species of the genus *Monadenia* create "love darts", tiny hardened projectiles covered in a hormonal mucus used during courtship. The dart is inserted upon contact prior to mating. Individuals that insert their dart first tend to have a more favourable reproductive outcome as the hormonal substance in the mucus enhances sperm survival.

Description As "pulmonate" snails these species have evolved their mantle cavity into a lung (instead of gills as still found in some snails). Breathing is through a single opening on the right side of the body which either remains open or opens and closes.

Oregon Forestsnail: *shell diameter 2.8-3.5 cm, shell diameter is 1.4 to 1.7 times shell height*. One of the largest land snails in BC, the shell has 5 to 6 whorls (spirals) with lighter colored axial ribs (thin bands that cross each whorl). The uppermost whorls are often pale from wear. Shell colour ranges from gold to dark brown, lightening to amber around the aperture (shell opening). As the snail matures the shell can become bleached looking and begin to flake. This species lacks the 'hairs' found on the shell of other land snail species. The thick white aperture lip of adult snails is evident when viewing the snail from below; juveniles lack this thickened aperture lip.

Oregon forestsnail (dark morph) showing shell aperture & lip

Pacific Sideband: *shell diameter 3.5 cm+, shell diameter is 1.3 to 1.5 times shell height*. The largest land snail in BC, the shell has 6.5 to 7 whorls with a thin black line along the bottom of each whorl. Shell colour ranges from chestnut to dark rose with vertical bands (sometimes lacking). Light, mustard – coloured individuals are common at some localities; these light individuals lack the characteristic banding. Some island populations may have pale white shells with dark whorl lines. The body of this snail is rosy-pink or pinkish-brown and the surface of the flesh looks deeply wrinkled or "pebbly" in texture. The aperture lip of the adult shell is thin, not thickened or flared as with Oregon forestsnail (right).

Diet Oregon forestsnail has a strong preference for understory herbaceous vegetation, especially stinging nettle and sword fern communities found in association with bigleaf maple, salmonberry and red alder. Pacific sideband feeds on a range of vascular plants (e.g. sword fern) and non-vascular plants (lichens, fungi) foraging in the understory as well as amongst tree trunks and upper branches. An energetic climber, Pacific sideband have been found foraging up to 6.7 meters above the forest floor and hanging from the tips of branches.

Look's Like?

The large size, thick white shell aperture, and coarse texture of the shell distinguish Oregon forestsnail from most other land snails on the Coast Region. Puget Oregonian is almost the same size and also possesses a defined white aperture; but unlike Oregon forestsnail, adults have a tooth-like projection in the shell aperture. Puget Oregonian is believed to be extirpated from its historic range in BC. Pacific sideband, though larger and more colourful, is frequently mistaken for *A. townsendiana* by inexperienced observers. Northwest Hesperian, another native land snail is smaller (shell diameter <1.6 cm) and the shell is usually covered with short hairs, noticeable when the shell is held up to light. Amber morphs of the introduced grovesnail may also be mistaken for Oregon forestsnail, especially in suburban areas.

Puget Oregonian, believed extirpated from BC, is similar in size, morphology and habitat characteristics to Oregon forestsnail. The tooth in the aperture of Puget Oregonian (right) is lacking in Oregon forestsnail and is a diagnostic feature between the two species.

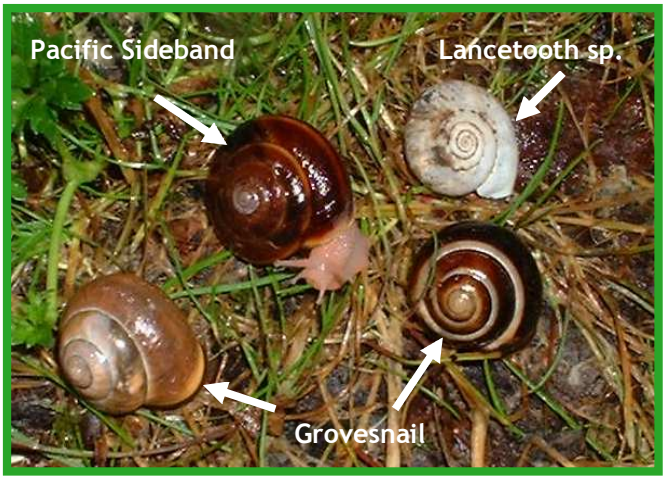
Pacific Sideband's large size distinguish it from other land snails, however the variation in whorl patterns, shell colour, occurrence of a solid yellow-coloured shell morph, and individuals with worn, bleached and flaking shells makes mistaken identity possible with Oregon forestsnail. The striping on the smaller, introduced grovesnail (a European species), may create some confusion when they are found with juvenile Pacific sideband, however the line pattern on grovesnail is usually thick or more heavily striped.

