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## **Appendix 5.4.15A**

# **Jutta Arctic Species Account**

**PROJECT NAME:** *Blackwater*

**Scientific Name:** *Oeneis jutta chermocki*  
**Species Code:** IL-OENJUT-CH  
**Status:** Blue-listed (ecological communities and indigenous species and subspecies of special concern in British Columbia)

*Oeneis jutta* is an Asian butterfly whose name is incorrectly applied to North American butterflies by most North American authors. The correct species name for North American populations is *Oeneis balderi* (Geyer, 1837) (refer to notes in Pohl et al., 2010). The species name *O. jutta* is used in this species account because that is the name currently used by the British Columbia Conservation Data Centre.

Guppy and Shepard (2001) incorrectly use the subspecies name *reducta*, which does not occur in Canada, for subspecies *chermocki*.

The central BC populations of subspecies *chermocki* are geographically separated from the Rocky Mountain populations, with the Robson Valley and Cariboo Mountains in between. The central BC populations are apparently an unnamed subspecies of the butterfly. The name *chermocki* is used in this species account because that is the name currently used by the BC Conservation Data Centre.

The taxonomic uncertainties for this butterfly to not affect this Species-Habitat Model, because the model is based only on the central BC populations.

## 1.0 DISTRIBUTION

### Provincial Range

Jutta Arctic in BC is distributed in the Rocky Mountains of the Kootenays and northeastern BC, and in the mountains of northern BC near the Yukon border. Subspecies *chermocki* occurs in the Rocky Mountains in southeastern BC and in central BC (Guppy and Shepard, 2001). Most of the central BC location records for subspecies *chermocki* were not mapped by Guppy and Shepard (2001), which is the most recent relevant reference for this species, because the locations were found after publication. The available records are from Guppy and Shepard (2001) and from Crispin Guppy's personal database (**Table 1**).

**Table 1 Provincial Locations of Jutta Arctic**

Location	El.(m)	Latitude	Longitude	Date	Data Source
Fort St. James; Cripple Lake (North Road, east end of lake)	879	54.90000	-124.10000	2001-07-08	C.S. Guppy database
Fort St. James; Hyman Creek (15 Mile Road km 7.1)	789	54.58333	-124.05000	2001-07-08	C.S. Guppy database

Location	El.(m)	Latitude	Longitude	Date	Data Source
Fort St. James; Kuskwa River (1-3 km W of Leo Creek FSR)		54.78333	-124.73333	2001-07-12	C.S. Guppy database
Fort St. James; Leo Creek (Driftwood FSR km 1.5)	954	55.08333	-125.53333	2001-07-13	C.S. Guppy database
Davidson Creek area; black spruce/grass/moss bog	1361	53.19451	-124.94965	2011-08-01	C.S. Guppy database
Davidson Creek area; black spruce/ pine/horsetail/grass wetland	1360	53.19511	-124.94980	2011-08-01	C.S. Guppy database
Davidson Creek area; black spruce/ sedge wetland	1357	53.19617	-124.94898	2011-08-01	C.S. Guppy database
Davidson Creek area; black spruce/ pine/sedge wetland	1362	53.19690	-124.94662	2011-08-01	C.S. Guppy database
Davidson Creek area; black spruce/ pine/sedge wetland	1363	53.19867	-124.94562	2011-08-01	C.S. Guppy database
Davidson Creek area; black spruce/ sedge wetland	1376	53.20067	-124.94408	2011-08-01	C.S. Guppy database
Davidson Creek area; scrub birch/ willow/sedge/moss wetland	1127	53.24041	-124.82317	2011-08-04	C.S. Guppy database
Davidson Creek area; scrub birch/ willow/sedge/moss wetland	1140	53.24041	-124.82317	2011-08-04	C.S. Guppy database
Davidson Creek area; black spruce/ sedge swamp	1061	53.25524	-124.75124	2011-06-27	C.S. Guppy database
Davidson Creek area; edge of spruce/ pine bog	1060	53.25662	-124.74905	2011-06-27	C.S. Guppy database
Davidson Creek area; edge of pine/black spruce bog	1062	53.25720	-124.74826	2011-06-27	C.S. Guppy database
Davidson Creek area; black spruce, scrub birch, willow, sphagnum, Ledum bog	1119	53.25896	-124.84285	2011-08-04	C.S. Guppy database
Davidson Creek area; Top Lake FSR Km 1; black spruce bog edge along sedge wetland	1098	53.25845	-124.95118	2011-07-10	C.S. Guppy database
Davidson Creek area; sparse black spruce, birch, willow, sphagnum	1057	53.36797	-124.72235	2012-07-07	C.S. Guppy database
Nazko; Clisbako River; 4200 B Road south of 13.3 km; open immature pine forest about 20 m from sedge wetland	1232	52.70406	-123.82727	2009-07-21	C.S. Guppy database
Nazko; Lava Lake (200m south; black spruce wetland)	1165	52.91637	-123.73020	2001-06-20	C.S. Guppy database
Quesnel; Spruce Lake; Schiste Creek (black spruce bog)	869	52.91667	-122.33333	2001-06-24	C.S. Guppy database
Quesnel; Spruce Lake; Schiste Creek (black spruce bog)	869	52.91667	-122.33333	2003-07-10	C.S. Guppy database
Cottonwood River (north of Quesnel) vicinity					Guppy and Shepard (2001)
Blackwater Road (Baldy Hughes vicinity)					Guppy and Shepard (2001)
Jesmond vicinity					Guppy and Shepard (2001)

