

Summary of First Visit: San Juan Island National Historical Park Butterfly Survey

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The initial visit of four planned (May 5 - 8, 2003) was accompanied by excellent weather and succeeded in meeting most of the spring objectives. Full details will be provided with the final report, but here are initial, brief summary findings. The first late afternoon was given to exploring pine forests east of the visitor center, south of Cattle Point Road. The first full day was devoted to American Camp and adjacent NRCA (Lighthouse), bluffs, South Beach, Redoubt and grasslands on all sides of it, Jakle's Lagoon and forests/edges on Mount Finlayson. The second full day was spent at English Camp, on the oak meadows, Young Hill, the cultural sites, and the southwest boundary area. The third final day enabled search of the pinelands/glades east of the AC VC and north of Cattle Point Road; targeted re-survey of the Redoubt area and South Beach and slopes between; the northeast boundary area of AC; Fourth of July Beach; and Old Town Lagoon.

A total of 18 species was recorded, with two additional possibles, as follows:

Erynnis propertius, Propertius' duskywing

Several, Young Hill, oak meadows. **Second Island Record**

Hesperia spp., branded skipper (Juba and Oregon recorded in islands)

Possible sighting, top of Young Hill.

Pyrgus ruralis, Two-banded Rural Skipper

Several sites, pine glades, mesic sites below Redoubt, NE comer. **County Record**

Papilio zelicaon, Anise Swallowtail

Several, mostly around Redoubt.

Papilio rutulus/eurymedon, tiger swallowtail (Western or Pale)

One sighted, not netted, top of Young's Hill; species ID ambiguous; not netted.

Pieris rapae, Cabbage White

One at host's house, Cattle Point.

Euchloe ausonides insulanus, Island Marble

NRCA near -Lighthouse, Redoubt and slopes to the south, South Beach, Oldtown Lagoon, trailhead for Jakle's Lagoon: at least 100 individuals sighted.

Anthocharis sara, Sara's Orangetip

One male, English Camp nr. Officers'Quarters.

Incisalia mossii, Moss's Elfin

One male netted, another sighted, summit of Young Hill around Sedum spathulifolium stands. **Second County Record, Island Record**

Incisalia eryphon, Pine Elfin

One sighted nectarine on Malus, one more seen, pines/glades NE of American Camp entrance. **Island Record**

Everes amyntula, Western Tailed Blue

Abundant at South Beach on Vicia sativa, Lathyrus japonica. Island Record

Celastrina (argiolus) echo, Spring Azure (=Echo Blue)

Many sites, especially wooded edges on Young's/Finlayson hills; all populations associated with Holodiscus discolor, Ocean Spray, as probable host.

Glaucopsyche lygdamus, Silvery Blue

Pines near entrance on vetch, bluffs near lighthouse on perennial lupines, Jakle's Lagoon trailhead on vetch and/or annual lupines. **Second County Record**

Phyciodes mylitta, Mylitta Crescent

Several sites at both AC and EC, most common on slope S of Redoubt.

Polygonia satyrus, Satyr Anglewing

One on willows over nettles in steep cove due south of Redoubt; another at Cattle Point; and another in the nettlebed at South Beach.

Polygonia faunus, Faun anglewing = Green Comma

One seen by cemetery at EC, another at EC parking lot.

Polygonia oreas, Oreas Anglewing

One probable individual seen atop Young Hill, not netted.

Nymphalis antiopa, Mourning Cloak

One individual seen in same *Salix scouleriana* grove noted above for *P. satyrus*.

Nymphalis (Aglais) milberti, Milbert's Tortoiseshell

One on headlands near lighthouse, one south of Redoubt.

Coenonympha tullia insulana, Island Ochre Ringlet

Common but patchy on grassland slopes south and east of Redoubt, NE pine glades of AC.

This total represents approximately half of the species of butterflies so far recorded in the San Juan Islands. The three most notable finds were *Pyrgus ruralis*, the first record of its genus for the San Juan Islands; *Glaucopsyche lygdamus*, second county record; and *Incisalia mossii*, first record for the county since 1950. Both elfins and the Tailed Blue are new for San Juan Island, and several others have few records heretofore.

Numerous nectar sources and probable larval host plants were recorded. Exotics, such as *Myosotis discolor* and *Vicia sativa*, provided many of the nectar visits, as did natives such as *Camas* and *Amsinkia*. *Celastrina echo* was seemingly associated solely with Ocean Spray, and *Pyrgus ruralis* with both strawberry (*Fragaria*, a known host) and dewberry (*Rubus ursinus*), which would be new if confirmed as a larval host.

