



## Blue-grey Taildropper

Photo: © Kristina Ovaska



### Scientific name

*Prophysaon coeruleum*

### Taxon

Molluscs

### COSEWIC Status

Threatened

### Canadian range

British Columbia

### Reason for Designation

This small, slender blue-coloured slug is only found in western North America where it lives in the moist layer of fallen leaves and mosses in mixed-wood forest. In Canada, it is confined to the southeastern tip of Vancouver Island within the Coastal Douglas-fir biogeoclimatic zone and where it transitions into the Coastal Western Hemlock biogeoclimatic zone. These habitats are declining in extent and what remains is becoming increasingly fragmented. Fifteen subpopulations are currently known, an increase that has resulted in a change of status. A continuing decline in habitat quality is expected due to natural ecosystem modification and competition with invasive species as well as droughts and severe weather events from climate change.

## Wildlife Species Description and Significance

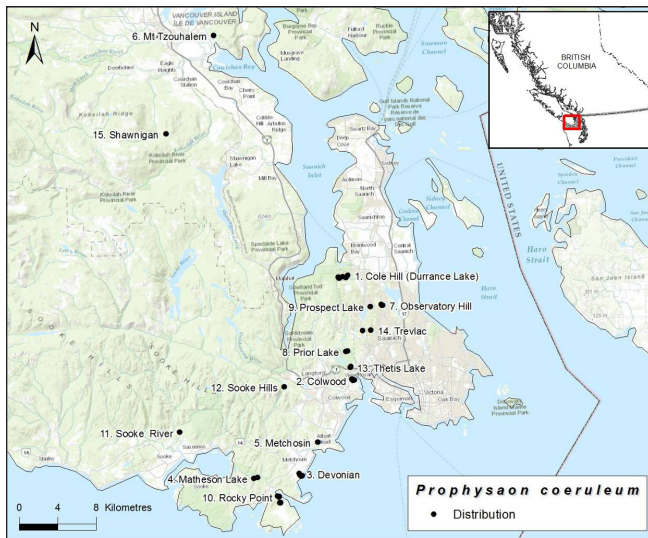
Blue-grey Taildropper (*Prophysaon coeruleum*) is a small slender slug (Arionidae: Anadeninae) with adults measuring between 20 – 40 mm in length. Distinguishing features include solid blue-grey colour without stripes and distinct, parallel grooves and ridges on the back and sides of the tail. As in other taildroppers (genus *Prophysaon*), a thin, oblique constriction or impressed line is usually visible on the tail at the site where autotomy (self-amputation) takes place, if the slug is attacked by a predator.

Blue-grey Taildropper may act as a dispersal agent for spores of fungi that form symbiotic associations with tree roots, thereby performing an important ecological function.

### Distribution

Blue-grey Taildropper is endemic to western North America, where it occurs from southwestern British Columbia south through the Puget Lowlands and Cascade Range of Washington State into Oregon and northern California; a disjunct population exists in northern Idaho. In Canada, Blue-grey Taildropper is documented only from southern Vancouver Island, where 15 subpopulations are known. All but two records are from within the Capital Regional District. In 2013, the species was found in the North Cowichan District, approximately 28 km north of the nearest record, followed by a second observation in the general area in 2015.

The estimated range (extent of occurrence) of Blue-grey Taildropper in Canada has increased from 150 km<sup>2</sup> to 658 km<sup>2</sup> since the previous status report, reflecting increased search effort over the past decade. Undocumented localities probably exist, but it is highly unlikely that there would be large additions to their range given the extensive search effort on southern Vancouver Island; hundreds of localities have been searched for terrestrial gastropods on Vancouver Island and the adjacent coastal mainland of British Columbia.



Canadian distribution of the Blue-grey Tailedropper (*Prophysaon coeruleum*). Map provided by Jenny Wu, COSEWIC Secretariat.

