

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

Johnson's Hairstreak (*Callophrys johnsoni*)

Global: G3G4, Provincial: S1S2, COSEWIC: N/A, BC List: Red Identified Wildlife



Adult



Larva

Notes on *Callophrys johnsoni*: A member of the family Lycaenidae (“Gossamer Winged” butterflies), the second largest global family of butterflies. Johnson's Hairstreak is also referred to as “Mistletoe” Hairstreak or “Brown Mistletoe” Hairstreak, a reference to the larval dependence on subspecies of mistletoe. Larvae emit a sugary solution through a “honey gland” (dorsal nectary organ). Ants feed on the solution and in turn protect the caterpillar from predators.

Description

Wingspan: 2.5-3.5 cm. Adult males and females are similar, with subtle colouration differences on the uppersides of both sets of wings. Males are chocolate-brown except for an orange-brown ‘tail’, females are more reddish or orange-brown except for brown on the wing margins and the area near the tail. Undersides of wings of both sexes are brown with a thin, jagged white line, bordered with black, running across both sets of wings on the inside edge. The hindwing has a small “tail” with a few black dots and bluish and orange scales. Males have larger eyes than females, which may assist in detecting mates. Larvae are green or yellowish-olive with red, green, yellow, or white markings and lighter raised chevrons that somewhat resemble “scutes” (bony protrusions or scales), that run down the dorsal area. Hibernating pupae are dark brown.

Diet

Larval food sources include all exposed plant parts of types of dwarf mistletoe, which in BC is typically hemlock dwarf mistletoe (*Arceuthobium ssp.*), associated with western hemlock and Douglas-fir stands. Adults exploit nectar on wildflowers growing in forest and riparian openings such as dull Oregon grape, goatsbeard, salmonberry and thimbleberry.

Look's Like?

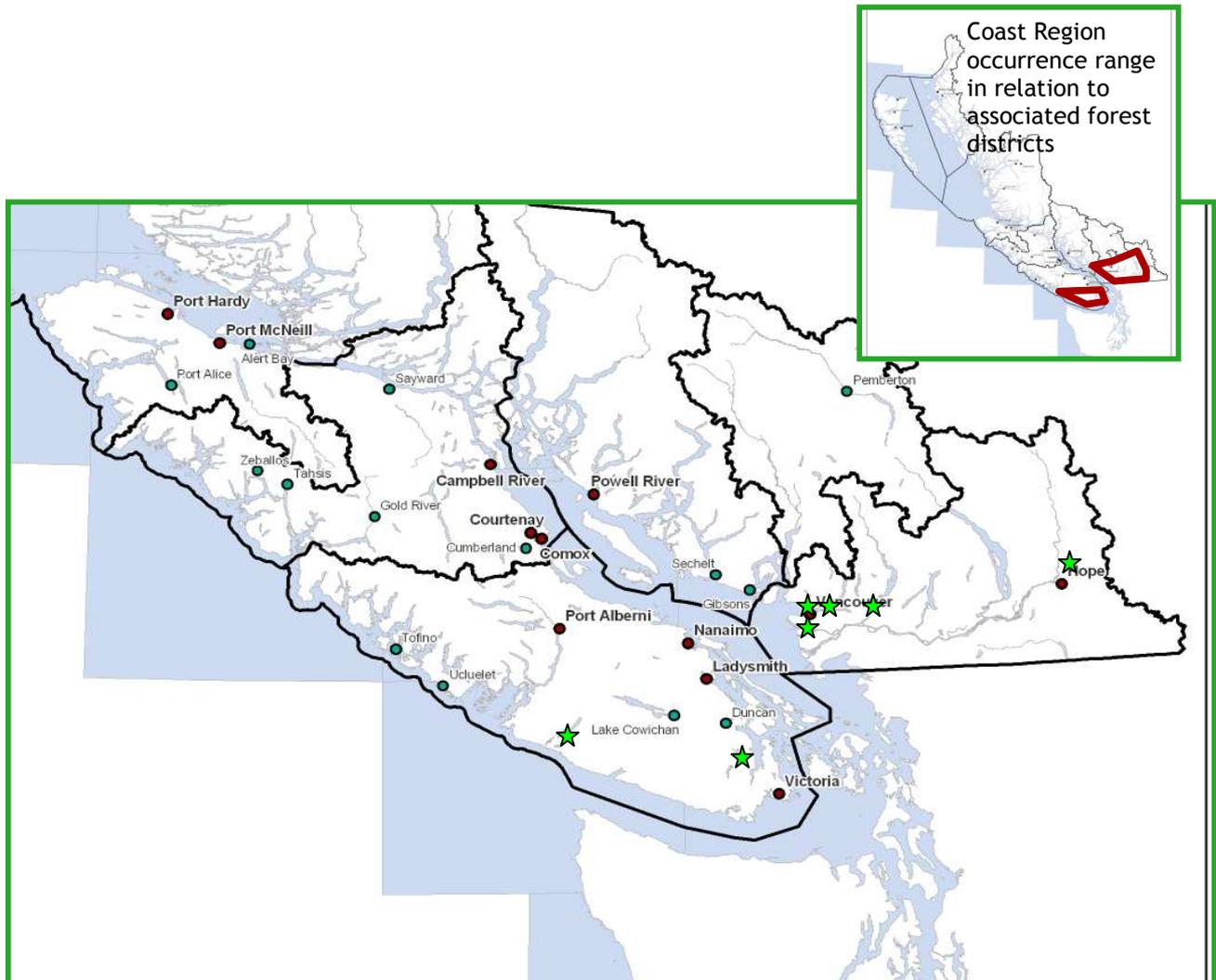
The more common Cedar Hairstreak, though much smaller, overlaps in distribution and is the most likely species to be confused with Johnson's Hairstreak. The ventral wing pattern of Cedar Hairstreak appears washed out compared to Johnson's Hairstreak and the ventral jagged white line, which runs midway along both sets of wings, is bordered with amber instead of black.



