

COSEWIC
Status Appraisal Summary

on the

Edwards' Beach Moth
Anarta edwardsii

in Canada

ENDANGERED
2021

COSEWIC status appraisal summaries are working documents used in assigning the status of wildlife species suspected of being at risk in Canada. This document may be cited as follows:

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Production note:

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COSEWIC Assessment Summary

Assessment Summary – April 2021

Common name

Edwards' Beach Moth

Scientific name

Anarta edwardsii

Status

Endangered

Reason for designation

This handsome, grey moth lives in sparsely-vegetated coastal dunes and upper beaches at only six sites on Vancouver Island and adjacent Gulf Islands; two of these subpopulations may be extirpated. The moth's habitats are at risk from increasing vegetation encroachment (by both native and non-native plant species), recreational activities, and loss of sand as a result of increasing frequency, severity and intensity of winter storms, compounded by sea level rise.

Occurrence

British Columbia

Status history

Designated Endangered in April 2009. Status re-examined and confirmed in May 2021.



COSEWIC Status Appraisal Summary

Edwards' Beach Moth

Noctuelle d'Edwards

Anarta edwardsii

Range of occurrence in Canada: British Columbia

Status History:

Designated Endangered in April 2009. Status re-examined and confirmed in May 2021.

Wildlife species

SAS 6	Change in eligibility, taxonomy or designatable units:	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
Explanation:		
The taxonomy has not changed since the first COSEWIC (2009) status assessment.		

Range

SAS 7	Change in Extent of Occurrence (EOO):	yes <input checked="" type="checkbox"/> no <input type="checkbox"/> unk <input type="checkbox"/>
SAS 8	Change in Index of Area of Occupancy (IAO):	yes <input type="checkbox"/> no <input checked="" type="checkbox"/> unk <input type="checkbox"/>
SAS 9	Change in number of known or inferred current locations:	yes <input type="checkbox"/> no <input checked="" type="checkbox"/> unk <input type="checkbox"/>
SAS 10	Significant new survey information	yes <input checked="" type="checkbox"/> no <input type="checkbox"/>
Explanation:		
Six subpopulations ¹ of Edwards' Beach Moth are known in Canada (Figure 1): four extant ² and two historical ³ (Table 1) (COSEWIC 2009).		

¹ Subpopulations are defined as geographically or otherwise distinct groups in the overall Canadian population between which there is little demographic or genetic exchange (typically one successful migrant individual or gamete per year or less). Subpopulation size is measured as numbers of mature individuals only (i.e., adult Edwards' Beach moths) (IUCN 2001).

² Confirmed presence of Edward's Beach Moth within the past 20 years.

³ Known from only historical records but still some hope of rediscovery. There is evidence that the species may no longer be present at the site, but not enough to state this with certainty. For Edward's Beach Moth, historical refers to no documentation for approximately 20-40 years despite some searching.

Table 1: Subpopulations of Edwards' Beach Moth (*Anarta edwardsii*) in Canada (B.C. CDC 2019).

Subpopulation ⁴ Number	Years Recorded	Recent Surveys	Subpopulation Status	Land Ownership	Reference
1. Thetis Island	1966 and 1971	No surveys within the past ten years; vague collection locality. Current aerial imagery shows some habitat, particularly areas between south Thetis and Peleikut Islands.	Historical	Unknown, likely private	B.C. CDC 2019
2. Mill Bay	1935	Not within the past ten years, vague collection locality and current aerial imagery suggests there is minimal habitat within this general geographic area.	Historical	Unknown, likely private	B.C. CDC 2019
3. James Island	2007	Habitat assessments in the past ten years suggest the species is likely extant (Gelling pers. comm. 2019; Heron pers. comm. 2019).	Extant	Private conservation land; Nature Conservancy Canada	B.C. CDC 2019
4. Cordova Shore, Sidney	1994-1995; 2014 - 2019	2014-2019 (Gatten pers. comm. 2019)	Extant	Three landowners/managers: Municipality of Central Saanich (local government, private land), Tsawout First Nation (federal), and Capital Regional District (local government, private land)	ECCC 2017; B.C. CDC 2019
5. Sidney and Hook Spits, Sidney Island	2001-2006	2014, 2019 (no specimens recorded during these surveys).	Extant	Federal government; Parks Canada Agency	Davies pers. comm. 2019; B.C. CDC 2019
6. Wickaninnish Beach, Tofino	2001	2014, 2016 (no specimens recorded during these surveys).	Extant ⁵	Federal government; Parks Canada Agency	Collyer pers. comm. 2019

The extent of occurrence (EOO) has changed from 2050 km² in the initial COSEWIC (2009) assessment to 659 km² (Figure 2). This change is because the COSEWIC (2009) report considered Thetis Island (#1) and Mill Bay (#2) as extant subpopulations in the EOO; these subpopulations are now considered historical and not included in the EOO. The records at both localities are > 50 years old. The index of area of occupancy (IAO) remains unchanged at 20 km² (four extant subpopulations: Figure 2).