Bleached and worn (top right), this Pacific sideband could easily be mistaken for a dark morph Oregon forestsnail with a worn shell. The colour of Pacific sideband's flesh which varies from pink to burgundy-brown and has a raised pebbly texture can be a helpful diagnostic in some circumstances.

Young Pacific sideband (right - with pink body), can be confused with grovesnail, an introduced snail species from Europe. Grovesnail range from a solid amber colour (bottom left) to shells with varying widths of dark striping on a light background (bottom right).

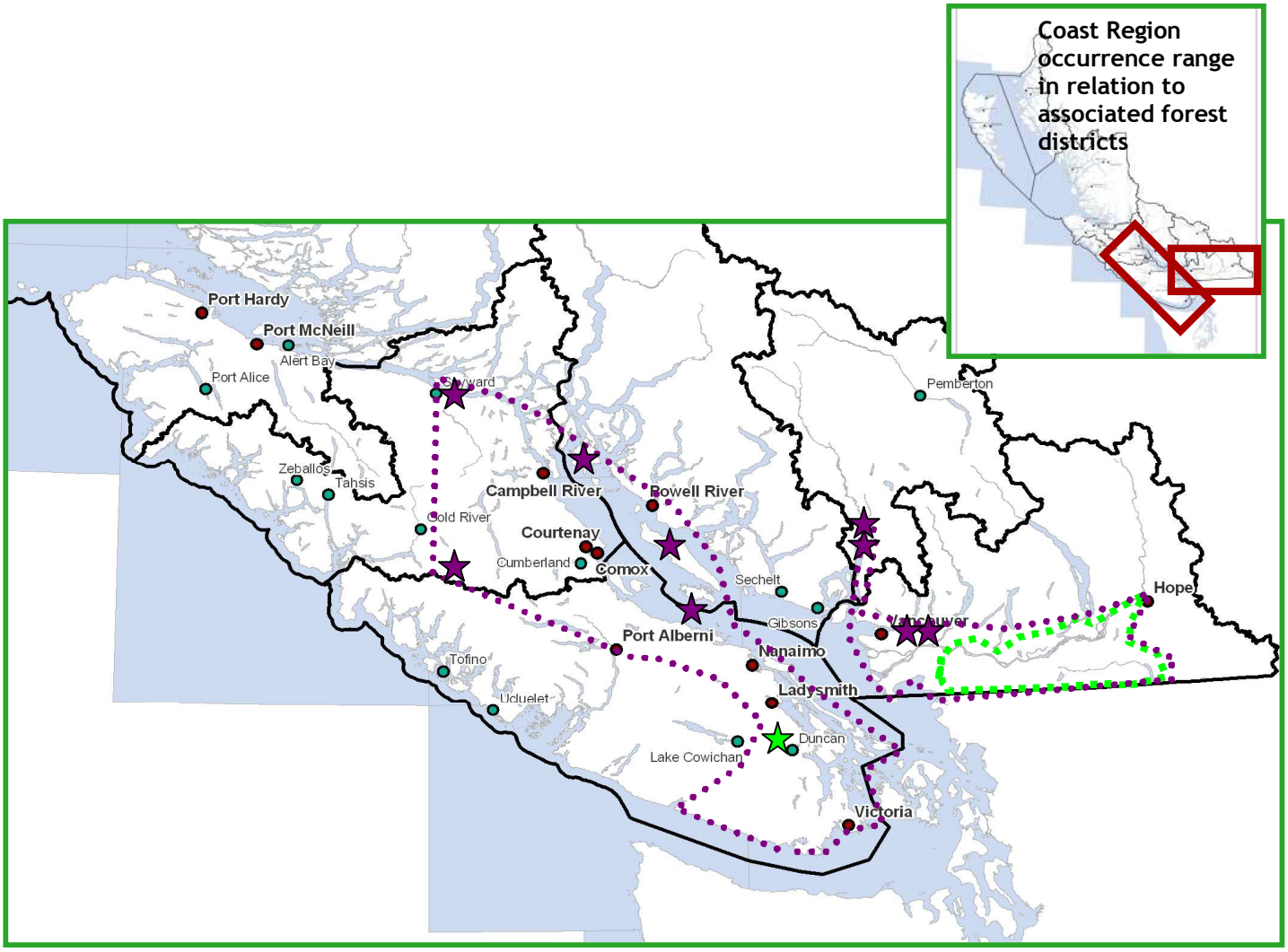
A diagnostic difference between grovesnail and Pacific sideband is the depth of the hole of the central whorl on the underside of the shell. On Pacific sideband the hole appears to go all the way through the shell. On grovesnail it is shallow.