## **Elevational Range**

Elevations 789 m to 1,376 m are from known records. The boundaries of the SBS and SBPS biogeoclimatic zones are probably a reasonable approximation of the actual elevational range.

## **Adult Flight Season**

The recorded specimen dates are June 20 to July 13 (normal seasons), with August 1 to 4 recorded in 2011. The August 2011 dates are from a year with a very late flight season, due to most of June and July being abnormally cool, cloudy and wet in central BC. The normal flight season is estimated to be June 15 to July 30, with most butterflies typically flying June 20 to July 20 in summers with typical weather.

## **Provincial Context**

Jutta Arctic, subspecies *chermocki* is poorly inventoried but apparently occurs throughout the central interior of BC. The habitat is open-canopy black spruce wetlands. The total distribution within central BC is presumably correlated with the occurrence of the habitat. This species-habitat model is concerned only with the central BC populations, which apparently occur throughout central BC where there is suitable habitat. The boundaries of the range of subspecies *chermocki* in central BC is unclear due to lack of inventory. Lack of inventory is the result of lack of butterfly inventory in general in black spruce wetlands.

## **Project Area**

The Project area is on the Fraser Plateau from Mount Davidson in the south to Highway 16 in the north. This species-habitat model is concerned only with the central BC populations within the area of the Project (mine and transmission line study areas). Crispin Guppy has discovered all but three of the known locations for the Jutta Arctic in central BC, and therefore his knowledge of the species elsewhere in the range is also incorporated into this species account.

Ecoprovince:	Central Interior
Ecoregions:	Fraser Plateau / Central Canadian Rocky Mountains
Ecosections:	Nazko Upland (NAU); Bulkley Basin (BUB)/Nechako Lowland (NEL)
Biogeoclimatic Zone:	Sub-Boreal Spruce (SBS)

**Project Map Scale:** 1:20,000

## 2.0 ECOLOGY AND KEY HABITAT REQUIREMENTS

Jutta Arctics fly and breed in wetlands with open-canopy black spruce forest; the black spruce is usually over 4 m tall (C.S. Guppy, unpub. observ.; Guppy and Shepard, 2001). There has been one observation in open-canopy white spruce forest, with the open-canopy resulting from wet, usually hummocky soil conditions (C.S. Guppy, undocumented observations east of Quesnel). Observations in dry pine forests are apparently the result of adults moving short distances away from black spruce wetlands to find warm, sunny sites to bask and possibly to feed on nectar. The presence of spruce trees is apparently a key habitat requirement, with the adults typically resting on the tree trunks or branches, or on course woody debris (CWD) on the ground, in sunny patches (C.S. Guppy, unpub. observ.). The bark-like wing pattern provides excellent camouflage when resting on conifer bark.