Subpopulations are grouped into two locations⁶. Subpopulations #1-5 form a location on the east coast of southern Vancouver Island and adjacent Gulf Islands, while #6 forms the second location on the west coast of southern Vancouver Island. These two locations are geographically distinct, and each is defined by the unifying threat of increased flooding, droughts, and storm surges (from climate change), resulting in habitat loss (see **Threats**). This approach is the same as was done in the first COSEWIC (2009) status assessment.

⁴ Numbers refer to the subpopulation localities in Figure 1.

⁵ The number of moths recorded from this site in 2001 is unknown (COSEWIC 2013).

⁶ The term 'location' defines a geographically or ecologically distinct area in which a single threatening event can rapidly affect all individuals of the taxon present. The size of the location depends on the area covered by the threatening event and may include part of one or many subpopulations. Where a taxon is affected by more than one threatening event, location should be defined by considering the most serious plausible threat. Where the most serious plausible threat does not affect all the taxon's distribution, other threats can be used to define and count locations in those areas not affected by the most serious plausible threat. (Source: IUCN 2010, 2011). In the absence of any plausible threat for the taxon, the term "location" cannot be used and the sub-criteria that refer to the number of locations will not be met. (Source: IUCN 2010, 2011).

There is new survey information on Edwards' Beach Moth since the first COSEWIC (2009) status assessment. There are records and null survey data for 209 collection events from 2014-2019 (Collyer pers. comm. 2019; Davies pers. comm. 2019; Gatten pers. comm. 2019; Gelling pers. comm. 2019; B.C. CDC 2019) (Appendix 1).

A subpopulation of Edwards' Beach Moth was confirmed at Sidney and Hook Spits on Sidney Island (#5) in 2014 and 2019 (Davies pers. comm. 2019). The species was also identified in multiple years of surveys at Cordova Spit and Island View Beach (#4), where it had previously been undetected since 1994. Edwards' Beach Moth was not detected at Wickaninnish Beach (#6) despite 172 trap days of collection effort (Collyer pers. comm. 2019; Davies pers. comm. 2019). This site is represented by an unknown number of specimens, collected in 2001 (COSEWIC 2009).

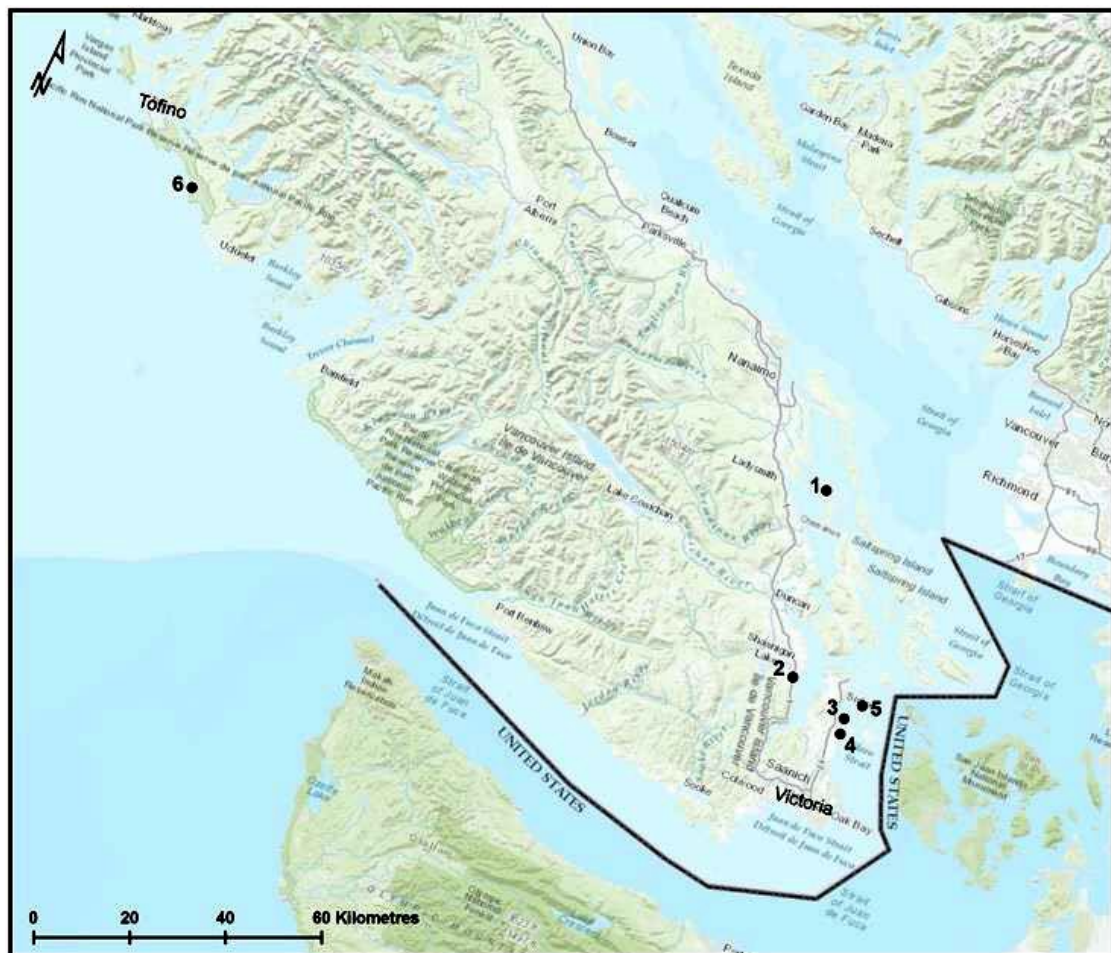


Figure 1. Edwards' Beach Moth (*Anarta edwardsii*) subpopulations in Canada. See Range for subpopulation details. Map created by Sydney Allen (COSEWIC Secretariat).