Numerous species of lancetooth snail (right - white bleached shell), a common native carnivorous snail, may also sometimes be mistaken for Oregon forestsnail.



Distribution

Oregon Forestsnail: *Elevation: <350 m* In B.C. Oregon forestsnail is restricted to the Fraser Lowlands and southeast Vancouver Island of the Coast Region. Occurrences range from both sides of the Fraser River, including: Langley, Chilliwack (Ryder Creek watershed, Little Mountain, Cheam Lake), Mission (Hatzic Prairie) and Abbotsford (McKee Peak and lower Sumas Mountain as well as the City proper) and the lower Coquitlam River. It has also been found near White Rock in the west and near Hope in the east. The species is known from one location on southeast Vancouver Island (near Crofton), from where there are both historical (1903) and recent (2003) records.
Pacific Sideband: E*levation, possibly up to 1220 m*. Pacific sideband overlaps with the range of Oregon forestsnail in the Fraser Lowlands (e.g. north and south of the Fraser River) but has a more extensive range overall including islands in the Salish Sea (e.g. Texada Island), the Sunshine Coast, Howe Sound/Squamish/Cheakamus River valleys as well as numerous locations on the south, mid and northern portions of Vancouver Island. The actual northern and elevational limits of its distribution in BC are presently unknown.



Oregon Forestsnail (*Allogona townsendiana: green-dotted line and green star*), known occurrence range & Pacific Sideband (*Monadenia fidelis: purple-dotted line and purple stars*), known occurrences and present known range[1] for the Coast Region.

[1] Actual northern and elevational limits of Pacific sideband distribution in BC is presently unknown, the species is likely much more widely distributed based on historical and ongoing discovery of new occurrences.

Habitat Preferences

On the South Coast portion of the Coast Region, both species are found in broadleaf forests or mixed forests. Oregon forestsnail has strong associations with stands that support bigleaf maple, western redcedar, red alder, salmonberry, stinging nettle (whether native or introduced stinging nettle is preferred is unknown), and sword fern. Pacific Sideband has a broader occurrence range and is associated with marine variant and upland forest habitats including Garry oak, Coastal Douglas-fir and other coniferous dominated forests with a range of understory shrubs and herbaceous species. On Texada Island Pacific sideband were found in association with a southwest aspect marine bluff at the edge of a Douglas-fir forest community. Both species are commonly found on steep terrain. Oregon forestsnail tend to utilize edge or transitional areas ("ecotones") while Pacific sideband are found more within interior areas of forested stands. However both species can overlap in habitat preferences depending on time of year and moisture conditions. Both species can be found in landscaped areas and gardens, on trails and on road edges (within close proximity to vegetative cover).

Critical Features

Patterns of distribution and abundance are poorly known for both species. Even less is known about preferences for egg deposition sites or juvenile dispersal habitats which may vary across their range. Land snails are relatively sedentary and thought to have poor dispersal capabilities. Both species can tolerate some level of disturbance. However these species lack necessary mobility to easily seek new undisturbed habitats. Oregon forestsnail has been shown to utilize variable patch sizes from as little as $4m^2$ to as large as $70m^2$. Home range size however does not necessarily equate to the size and complexity of habitats needed to support a given population or populations of snail. A thick leaf litter layer (5-10cm) or moss layer is important for providing essential, moist microclimates that protect snails during cold temperatures and drought, as well as supporting the growth of fungal mycelium (which Pacific sideband forage on). Ground cover such as woody debris and rock piles provide additional foraging sites, areas for courtship and mating, summer refugia and winter hibernacula.

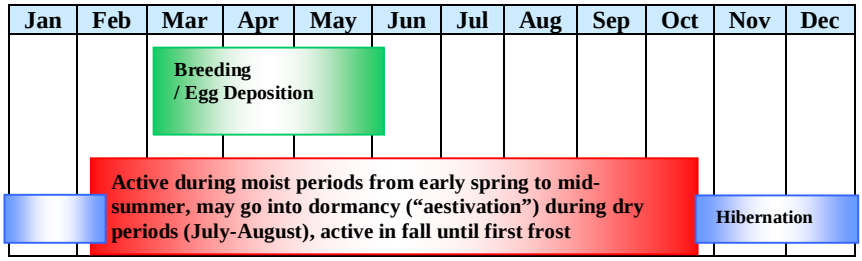
While Oregon forestsnail and Pacific sideband distributions overlap in areas of the Coast Region, these species have somewhat different preferences for food plants as well as habitat features. However both species generally require intact, well connected forested landscapes with high structural diversity and understory complexity. Habitat must provide a stable, moist microclimate and aestivation and hibernation sites that are essential to support various components of their lifecycle.