Cedar Hairstreak

Distribution

Found in low elevation areas usually <625 m. This species is found through western Oregon, Washington State and north into the southwest portion of the Coast Region in BC. Historically the species ranged from southeast and southwest Vancouver Island (Shawnigan Lake, Nitinat Lake) and the South Coast (Fraser Lowlands to Spuzzum in the Fraser Canyon). Recent occurrences have been limited to a handful of locations on the South Coast (Stanley Park, Pacific Spirit Regional Park, Lynn Canyon Park on the North Shore of Burrard Inlet and the University of B.C.'s Haney Research Forest in Maple Ridge). This species may be more widely distributed in forested habitats where the larval host plant (hemlock dwarf mistletoe), which typically infect western hemlock, occurs.



Johnson's Hairstreak (*Callophrys johnsoni*), known historic and recent occurrences (green stars), for the Coast Region.

Habitat Preferences *Johnson's Hairstreak* occurs within dwarf mistletoe-infected forests (typically mature or old-growth stages), which it needs to reproduce. Adults frequent forest openings, riparian areas and forest edges with abundant wildflowers. Adults will utilize nectar food plants within clearcuts and artificial edge openings as long as they are within sufficient proximity to forested habitats.

Critical Features Hemlock dwarf mistletoe is a perennial parasite, seeds are dispersed when the plant matures and flowers after 2-3 years (bottom left). The naturally sticky seeds are spread through explosive ejection, showering nearby trees and taking 'root' where they hit branches and foliage. As the seed germinates and grows, the "infection" produces swelling and deformities in the trees branches ("witch's brooms"), or trunk.

Seasonal Life Cycle
 In BC, *Johnson's Hairstreak* larvae require hemlock dwarf mistletoe to complete their lifecycle. Infected trees and stands are typically cleared as part of stand management practices as they create hazard trees as well as reducing economic value of timber.