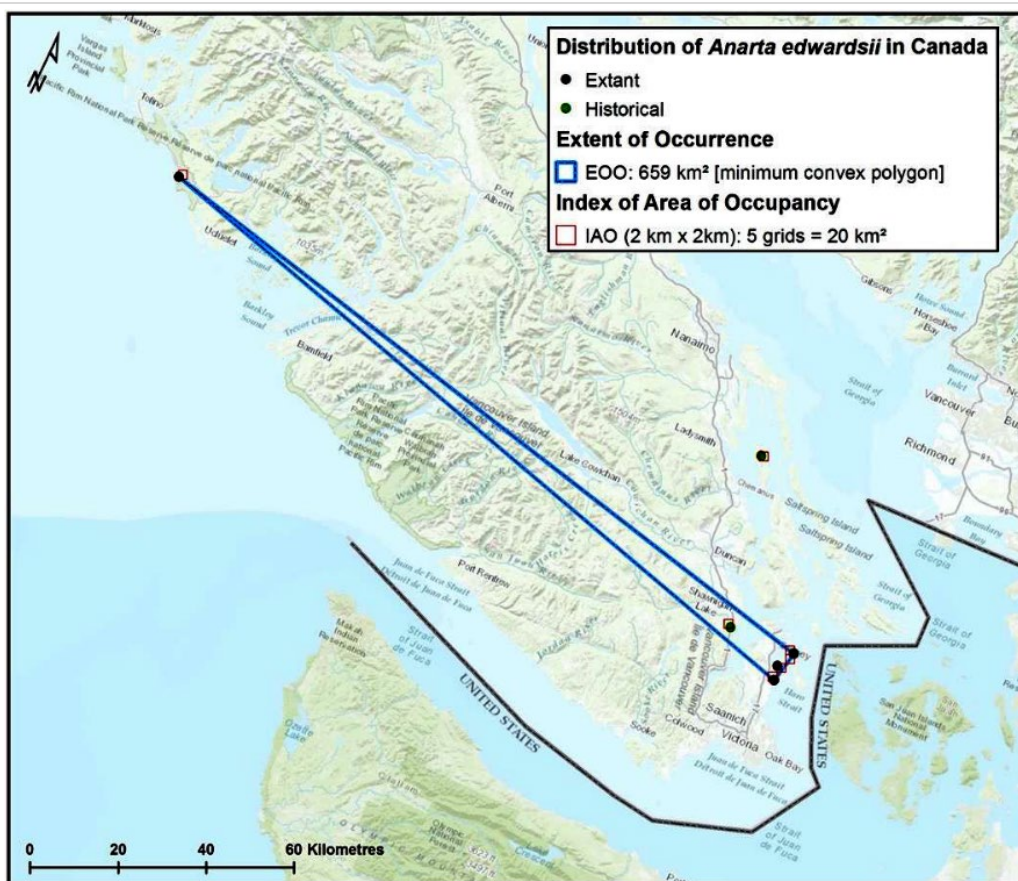


Figure 2. Edwards' Beach Moth (*Anarta edwardsii*) extent of occurrence (EOO) and index of area of occupancy (IAO) in Canada. Map created by Sydney Allen (COSEWIC Secretariat).

Population Information

SAS 11	Change in number of mature individuals:	yes <input type="checkbox"/> no <input type="checkbox"/> unk <input checked="" type="checkbox"/>
SAS 12	Change in population trend:	yes <input type="checkbox"/> no <input type="checkbox"/> unk <input checked="" type="checkbox"/>
SAS 13	Change in severity of population fragmentation:	yes <input type="checkbox"/> no <input type="checkbox"/> unk <input checked="" type="checkbox"/>
SAS 14	Change in trend in area and/or quality of habitat:	yes <input type="checkbox"/> no <input type="checkbox"/> unk <input checked="" type="checkbox"/>
SAS 15	Significant new survey information	yes <input checked="" type="checkbox"/> no <input type="checkbox"/>

Explanation:

A Canadian population estimate for Edward's Beach Moth was not calculated for the 2009 COSEWIC assessment or since due to insufficient data and the uncertainties in measuring capture success and suitable habitat.

The continuing loss and degradation of the moth's sand ecosystem habitat due to erosion from an increase in intensity and severity of storm surges, invasive non-native/native plant encroachment into the open sand ecosystem habitats, thereby stabilizing these habitats, and other factors (see **Threats**) would indicate the Canadian population is declining.