Euchloe ausonides insulanus, the Island Marble, was numerous from the Redoubt south to the bluffs on the Straits, particularly mid-slope and again in sheltered coves along the bluffs from South Beach westerly. All concentrations were found in proximity with dense or dispersed stands of Common Rape (*Brassica nigra*). While modest amounts of a cress and a Cardamine (both collected for positive ID) were noted in the same district, no attention seemed to be paid these crucifers by the marbles, whereas they nectared on and frequented both Rape and Tumble Mustard (*Sisymbrium altissimum*). Apparent range extensions for the butterfly were made as follows: one male on the grasslands of the DNR NRCA, a few hundred yards west of the Lighthouse; one individual roosting for the night on *Amsinkia* among the tide line driftwood at Old Town Lagoon; and one freshly emerged male going to roost below the Jakle's Lagoon trailhead toward Old Town Lagoon. No crucifers were observed near the Lighthouse; dispersed Rape occurred on the slope between Cattle Point Road and the two latter sightings. Management Considerations. It is premature to make sweeping statements, but the following observations can be given with some confidence.

1) So far it appears that the Island Marble may indeed be chiefly associated with alien Rape, and it would be unwise to undertake management that reduces this plant cover until the biology of the butterfly and its possible hosts have been better studied.

2) The management situation on the American Camp grasslands south and east of the Redoubt is complicated by the disturbance history, the Marble/Rape association, and the intricate admixture of natives such as Camas, Chocolate Lily, and Blue Violet with alien grasses, forbs, and brambles. In particular,

a) In actions taken to reduce Himalayan blackberry (*Rubus discolor*), great care must be taken to avoid disturbing or removing dense stands of the native Dewberry (*Rubus ursinus*), which often grows very nearby but is easily discriminated. The Dewberry is a highly important nectar plant to many butterflies and bumblebees, and seems to be the larval host plant for the newly found checkered skipper (*Pyrgus ruralis*). (Note: this open, mostly xeric habitat seemed a very strange one for *P. ruralis*, which normally occupies moist, woodland-edge situations. But it is using mesic pockets here supporting stands of *R. ursinus*, *Artemisia suksdorfii*, and *Fritillaria lanceolata*. The likely host association of the skipper with Dewberry is new, and perhaps quite rare.)

b) One of the most notable finds was a dense stand of Blue Violet (*Viola adunca*) growing among grasses and forbs on the slope in a line between the large glacial erratics and rock pile east of the Redoubt and South Bay. This violet has the potential for hosting the larvae of two rare species of fritillary butterflies (one of them federally listed) that fly later in the season. This is also an area being invaded, loosely so far, by Himalayan blackberry. So again, the removal of the alien bramble will have to be done with precision and care, so as not to adversely effect the violets -- which were, by the way, the ONLY violets of any species we observed anywhere on San Juan Island the entire week.

c) Where native fescues dominate the grass cover, these areas too should be dealt with carefully. The Island Ochre Ringlet (*Coenonympha tullia insulana*) is not at all widespread, and has a good population here, especially in the vicinity of the erratics. I am not sure to what degree it has adapted to normative grasses as host plants, as have some other subspecies. It appears to be far scarcer where disturbance increases.

3) With respect to the proposed burning at English Camp in the Oak Meadows on and below Young Hill, the conflicts with butterflies and their host plants are apparently not as severe as is often the case in controlled burn situations. The meadows are heavily disturbed, dominated largely by alien invaders. There seems to be little native fescue or scrophulariaceous plant cover that would be concerns, and we found no prairie butterfly species of concern with the exception of the Propertius Skipper, a Garry Oak obligate.

Marah is one of the main natives, along with patchy camas, chocolate lily, and a few others. Though a good nectar source, it is quite fire tolerant. Annual lupines, forget-me-nots, and vetch comprise excellent nectar sources, but fire should not harm them. From this visit, my primary concerns for fire managers in the lower meadows would be to avoid any mortality to either Garry Oaks (which are not overly abundant and show little recruitment) or to Western Juniper (still less

common). The former is the required host for the Propertius Duskywing, extremely limited in the islands; and the latter a potential host for the Juniper/Cedar Hairstreak (*Mitoura grynea*), not yet found in the islands.

However, at higher elevations on Young Hill, the mossy/grassy balds support many more native plants, including good stands of saxifrages, shooting star, *Allium*, and *Plectritis*, as well as native grasses. Great care should be taken that fire treatments do not escape uphill to these balds or summit glades, nor to rock faces supporting mats of stonecrop (*Sedum spathulifolium*), the host of the new island discovery, Moss's Elfin.