Oregon forestsnail habitat, Fraser Lowlands - Bigleaf maple, black cottonwood, western redcedar, stinging nettle community.

Oregon forestsnail & Pacific sideband, overlapping habitat, Fraser Lowlands - Mixed coastal western hemlock forest with sword fern and red alder.

Pacific sideband habitat, Straight of Georgia Islands / East Coast Vancouver Island- Coastal Douglas-fir moist maritime forest.

Seasonal Life Cycle



Mating for Oregon forestsnail takes place during periods of high humidity (80-100%). Pacific sideband may have similar requirements. Adults generally dig and deposit eggs in shallow nest holes in soft soil and leaf litter; nest holes may be shared (i.e. for Oregon forestsnail). Oregon forestsnail takes ~2-3 years to reach maturity and may live up to 5 years. Pacific sideband takes ~2 years and may live up to 6 years.

Threats

- Distribution for both these species coincides with areas undergoing significant urbanization, logging, clearing and habitat fragmentation.
- Recreational activities (e.g. ATV use, mountain biking, hiking), can result in impacts to forage plant communities, essential habitat features as well as direct mortality.
- In general, land snails have a low tolerance to drying and exposure, are not extensively mobile, and are slow to disperse. This leaves them extremely vulnerable to activities that impact microclimate conditions, decrease food supplies available or create barriers to dispersal (e.g. land clearing, extensive paved areas).
- The degree of competition from introduced species such as grovesnail and brown garden snail is unknown and may be impacting native mollusk species.
- The level of impact from misidentification of native snail species as introduced pests, and subsequent pest control or extermination is unknown.
- Colonization of native plant communities by invasive and exotic plant species can reduce and eliminate preferred food plants and alter habitat structure and microclimate and moisture regimes.

Conservation & Management Objectives

- Apply conservation and management objectives as set-out in the "Draft Gastropod Best Management Practices Guidebook Oregon Forestsnail and Other Land Snails at Risk in the Coastal Lowlands." Integrate complimentary objectives and recommendations found in the "COSEWIC assessment and status report on the Oregon forestsnail *Allogona townsendiana* in Canada."
- Inventory and assessment methods should follow those set out in the "Draft Gastropod Best Management Practices Guidebook Oregon Forestsnail and Other Land Snails at Risk in the Coastal Lowlands." Integrate appropriate measures as set out in the RISC Standards #40 "Inventory Methods for Terrestrial Arthropods." Assessments should not discount or solely rely on existing literature when scoping study areas for the potential presence of this or other land snail species. Snails may occupy different habitats in different landscapes and situations.
- Application of habitat suitability mapping as done for "Big Leaf Maple distribution for Puget Oregonian" found in the "Recovery Strategy for the Puget Oregonian Snail (*Cryptomastix devia*) in Canada" may be a useful model for Oregon forestsnail.

Specific activities should include:

- Determine the full range extent and areas of habitat suitability for these two land snail species on the Coast Region.
- Avoid salvage and relocation of snail populations to prevent competition impacts and extirpation of local populations. Little is known about carrying capacity of preferred plant communities.
- Avoid activities in areas of high suitability or known occurrence which alter habitat and microclimate regimes (controlled burns, invasive plant removal, clearing or salvaging/relocation during summer aestivation or winter hibernation periods).
- Maintain forest floor structure, including coarse woody debris, moist forest floor conditions, and connectivity.
- Implement integrated pest management approaches that reduce the need for chemical pest control and potential impacts to native land snails and slug species
- Increase education and outreach with private property owners and resource use intereststo improve knowledge about the value of these unique terrestrial mollusks and the impacts of land use activities.

Oregon forestsnail is federally listed under the Species at Risk Act (SARA), habitat for both Oregon forestsnail and Pacific sideband may be subject to protections and prohibitions under the BC Wildlife Act and may also be governed under other 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

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Prepared by: Pamela Zevit of Adamah Consultants and Kristiina Ovaska and Lennart Sopuck Biolinx Environmental for the South Coast Conservation Program (SCCP) in partnership with: International Forest Products (Interfor), Capacity Forestry (CapFor) and the BC Ministry of Environment (BC MoE), E-Flora and E-Fauna the Electronic Atlas of the Flora and Fauna of BC, Species at Risk & Local Government: A Primer for BC. Funding for this factsheet was made possible through the Sustainable Forestry Initiative (SFI): http://www.sfiprogram.org/

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 July 2012.

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