A change in severity of population fragmentation is unknown, but the six subpopulations are widely separated by unsuitable habitat and open ocean. It is unknown if the trend in area and/or quality of habitat has changed since the last COSEWIC (2009) assessment; however, a declining trend is still projected in area and/or quality of habitat (see **Threats**).

The significant new survey information for Edwards' Beach Moth from 2014-2019 (see **Range** and Appendix 1) does improve our understanding of its subpopulations. As in COSEWIC (2009), the recent survey data reinforces that the species can be locally abundant within its habitat.

Recent search effort confirmed one subpopulation (#4; not been observed since 1994) (Gatten pers. comm. 2019; see **Range**). Conversely, Wickaninnish (#6) has not been recorded for 18 years, putting its status in question.

Threats:

SAS 16	Change in nature and/or severity of threats:	yes <input type="checkbox"/> no <input checked="" type="checkbox"/> unk <input type="checkbox"/>
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Explanation:

Threats to Edwards' Beach Moth were classified based on the IUCN-CMP (International Union for the Conservation of Nature—Conservation Measures Partnership) unified threats classification system (CMP 2019; Salafsky *et al.* 2008; Master *et al.* 2009). Threats to Edwards' Beach Moth remain consistent with the first COSEWIC (2009) status assessment, provincial recovery strategy (B.C. MOE 2013) and federal recovery strategy (ECCC 2017). The identification of threats (and habitat requirements) is limited by lack of knowledge about its larval host plant; it is unknown but suspected to be one or more species of Saltbush (*Atriplex* spp.), Sand-verbena (*Abronia* spp.), or native Chenopodeaceae (COSEWIC 2009).

Threats are summarized below in order of highest to lowest threat impact and combined for an overall threat impact of medium. The primary threats are the loss and degradation of sandy habitats and the habitat changes from the encroachment of invasive non-native/native species. The endangered Sand-verbena Moth (*Copablepharon fuscum*) is similarly restricted to sand beach and dune habitats and is threatened by these same factors (COSEWIC 2003).

IUCN-CMP Threat 11. Climate change & severe weather. Low impact.

11.1 Habitat shifting & alteration (Unknown impact); 11.2 Droughts (Unknown impact); 11.4 Storms & flooding (Low impact).

The effects of climate change on Edwards' Beach Moth are complex and difficult to predict, but three threat categories (11.1, 11.2 and 11.4) are likely to have an impact in their low-lying coastal habitat: sea-level rise will inundate shoreline, shifting and transforming critical habitat; an increase in summer drought will affect the moth species, its larval host(s) and the sandy substrate they both require; and the increased incidence of severe storms will increase habitat loss and expose individuals to increased predation.

IUCN-CMP Threat 7. Natural system modifications. Low impact.

7.1 Fire & fire suppression (Unknown impact).

Fire is a threat to Edwards' Beach Moth through direct mortality or through death or damage to its host plant(s). Fires are generally infrequent in sandy coastal ecosystems, but several invasive species (e.g., Scotch Broom [*Cytisus scoparius*], Gorse [*Ulex europaeus*]) may increase the fuel load and likelihood. Coastal sand movement is an integral process in creating and sustaining this species' habitat, but it can be disturbed by activities such as construction of breakwaters or groynes (i.e., structures built perpendicular to the shoreline, to prevent erosion).

7.3 Other ecosystem modifications (Low impact).

The gradual encroachment of non-native plants, such as Scotch Broom, Gorse, and European Beach Grass (*Ammophila arenaria*) are causing significant habitat loss and alteration in all the sandy coastal sites of Edwards' Beach Moth. These ecosystem modifications eventually change the habitat within which the moth can survive.

IUCN-CMP Threat 1. Residential & commercial development. Low impact.

1.3 Tourism & recreation areas (Low impact).

Coastal development has historically reduced the quantity and quality of habitat for Edwards' Beach Moth, but it is now rare in the known sites. James Island (# 3) is the sole area that may see future residential development, although the timeline for development is unknown. The three coastal sand ecosystems on the island are protected through conservation covenants, and no recreation, trespassing or other activities are authorized within these areas. However, with increased housing and human population on the island, these and other threats to are likely to increase. Cordova Spit and Island View Beach (# 4) could see development for recreational purposes within its park boundaries (e.g., recreational vehicles, camping and parking facilities). There is increased pressure for development of these facilities, particularly along beachside and oceanfront areas.

IUCN-CMP Threat 6. Human intrusions & disturbance. Low impact.

6.1 Recreational activities (Low impact).

Activities such as walking, pet-walking, camping or all-terrain vehicle use can impact Edwards' Beach Moth by damaging or killing the host plant(s) or altering the sandy substrate they inhabit. The activities permitted at each site vary, but Cordova Shore (# 4), Sidney Island (# 5), and Wickaninnish Beach (# 6) are particularly susceptible.

