

Environmental variable	Code	Description	Unit	Modification
Disturbance intensity	DISINT	High, medium, low, and very low disturbance intensity	4 semiquantitative categories	None
Vegetation cover	VEGCOV	total cover of all plants	%	None
Bare ground cover	BARGRD	cover of bare substrate	%	None
Rocks cover	ROCKS	cover of exposed rocks and boulders	%	None
E0 vegetation level cover	E0	lichen and moss cover, including sphagnum moss	%	None
E1 vegetation level cover	E1	Cover of all forbs, shrubs and trees shorter than 1 meter	%	None
E2 vegetation level cover	E2	cover of shrubs and trees taller than 1 meter, but shorter than 5 meters	%	None
E3 vegetation level cover	E3	cover of trees taller than 5 meters	%	None
Wetland vegetation cover	WETVEG	Cover of mainly wetland grasses and forbs but also Sphagnum moss	%	None

Heath cover	HEATH	cover by heath (<i>Calluna vulgaris</i>)	%	None
Vaccinium spp. cover	VACCIN	cover of European blueberry (<i>Vaccinium myrtillus</i>) and the lingonberry (<i>Vaccinium vitis-idea</i>)	%	None
Grass cover	GRASS	Grass cover	%	None
Bracken cover	BRACKN	cover of bracken (<i>Pteridium aquilinum</i>)	%	None
Dense vegetation cover	DENVEG	dense vegetation cover as opposed to sparse vegetation cover	%	None
Sparse vegetation cover	SPAVEG	sparse vegetation cover as opposed to dense vegetation cover	%	Removed due to perfect correlation with dense vegetation to make the analysis clearer.
Tree cover	TRECOV	the sum of deciduous trees coniferous trees covers (also includes saplings)	%	None
Deciduous tree cover	DECTRE	deciduous trees cover	%	None
Conifer tree cover	CONTRE	coniferous trees cover	%	None
Dead plant matter cover	DEPLMA	any dead plant material cover	%	None

Category	Trait	Abbreviation	Description	Modification
Mobility and generation cycle traits	Wingspan	WISP	Distance between forewing tips of a mounted specimen (mm)	none
	Overwintering stage	OWST	phase of metamorphosis in which the species overwinters: egg, caterpillar, pupa, or adult.	Due to a low representation in the dataset, egg and adult categories were merged
	Voltinism	VOLT	number of generations produced annually (1-2)	none
	Semivoltine		species with one brood in two years	not used due to insufficient representation
	Migrations		migrating species at least once a year	Removed due to insufficient representation.
	Apterous		Species with wingless adult females	Removed due to insufficient representation.
Traits related to flight period	Early spring flight period	EASP	early spring activity of adults (0/1)	None
	Spring flight period	SPRG	During this time adults are actively on the wing (0/1)	None
	Summer flight period		During this time adults are actively on the wing	Removed due to insufficient representation.
	Autumn flight period	AUTM	During this time adults are actively on the wing (0/1)	None

	Winter flight period		During this time adults are actively on the wing (0/1)	Removed due to insufficient representation.
	Flight period length	FPL	number of abovementioned flying periods for all generations combined (1/5)	None
Larval feeding traits	Trophic range	TRRA	larvae feeding specialization: monophages (feeding on <4 genera from a single family or on <3 genera from different families); oligophages; and polyphages (>3 plant families). (1-3)	None
	Host plant form	HPF	life form of a host plant: forbs including ferns (1), grasses (2), shrubs (3), trees (4), non-vascular plants and others (5)	None
	Feeds on leaves	LEAF	larvae selectively eating leaves of the host plant. (0/1)	Turned into two categories. Feeds on leaves or not.
	Feeds on flowers/seeds		larvae selectively eating flowers and or seeds of the host plant.	Removed due to insufficient representation.
	Feeds on stems/roots		larvae selectively eating stems and or roots of the host plant.	Removed due to insufficient representation.

	Larval carnivory		at least partial larvae carnivory	Removed due to insufficient representation.
	Detritivory	DETR	Consumption of dead organic matter. (0/1)	None
Moth defense mechanisms/behavior	Larval sociality		From solitary (1), form small groups at least in one instar (2), or form large groups (3).	Removed due to insufficient representation.
	Hairy larvae	HAIR	Extent of hair cover on larvae (0/1)	None
	Aposematic larvae		Larvae with cryptic coloration (1) or aposematic coloration (2).	Removed due to insufficient representation.
	Aposematic adults		Adults with cryptic coloration (1), aposematic coloration only on hindwings (2) or aposematic coloration on both forewings and hindwings (3).	Removed due to insufficient representation.
	Sexual dimorphism	SEXD	species with different body size, color patterns, behavior, etc. between males and females (Allen et al. 2011). (0/1)	None
	Seasonal polyphenism		Described season-related differences in physical traits or behaviors (0/1)	Removed due to insufficient representation.

Traits related to adult activity and resource use	Adult feeding		Adults feeding on nectar, honeydew, sap or other food (1), non-feeding adults often with reduced proboscis (2).	Removed due to insufficient representation.
	Adult activity		adults active during the day (1), during the night (2) or both (3)	Removed due to insufficient representation.
Traits related to habitat use	Altitude range	ALTR	the number of different ranges inhabited (lowland, highland and mountain) (3 is maximum) (1/3)	None
	Habitat range	HABR	Number of habitat types inhabited. (1/4)	None
	Mesophilous1	MES1	species preferring moderate environmental conditions and open habitats (0/1)	None
	Mesophilous2	MES2	species preferring moderate environmental conditions and semi-closed habitats (0/1)	None
	Mesophilous3	MES3	species preferring moderate environmental conditions and closed habitats (0/1)	None
	Xerophilous1	XER1	species preferring dry environmental	None

		conditions and open habitats (0/1)	
Xerophilous2	XER2	species preferring dry environmental conditions and semi-closed habitats (0/1)	None
Xerophilous3		species preferring dry environmental conditions and closed habitats	Removed due to insufficient representation.
Hygrophilous1		species preferring wet environmental conditions and open habitats	Removed due to insufficient representation.
Hygrophilous2	HYG2	species preferring wet environmental conditions and semi-closed habitats (0/1)	None
Hygrothermophilous		species preferring wet environmental conditions and warm temperature	Removed due to insufficient representation.
Tyrphophilous		species preferring peatbogs and peatland	Removed due to insufficient representation.
Alpine		species preferring tall mountain ranges and mountain peaks	Removed due to insufficient representation.
Ubiquitous		species inhabiting habitats with wide range of environmental conditions	Removed due to insufficient representation.

	Habitat 3D structure	TDST	vertical complexity across various vegetation layers, calculated as the average of habitat type values (1-3)	None
	Habitat temperature	HATE	the preferred warmth level of habitats for species; higher scores correspond to warmer habitats. (1-3)	None
	Habitat humidity	HAHU	the preferred humidity level of habitats for species; higher scores correspond to more humid habitats. (1-3)	None
	Habitat acidity		the preferred acidity level of habitats for species; higher scores correspond to more acidic habitats.	Removed due to insufficient representation.
Traits related to species range	Range size	AREA	number of regions where the species is found globally; a higher score indicates a broader geographic range (2-4)	None
	Commonness	COMM	Number of known occupied grid squares in Czechia T	None