The herbaceous layer is dominated by sedges (*Carex* sp.); the sedges have not been identified to species (C.S. Guppy, unpub. observ.). The sedges are the presumed larval foodplant, based on sedges being the larval foodplant elsewhere in the range of the species (Guppy and Shepard, 2001). The edge of closed-canopy black spruce forest along a wetland can provide a narrow linear strip that is effective "open-canopy spruce forest." **Table 2** summarizes the key habitat features.

The adult flight period, and therefore the breeding period, extends from mid-June to late July, with considerable inter-year variation depending on warmth of the summers. Only one generation of adults flies each year (univoltine), and they apparently take two years to mature (biennial), with larvae hibernating twice (Guppy and Shepard, 2001; Layberry et al., 1998). The species is reported to fly in even-numbered years "in the west [of Canada]" (Layberry et al. 1998), but the flight dates in **Table 1** indicate that in central BC they fly primarily in odd-number years but with low numbers in even-numbered years.

Jutta Arctics are probably not territorial in the sense of actively defending a territory (contrary to Guppy and Shepard, 2001); however, males perching on trunks, branches, or CWD dart out to chase any similar-appearing butterfly to determine if is a female, resulting in the males spacing themselves out through the habitat to avoid repeated male-male encounters (C.S. Guppy, unpubl. obser.). Females fly through the forest, initially to find a male with which to mate, and then to find suitable oviposition sites. Adult feeding (on flower nectar) has apparently not been observed in this subspecies. It is likely that if any nectar-producing flowers present in the habitat will be fed upon, but flowers are rare in black spruce wetland (C.S. Guppy, pers. comm.).

**Table 2. Important habitat features for Jutta Arctic**

Season	Habitat Feature
All	<ul style="list-style-type: none"> <li>• Black spruce wetland</li> <li>• Low crown closure</li> <li>• Sedge (<i>Carex</i>) dominant in herbaceous layer</li> <li>• Flowers with nectar</li> </ul>

### 3.0 HABITAT USE: LIFE REQUISITES

#### Living

The life requisite that is rated for Jutta Arctic is 'Living', which is satisfied by the presence of suitable larval and adult habitats, as described in detail below.

#### Larval Habitat

Eggs and larvae of Jutta Arctic, subspecies *chermocki* have never been seen in the wild or reared in captivity. Accordingly the larval habitat description is based on where adults have been found, combined with knowledge of other subspecies elsewhere in North America. The larval habitat is apparently sedges (*Carex* species) that typically grow as the dominant species in the herbaceous layer of open-canopy black spruce wetlands. Cottongrass species (*Eriophorum* species) are used elsewhere in Canada as a larval foodplant (Guppy and Shepard 2001; Layberry et al. 1998), but are apparently absent from the habitats used in central BC. There is no information as to whether the presence of spruce trees is a requirement of larval habitat; however, it is unlikely that adults will lay eggs outside black spruce stands.

Eggs are presumably laid on the sedge larval foodplant leaves, the eggs hatch, and the larvae feed on the foodplant leaves. The larvae first hibernate when half-grown, and then again when fully grown; the hibernation site is unknown but may be in a silk web spun in the upper part of the sedge leaves. Pupation likely occurs in the same place as the second larval hibernation site. This life-history information is inferred from information from other subspecies in North America (Guppy and Shepard, 2001).

#### Adult Security/Reproduction Habitat

Spruce trees and downed CWD provide security and are part of reproduction habitat. The adult butterflies usually sit on the trunks of standing trees or downed CWD. This provides security through camouflage, with the bark-like pattern of the underside of the wings (they rest with their wings folded above their backs) an excellent match for the conifer bark they rest on. Adults also occasionally sit on the upper side of the needles of spruce tree branches; this seems to occur primarily when warm sunny patches on tree trunks or CWD are uncommon (C.S. Guppy, unpubl. obser.). Males use the trees and CWD as perches from which to dart out to investigate potential females flying past.