Protection:

SAS 17	Change in effective protection:	yes <input checked="" type="checkbox"/> no <input type="checkbox"/> unk <input type="checkbox"/>
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Explanation:

Edwards' Beach Moth is listed as Endangered under the federal *Species at Risk Act* (SARA; date of listing: February 4, 2011) and critical habitat has been identified and legally protected (ECCC 2017). The species is not protected under any provincial (B.C.) acts.

Edwards' Beach Moth is assessed provincially as S1 (critically imperiled) (B.C. CDC 2019), N1 (critically imperiled) in Canada (CESCC 2015, B.C. CDC 2019), and is not ranked globally GNR (NatureServe 2019).

The four extant subpopulations of Edwards' Beach Moth are within protected areas (see **Range**) although there are ongoing threats to the habitat within these areas (see **Threats**). Protection and mitigation measures are in place at these subpopulations and include:

Subpopulation #3 James Island:

This subpopulation is on private land. The habitat is protected by a conservation covenant held by and managed by the Nature Conservancy of Canada, at three sand ecosystem areas on this private island. James Island is also managed under the Regional Conservation Plan of the Islands Trust Conservancy (ITC) (2018).

Subpopulation #4 Cordova Spit and Island View Beach:

This site spans three landowners (Tsawout First Nation, Municipality of Central Saanich, Capital Regional District). Cordova Shore is protected by joint ecosystem management planning by all three landowners (Cordova Shore Conservation Partnership Working Group 2010).

Subpopulation #5 Sidney and Hook Spits, Sidney Island:

This site is within Gulf Islands National Park Reserve (federal); the species is protected by the *Canada National Parks Act* and SARA.

Subpopulation #6 Wickaninnish Beach:

This site is within Pacific Rim National Park Reserve (federal) and protected by the *Canada National Parks Act* and SARA.

Rescue Effect:

SAS 18	Change in evidence of rescue effect:	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
Explanation:		
<p>Unknown. The closest United States population of Edwards' Beach Moth to those in Canada would be Henry Island, Washington State. The distance is approximately 12 km over open water from the southern Georgia Strait sites (# 3 James Island, # 4 Cordova Shore; and # 5 Sidney Island). Rescue through dispersal of moths from Henry Island is possible in the long term (COSEWIC 2009). There is, however, no evidence that this has occurred over the last decade.</p> <p>The dispersal ability of Edwards' Beach Moth has not been studied, but information to allow estimation was provided by COSEWIC (2009) and ECCC (2017). Based on characteristics (e.g., average body size, strong fliers, good dispersers; Figure 3) and studies (e.g., Nieminen 1996) of other noctuid moths, a 750 m dispersal estimate was presented (ECCC 2017). Following this estimate, regional dispersal between the small, isolated sites (>10 km), particularly over open ocean, is considered unlikely.</p>		

Quantitative Analysis:

SAS 19	Change in estimated probability of extirpation:	yes <input type="checkbox"/> no <input checked="" type="checkbox"/> unk <input type="checkbox"/>
Details: Not applicable. None undertaken due to lack of data.		

Summary and Additional Considerations

Recovery planning:

A provincial (B.C.) recovery strategy for Edwards' Beach Moth (B.C. MOE 2013) outlined the following recovery objectives: 1) To secure protection for the known sites (and new sites) and habitats of Edwards' Beach Moth; 2) To assess and mitigate the extent of current threats to Edwards' Beach Moth at all sites in B.C.; and 3) To address knowledge gaps (e.g., habitat requirements, host plant use, range in B.C., dispersal abilities) for Edwards' Beach Moth. A federal recovery strategy for Edwards' Beach Moth in Canada, including critical habitat designation, was also completed (ECCC 2017). For B.C. coastal sand ecosystems, a status report was assembled by Page *et al.* (2011).

Restoration and conservation of habitat:

On James Island (# 3), three coastal sand ecosystem habitats on the west, north and northeast parts of the island are protected by conservation covenants established by the Nature Conservancy of Canada (COSEWIC 2009; Page *et al.* 2011) and is managed under the Regional Conservation Plan of the ITC (2018). Work to remove Scotch Broom and Gorse within sand ecosystem habitats on James Island occurred until 2016 and further work to manage invasive species will be initiated in 2020 (Hudson pers. comm. 2019).

For the Cordova Shore (# 4), the Cordova Shore Conservation Strategy has been completed by the Cordova Shore Conservation Partnership Working Group (CSCPWG) (2010) for joint ecosystem management by the three landowners.

Multi-species action plans have been completed for Gulf Islands National Park Reserve of Canada (#5)(Parks Canada Agency 2018) and for Pacific Rim National Park Reserve (#6)(Parks Canada Agency 2017). Their implementation includes ongoing efforts to restore sand ecosystem habitats, including invasive plant removal, in both parks (Collyer pers. comm. 2019; Davies pers. comm. 2019; Lawn pers. comm. 2019).



Figure 3. Adult specimen of Edwards' Beach Moth (*Anarta edwardsii*). Photo courtesy of Gary Anweiler (from first COSEWIC 2009).