## Habitat

Blue-grey Tailedropper inhabits low-elevation (< 250 m above sea level) mature or maturing second growth mixed-wood forest (>60 years old) on the drier southeastern tip of Vancouver Island within the Coastal Douglas-fir biogeoclimatic zone and where it transitions into the Coastal Western Hemlock biogeoclimatic zone. These habitats are declining rapidly in extent and becoming seriously fragmented due to urban and rural development. The Coastal Douglas-fir biogeoclimatic zone is one of the most disturbed ecosystems of British Columbia. This zone contains several rare and provincially listed Douglas-fir, Garry Oak and Arbutus ecosystems, where Blue-grey Tailedropper has been found, although it is not restricted to these habitats. The slugs are patchily distributed within the landscape. Small forest gaps and woodland habitats may be favoured over deeper forest at the northern limits of the species' distribution, as they capture the sun and provide relatively warm forest floor conditions. Availability of suitable moist refuges, such as provided by abundant coarse woody debris and/or a deep moss layer, is thought to be important.

## Biology

Blue-grey Tailedropper appears to have an annual life cycle, maturing and reproducing within one year and overwintering as eggs. In British Columbia, juveniles have been observed in April – June, while almost all adults have been found in September – December; one adult was found in March, indicating successful overwintering by at least some adults.

Blue-grey Tailedropper feeds extensively on fungi. A variety of vertebrate and invertebrate predators, native and introduced, prey on slugs and probably also on this species. Blue-grey Tailedropper is capable of self-amputation of the tail, an adaptation that is an effective anti-predation mechanism against some predators. Blue-grey Tailedroppers are thought to have very limited dispersal capabilities, in the order of tens to hundreds of metres per generation.

## Population Sizes and Trends

There are no reliable population estimates but rough estimates at four sites in one year resulted in a minimum of 50 – 125 adults per ha. Extrapolation of these densities to known occupied areas results in a population size of 1,800 - 4,500 adults. The total Canadian population, including undiscovered sites, is probably <10,000 individuals. However, the species is patchily distributed in the habitat, making population size estimates difficult. Blue-grey Tailedropper was first documented from British Columbia only in 2002, and nothing is known of its long-term population fluctuations or trends. During field verification surveys in autumn 2014, the species was found at six of 18 known sites revisited. While the habitat at most sites remained unchanged, it had deteriorated at six sites where the species was not found due to encroachment by invasive plants, recreational activities, and/or development. Blue-grey Tailedropper occurs in two habitat patches that are smaller than 20 ha, the minimum thought to be required for long-term viability, and three others are in heavily fragmented rural landscapes. The remaining ten subpopulations are in habitats with at least some connectivity to larger areas of forest.

## Threats and Limiting Factors

Blue-grey Taildropper exists at the northern extremity of its geographic range in southwestern British Columbia. Low dispersal ability and requirements for moist habitats limit the speed with which the slugs can colonize new habitats or habitat patches from which they have become extirpated.

Main threats to Blue-grey Taildropper are from natural ecosystem modification by non-native invasive plants, competition and predation by introduced invertebrates, and from droughts associated with climate change and severe weather. Introduced invasive plants are prevalent at many Blue-grey Taildropper sites on Vancouver Island and deteriorate habitat quality by displacing native plants and altering the microclimate and possibly food supply for slugs. Non-native gastropods and other invertebrates, such as ground beetles (Coleoptera: Carabidae) pose a threat through predation and through competition for food and shelter. Prolonged and more frequent droughts are expected to reduce survivorship and length of time available for foraging and growth. Such effects can be expected to be particularly severe in degraded habitat patches that may lack microhabitats suitable for refuges. Other widespread threats include recreational activities and expanding housing and urban developments that contribute to habitat loss and degradation.

## Protection, Status and Ranks

Blue-grey Taildropper is listed as endangered on Schedule 1 under the Species at Risk Act. Globally, the species is ranked as “vulnerable – apparently secure”, G3G4 (rounded global status G3). Blue-grey Taildropper is on the provincial Red List of species at risk, which includes species that are extirpated, endangered, or threatened in British Columbia, and is ranked as “critically imperilled” (S1).

Most subpopulations are either entirely or partially on federal lands (Department of National Defence, National Research Council), in Capital Regional District Parks and Trails System, or in municipal parks and are protected from land conversions at least over the short term. Three subpopulations and a portion of a fourth one are within rural private lands. Additional sites may exist on private lands.

Source: COSEWIC. 2016. COSEWIC assessment and status report on the Blue-grey Taildropper *Prophysaon coeruleum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 50 pp.

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