#### 4.0 SEASON OF USE

Jutta Arctic is a year-round resident of any habitat patch in which it occurs. Adults are typically in flight from mid-June to mid-July, mate, and lay eggs at that time. The eggs likely hatch in under two weeks, and the larvae feed on the sedge leaves until late summer. The half-grown larvae then hibernate through fall and winter, and commence feeding again in spring. Once mature, the larvae again hibernate through fall and winter, pupate in spring, and the adult emerges in mid-June.

Within a patch of habitat, eggs are present in July and August, larvae are present at almost all times, pupae are present in spring, and adults are present in mid-summer. Therefore, only one all- season rating is used. **Table 3** summarizes the life requisites required for each month of the year.

**Table 3. Monthly Life Requisites for Jutta Arctic**

Month	Season*	Life Requisites	Specific Time Period for Life-Stages
January	Winter	Living	Hibernating larvae
February	Winter	Living	Hibernating larvae
March	Winter	Living	Hibernating larvae
April	Winter	Living	Hibernating larvae
May	Spring	Living	Larvae; pupae
June	Spring	Living	Pupae; adults; eggs
July	Summer	Living	Adults; eggs; larvae
August	Summer	Living	Larvae
September	Fall	Living	Hibernating larvae
October	Fall	Living	Hibernating larvae
November	Winter	Living	Hibernating larvae
December	Winter	Living	Hibernating larvae

\*Seasons defined as per the Chart of Seasons (Ministry of Environment, Lands and Parks 1999).

#### 5.0 HABITAT USE AND ECOSYSTEM ATTRIBUTES

**Table 4** outlines how each life requisite relates to specific ecosystem attributes.

**Table 4. Terrestrial Ecosystem Mapping (TEM) Relationships for each Life Requisite for Jutta Arctic.**

Life Requisite	TEM Attribute
Living Habitat (eggs, larvae, pupae, adults)	<ul style="list-style-type: none"> <li>• Site series/wetland type: structural stage</li> <li>• Vegetation: % cover by layer</li> <li>• Mensuration: tree species; height; crown closure</li> </ul>

## 6.0 RATINGS

There is an intermediate level of knowledge on the habitat requirements of Jutta Arctic in BC and therefore, a 4-class rating scheme is used.

### Provincial Benchmark

Ecosection: Nazko Upland (NAU)

Biogeoclimatic Zones: SBS; SBPS

Habitats: Black spruce wetlands with open canopies. Also, a 10 m wide interface between close-canopy black spruce forest (wetland or terrestrial) and non-forested wetland.

### Ratings Assumptions

- Units consisting of black spruce wetland with open canopy will be rated 'high' living habitat.
- Units consisting of black spruce wetland with closed canopy will be rated as 'nil' living habitat, except for a 10 m wide strip along the interface with a non-forested wetland.
- Units with lower crown closure will be rated higher than units with higher crown closure.

**Table 5** summarizes the habitat requirements for Jutta Arctic in the study area for the seasons and life requisites being modelled.

**Table 5. Habitat requirements for each Life Requisite for Jutta Arctic**

Season	Life Requisite	Structural Stage	Crown Closure	Requirements
All Seasons	Living (Larvae)	3-8	1-6	Black spruce wetland with <i>Carex</i> sedge-dominated herbaceous layer, open canopy
	Living (Adults)	3-8	1-6	Black spruce wetland with <i>Carex</i> sedge-dominated herbaceous layer, open canopy

\*The habitat requirements are stated separately for adults and larvae, despite being identical, to emphasize that differences are possible but unknown due to lack of research.

## 7.0 RATINGS ADJUSTMENTS

Ratings adjustments (downward) may be required for habitat patches:

- Impacted by windthrow resulting from loss of adjacent upland forest, through wildfire or harvesting;
- With a high proportion of the black spruce being dead; or



- With lodgepole pine (living or dead) mixed with the black spruce.

## **8.0 LITERATURE CITED**

Guppy, C.S. and J.H. Shepard. 2001. Butterflies of British Columbia. Vancouver, BC: UBC Press. 414 pp.

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