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The following individuals provided information: Claudia Copley (Royal British Columbia Museum), Mike Collyer (Parks Canada Agency), Lars Crabo (PNW Moths), Morgan Davies (Parks Canada Agency), Jeremy Gatten (LGL Limited Environmental Research Associates), Lea Gelling (B.C. Ministry of Environment and Climate Change Strategy), David Holden (Canadian Food Inspection Agency), Virginia Hudson (Nature Conservancy of Canada), Don Lafontaine (Canadian National Collection of Insects), Pippi Lawn (Parks Canada Agency), Karen Needham (University of British Columbia), Jeremy Tatum (University of Victoria), Chris Schmidt (Canadian National Collection of Insects), Pippa Shepherd (Parks Canada Agency), Jim Troubridge (Canadian National Collection of Insects), Jennifer Heron (B.C. Ministry of Environment and Climate Change Strategy) and Ross Vennesland (Parks Canada Agency). Nick Page and Gary Anweiler wrote the COSEWIC (2009) status report.

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- Jim Troubridge, Hagersville, Ontario - private collection.
- Lars Crabo, Bellingham, Washington - private collection.

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Jeremy deWaard is the Associate Director of Collections at the Centre for Biodiversity Genomics at the University of Guelph. He leads a team of over twenty staff and students, manages a natural history collection of over four million invertebrate specimens, and oversees the acquisition and processing of specimens for DNA barcode analysis. His research focuses on biological inventories, ecosystem monitoring, and the integrative systematics of terrestrial arthropods, particularly macromoths. Jeremy is also a member of the COSEWIC Arthropods Specialist Sub-Committee, an Adjunct Professor and Instructor at the University of Guelph, an Editor for the journals *Molecular Ecology* and *Molecular Ecology Resources*, and a Director of the Entomological Society of Ontario.

TECHNICAL SUMMARY

Anarta edwardsii

Edwards' Beach Moth

Noctuelle d'Edwards

Range of occurrence in Canada: British Columbia

Demographic Information

Generation time	1 year
Is there an inferred continuing decline in number of mature individuals?	Yes, inferred decline based on decline in habitat quality and quantity.
Estimated percent of continuing decline in total number of mature individuals within [5 years or 2 generations].	Unknown.
[Observed, estimated, inferred, or suspected] percent [reduction or increase] in total number of mature individuals over the last [10 years, or 3 generations, whichever is longer up to a maximum of 100 years].	Unknown.
[Projected or suspected] percent [reduction or increase] in total number of mature individuals over the next [10 years, or 3 generations, whichever is longer up to a maximum of 100 years].	Unknown.
[Observed, estimated, inferred, or suspected] percent [reduction or increase] in total number of mature individuals over any period [10 years, or 3 generations, whichever is longer up to a maximum of 100 years], including both the past and the future.	Unknown
Are the causes of the decline a) clearly reversible and b) understood, and c) ceased?	a) no b) in part c) no.
Are there extreme fluctuations in number of mature individuals?	No

Extent and Occupancy Information

Estimated extent of occurrence (EOO)	659 km ²
Index of area of occupancy (IAO)	20 km ² (current) 28 km ² (current & historical)
Is the population "severely fragmented" i.e., is >50% of its total area of occupancy in habitat patches that are (a) smaller than would be required to support a viable population, and (b) separated from other habitat patches by a distance larger than the species can be expected to disperse?	a. Unknown b. Yes
Number of "locations"* (use plausible range to reflect uncertainty if appropriate)?	2, based on the threat of increased flooding, droughts, and storm surges (from climate change).

* See Definitions and Abbreviations on [COSEWIC website](#) and [IUCN](#) (Aug 2019) for more information on this term

Is there an [observed, inferred, or projected] decline in extent of occurrence?	Yes. Inferred decline in habitat quality/ quantity from increased spread of invasive plants and the increase in severity/frequency of storm surges due to climate change.
Is there an [observed, inferred, or projected] decline in index of area of occupancy?	Yes. Inferred decline in habitat quality/ quantity from increased spread of invasive plants and the increase in severity/frequency of storm surges due to climate change.
Is there an [observed, inferred, or projected] decline in number of subpopulations?	Yes. Inferred decline in habitat quality/ quantity from increased spread of invasive plants and the increase in severity/frequency of storm surges due to climate change.
Is there an [observed, inferred, or projected] decline in number of "locations"*?	Yes. Inferred decline in habitat quality/ quantity from increased spread of invasive plants and the increase in severity/frequency of storm surges due to climate change.
Is there an [observed, inferred, or projected] decline in [area, extent and/or quality] of habitat?	Yes. Inferred decline in habitat quality/ quantity from increased spread of invasive plants and the increase in severity/frequency of storm surges due to climate change.
Are there extreme fluctuations in number of subpopulations?	No.
Are there extreme fluctuations in number of "locations"*?	No.
Are there extreme fluctuations in extent of occurrence?	No.
Are there extreme fluctuations in index of area of occupancy?	No.

Number of Mature Individuals (in each subpopulation)

Subpopulations	N Mature Individuals
All subpopulations	Unknown
Total	Unknown.