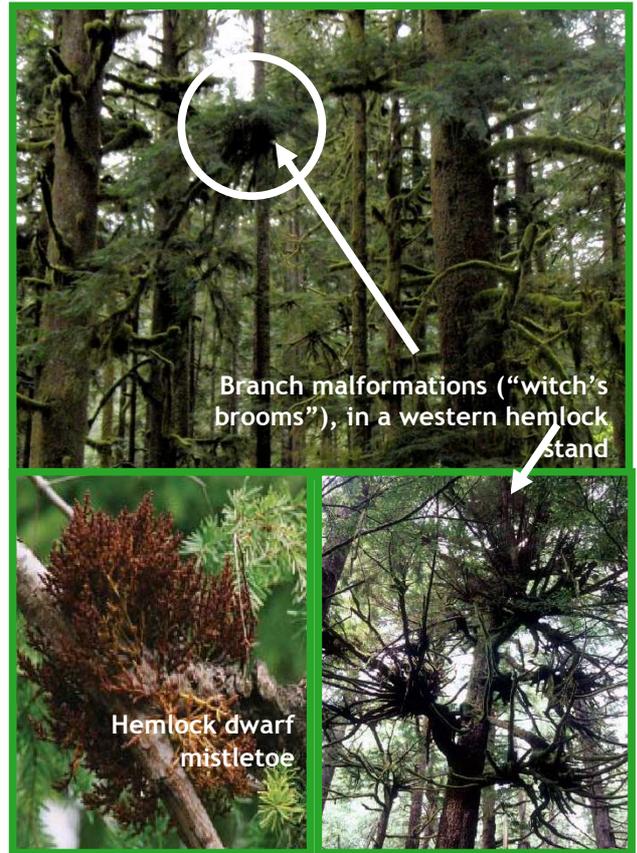
| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|--|-----|-----|-----|-----|--|-----|-----|-----|-----|-----|-----|
| | | | | | Adult emergence, Breeding / Egg Deposition | | | | | | |
| Larval development and maturation stages | | | | | | | | | | | |

Threats

- ◆ This species is naturally rare and preferred habitat over its range (low elevation, structurally diverse, old growth/mature forests) has been severely reduced over the last century. Remaining populations, especially undetected ones, are vulnerable to extirpation when trees or stands infected with the preferred larval host plant are cleared or eliminated as part of silviculture or hazard management practices.
- ◆ The larval host plant occurs in the forest canopy and is difficult to inventory. As well adult butterflies are typically found in very small numbers and may be hard to detect within forested communities.
- ◆ Impacts to all life stages as well as host plant communities from land management practices from pesticide applications for silviculture management and insect pest control (i.e. gypsy moth).
- ◆ Severe wildfire events and changes in forest health and species composition, which may increase as a result of climate change.
- ◆ Invasive shrubs and grasses which may invade as a result of clearing for timber harvesting or development can displace preferred adult nectar food plants.

Conservation & Management Objectives

- ◆ Apply conservation and management objectives for this species as set out in the "Accounts and Measures for Managing Identified Wildlife - Accounts V. *Johnson's Hairstreak* Butterfly *Loranthomitora johnsoni*." Integrate complimentary measures for conservation identified by the Xerces Society's Factsheet on *Johnson's Hairstreak* and "Sentinels on the Wing: The Status and Conservation of Butterflies in Canada." The Province of BC (former Ministry of Forests), and more recently the USDA Forest Service, provide extensive resources for integrated management approaches for dwarf mistletoe - the larval host plant for this butterfly species.
- ◆ Inventory and assessment methods should follow RISC Standards #40 "Inventory Methods for Terrestrial Arthropods", however a more recent "Survey Protocol for *Johnson's Hairstreak* Butterfly (*Callophrys johnsoni*) in Washington and



One brood is produced per year. Adults fly from late May to early July. Larvae mature and pupate quickly after eggs hatch. This species overwinters as a pupa. *Timing of adult emergence, larval maturation, and pupation/hibernation are affected by temperature and elevation and may vary by host plant growth periods.

Oregon (v1.2) provides more up-to-date survey and inventory guidance for this species. Other online survey and identification resources include the Butterflies and Moths of North America, the Royal BC Museum's "Living Landscapes: Pend-d Oreille Butterfly Survey" as well as other Provincial butterfly collection and reconnaissance inventory methods¹.

Specific activities should include:

- ◆ Dedicated inventory efforts are needed to fill gaps on the biology of this species and its existing and potential distribution in BC.
- ◆ Improve understanding of larval host plant dependencies and seek ways in which the host plant for this species can be managed without large-scale clearing. Creation of Wildlife Habitat Areas ("WHA's"), under the Forest and Range Practices Act may be a means to protect populations in unprotected areas.
- ◆ Increase awareness about the sensitivity and value that dwarf mistletoe provides to other species including creation of wildlife trees and forest structural diversity.
- ◆ Further research is needed to assess the potential impacts to this species and its ecological associations from invasive species, wildfire and climate change.
- ◆ Work to reduce the need for broadcast and cosmetic pesticide use that may be impacting non-target species through instituting integrated pest management programs. Encourage landowners and land use authorities to dedicate conservation covenants and cultivation/vegetation management easements to protect host plant associations.

This species is Identified Wildlife under the Provincial Forest and Range Practices Act and may be 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

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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 March 2012.

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¹ Contact the provincial invertebrate specialist in Victoria.