Quantitative Analysis

Is the probability of extinction in the wild at least [20% within 20 years or 5 generations whichever is longer up to a maximum of 100 years, or 10% within 100 years]?	Not applicable, no data available.
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* See Definitions and Abbreviations on [COSEWIC website](#) and [IUCN](#) (Aug 2019) for more information on this term

Threats (direct, from highest impact to least, as per IUCN Threats Calculator)

Was a threats calculator completed for this species? Yes, low impact (ECCC 2016)

- 11.4 Storms & flooding – Low impact
- 7.3 Other ecosystem modifications – Low impact
- 1.3 Tourism & recreation areas – Low impact
- 6.1 Recreational activities – Low impact

What additional limiting factors are relevant? Habitat specificity

Rescue Effect (immigration from outside Canada)

Status of outside population(s) most likely to provide immigrants to Canada.	Not ranked. The two known subpopulations in Washington State likely have similar threats and trends to Canadian subpopulations.
Is immigration known or possible?	Unknown. Remotely possible from subpopulations in the San Juan Islands, Washington State.
Would immigrants be adapted to survive in Canada?	Yes.
Is there sufficient habitat for immigrants in Canada?	Yes.
Are conditions deteriorating in Canada?+	Yes.
Are conditions for the source (i.e., outside) population deteriorating?+	Likely. The two known subpopulations in Washington State likely have similar threats and trends to Canadian subpopulations.
Is the Canadian population considered to be a sink?+	Unknown.
Is rescue from outside populations likely?	Not likely.

Data Sensitive Species

Is this a data sensitive species?	No.
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Status History;

COSEWIC: Designated Endangered in April 2009. Status re-examined and confirmed in May 2021.

Status and Reasons for Designation:

Status: Endangered	Alpha-numeric codes: B1ab(ii,iii,iv,v)+2ab(ii,iii,iv,v)
Reasons for designation: This handsome, grey moth lives in sparsely vegetated coastal dunes and upper beaches at only six sites on Vancouver Island and adjacent Gulf Islands; two of these subpopulations may be extirpated. The moth's habitats are at risk from increasing vegetation encroachment (by both native and non-native plant species), recreational activities, and loss of sand as a result of increasing frequency, severity and intensity of winter storms, compounded by sea level rise.	

+ See [Table 3](#) (Guidelines for modifying status assessment based on rescue effect)

Applicability of Criteria

Criterion A (Decline in Total Number of Mature Individuals):
Not applicable.

Criterion B (Small Distribution Range and Decline or Fluctuation):
Meets Endangered, B1ab(ii,iii,iv,v)+2ab(ii,iii,iv,v), as both the EOO (659 km²) and IAO (20 km²) values are lower than the thresholds for Endangered. The species may be severely fragmented (a) although there is little evidence to support this criterion. The species is known to exist at two locations based on an increased severity, frequency, and timing of storm surges/flooding to the coastal lowland habitats. There is an observed and/or inferred continuing decline in (ii) index of area of occupancy, (iii) area, extent and/or quality of habitat, (iv) number of locations and subpopulations, and (v) number of mature individuals inferred from decline in habitat quality/quantity. There is no evidence the species experiences extreme fluctuations in population/subpopulation size.

Criterion C (Small and Declining Number of Mature Individuals):
Not applicable.

Criterion D (Very Small or Restricted Population):
Meets Threatened, D2. IAO =20 km² and number of locations is 2 (< or =5) and population is prone to effects of stochastic events (severe storms that can impact a large proportion of habitat) in an uncertain future and is capable of becoming critically endangered or Extirpated within 10 years. D1 is not applicable because the number of mature individuals is unknown.

Criterion E (Quantitative Analysis):
Not applicable, insufficient data.

Appendix 1. Summary of Edwards' Beach Moth records and null survey data for southwestern B.C. from 2001 to 2019. Modified from COSEWIC (2009).

Sample Locality	Sub-population # General Area	Date	Number Captured	Source
Sidney Island	3	23-Jul-01	23	COSEWIC (2009)
Sidney Island		11-Jun-02	11	
Sidney Island		12-Jun-04	1	
Sidney Island		23-Jun-06	4	
Sidney Island		23-Jun-06	1	
Sidney and Hook Spits, Sidney Island	3	18-Jun-14	2	Davies pers. comm. (2019)
Sidney and Hook Spits, Sidney Island		18-Jun-14	58	
Sidney and Hook Spits, Sidney Island		18-Jun-14	19	
Sidney and Hook Spits, Sidney Island		18-Jun-14	4	
Sidney and Hook Spits, Sidney Island		25-Jun-14	0	
Sidney and Hook Spits, Sidney Island		25-Jun-14	0	
Sidney and Hook Spits, Sidney Island		26-Jun-14	1	
Sidney and Hook Spits, Sidney Island		26-Jun-14	0	
Sidney and Hook Spits, Sidney Island		29-Jun-14	1	
Sidney and Hook Spits, Sidney Island		29-Jun-14	6	
Sidney and Hook Spits, Sidney Island		29-Jun-14	0	
Sidney and Hook Spits, Sidney Island		2-Jul-14	17	
Sidney and Hook Spits, Sidney Island		2-Jul-14	8	
Sidney and Hook Spits, Sidney Island		2-Jul-14	0	
Sidney and Hook Spits, Sidney Island		7-Jul-14	3	
Sidney and Hook Spits, Sidney Island		7-Jul-14	2	
Sidney and Hook Spits, Sidney Island		7-Jul-14	1	
Sidney and Hook Spits, Sidney Island		8-Jul-14	3	
Sidney and Hook Spits, Sidney Island		8-Jul-14	12	
Sidney and Hook Spits, Sidney Island		15-Jul-14	7	
Sidney and Hook Spits, Sidney Island		15-Jul-14	3	
Sidney and Hook Spits, Sidney Island		15-Jul-14	0	
Sidney and Hook Spits, Sidney Island		28-Jul-14	0	
Sidney and Hook Spits, Sidney Island		28-Jul-14	0	
Sidney and Hook Spits, Sidney Island		28-Jul-14	0	
Sidney and Hook Spits, Sidney Island		29-May-19	8	
Sidney and Hook Spits, Sidney Island		29-May-19	1	
James Island	3	27-Jun-07	177	COSEWIC (2009)
James Island		27-Jun-07	19	
James Island		27-Jun-07	27	
Cordova Spit and Island View Beach	4	04-Jul-79	# moths collected unknown	Lafontaine pers. comm. (2019)
Cordova Spit and Island View Beach		01-Jul-94	# moths collected unknown	COSEWIC (2009)
Cordova Spit and Island View Beach	4	02-Jul-14	1	Gatten pers. comm. (2019)
Cordova Spit and Island View Beach		21-Jun-15	1	
Cordova Spit and Island View Beach		30-Jun-16	6	
Cordova Spit and Island View Beach		17-Jun-17	0	
Cordova Spit and Island View Beach		19-Jun-17	0	
Cordova Spit and Island View Beach		03-Jul-17	0	
Cordova Spit and Island View Beach		27-May-18	0	
Cordova Spit and Island View Beach		30-May-18	1	
Cordova Spit and Island View Beach		30-Jun-18	0	
Cordova Spit and Island View Beach		12-Jul-19	1	
Wickaninnish Beach, Tofino	6	12-Jun-01	# moths collected unknown	COSEWIC (2009)
Wickaninnish Beach, Tofino	6	2014 (77 trap nights)	0	Collyer pers. comm. (2019)
Wickaninnish Beach, Tofino		2016 (95 trap nights)	0	



COSEWIC HISTORY

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was created in 1977 as a result of a recommendation at the Federal-Provincial Wildlife Conference held in 1976. It arose from the need for a single, official, scientifically sound, national listing of wildlife species at risk. In 1978, COSEWIC designated its first species and produced its first list of Canadian species at risk. Species designated at meetings of the full committee are added to the list. On June 5, 2003, the *Species at Risk Act* (SARA) was proclaimed. SARA establishes COSEWIC as an advisory body ensuring that species will continue to be assessed under a rigorous and independent scientific process.

COSEWIC MANDATE

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses the national status of wild species, subspecies, varieties, or other designatable units that are considered to be at risk in Canada. Designations are made on native species for the following taxonomic groups: mammals, birds, reptiles, amphibians, fishes, arthropods, molluscs, vascular plants, mosses, and lichens.

COSEWIC MEMBERSHIP

COSEWIC comprises members from each provincial and territorial government wildlife agency, four federal entities (Canadian Wildlife Service, Parks Canada Agency, Department of Fisheries and Oceans, and the Federal Biodiversity Information Partnership, chaired by the Canadian Museum of Nature), three non-government science members and the co-chairs of the species specialist subcommittees and the Aboriginal Traditional Knowledge subcommittee. The Committee meets to consider status reports on candidate species.

DEFINITIONS (2021)

Wildlife Species	A species, subspecies, variety, or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and is either native to Canada or has extended its range into Canada without human intervention and has been present in Canada for at least 50 years.
Extinct (X)	A wildlife species that no longer exists.
Extirpated (XT)	A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.
Endangered (E)	A wildlife species facing imminent extirpation or extinction.
Threatened (T)	A wildlife species likely to become endangered if limiting factors are not reversed.
Special Concern (SC)*	A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
Not at Risk (NAR)**	A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.
Data Deficient (DD)***	A category that applies when the available information is insufficient (a) to resolve a species' eligibility for assessment or (b) to permit an assessment of the species' risk of extinction.

* Formerly described as "Vulnerable" from 1990 to 1999, or "Rare" prior to 1990.

** Formerly described as "Not In Any Category", or "No Designation Required."

*** Formerly described as "Indeterminate" from 1994 to 1999 or "ISIBD" (insufficient scientific information on which to base a designation) prior to 1994. Definition of the (DD) category revised in 2006.



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The Canadian Wildlife Service, Environment and Climate Change Canada, provides full administrative and financial support to the COSEWIC Secretariat.