4) Continuing management of the pinewoods near the American Camp entrance should aim to maintain the open glade network, especially with smaller, protected glades where western buttercup and strawberry thrive and salal has edge exposure. Pacific Crabapple (*Malus diversifolia*) should be protected and encouraged among the pines. Pine Elfin populations will benefit from young, sun-exposed pines and abundant nectar.

5) Since Canada thistle is another management target at both units, you should be aware that this invasive alien serves as a welcome caterpillar host plant for two of the most attractive butterflies in the park, the Mylitta Crescent and the Painted Lady (when it is present, in good immigration years). It is also one of the best butterfly nectar sources for swallowtails and others. These are common butterflies and I would not urge you to abandon thistle control to encourage them; however, if Canada thistle remains at some level, at least it is good to know that it provides substantial ecological service for several butterflies. This is true too of alien vetches, forget-me-nots, and several others.

6) Along the same lines, a word about Stinging Nettle (*Urtica dioica*=*lyallii*). This, of course, is a native, and not usually a management concern. However, since visitors tend to dislike nettle, some park managers eradicate it near facilities or trails. I strongly urge you to maintain and encourage nettle, since it is the sole larval host plant for three of the park's most beautiful and "watchable wildlife" species of butterflies--the Red Admirable, the Satyr Anglewing, and Milbert's Tortoiseshell (two of which were recorded on this visit; the other is an annual immigrant). An excellent situation obtains at South Beach, where a split rail fence separates parking and picnic spots from a large stand of nettles (where we did observe the Satyr Anglewing). This could be emulated elsewhere.

Conclusion. Further visits will reveal several additional species and host/nectar associations, and some additional perspectives on management. The majority of the uncommon specialists being spring-flying butterflies, our findings so far should help to envision management prescriptions likely to protect or enhance their occurrence. Much more specific information species-by-species will accompany the final report. In short, I recommend maintaining all crucifers for now, protecting oaks and junipers, and attacking Himalayan blackberry on a stem-by-stem basis rather than a broadcast herbicide or fire approach that could damage Dewberry, violets, rescues, and other valuable neighbors.

Summary of Second Visit:
San Juan Island National Historical Park Butterfly Survey
R. M. Pyle

The second visit (of four planned) took place from 22 June to 26 June 2003. Rain (unusual at this season) fell in the night of the 22nd and the morning of the 23rd. The rest of the period was sunny, 60s and 70s, with light wind.

Conditions in this rain-shadow zone were of course much drier than during the May visit, with much of the flora having desiccated or gone over. The butterflies, as expected, were reduced in number and diversity from the spring season. Nonetheless, substantial nectar resources remained or began (especially weedy and native composites, brambles, monocots inc. *Allium* and *Brodiaea*, and sand verbena; ringlets were recorded nectaring on eight plants).

Certain species had appeared or come into their full flight, particularly *Vanessa* and *Limenitis* (ladies and admirals). Results with the island marble,

Euchloe ausonides insulana, were fairly dramatic and surprising, including discovery of a new hostplant that seems to be a native species.

The 23rd was spent at Eagle Point, upshore from the Park; in the sand verbena dunes and blowouts above South Beach at American Camp; South Beach; and the grasslands from the Redoubt to the shore and along the shore path westerly, which was rich with nectar (gumweed, spurry) but absent of butterflies. The 24th was devoted to English Camp, a re-ascend of the very dry Young Hill, where a remarkable assemblage of both swallowtails and Lorquin's admiral engaged in mass interaction (up to eight together) in the summit glades; examination of the gardens and meadows of the cultural site, and re-survey of the oak meadow/grasslands along the SW border of English Camp.

On the 25th, survey centered on the Lighthouse lupine stands, a transect of the length of Mt. Finlayson, Fourth of July Beach and horse camp heath, and circumspection of Oldtown Lagoon. And the morning of the 26th was given to a re-examination of the pineries near the American Camp entrance.

A total of 15 species were recorded, with one additional possible, as follows:

***Hesperiidae*, skippers**

Hesperia spp., branded skipper

Again a possible brief sighting at the top of Young Hill, but neither this nor the May "sighting" are reliable.

Papilionidae, swallowtails

Papilio rutulus, western tiger swallowtail

present in forest edge habitats, especially atop Young Hill; apparently ovipositing on bigleaf maple on descent.

Papilio eurymedon, pale tiger swallowtail

present in Ocean spray habitats, especially atop Young's Hill;
one possible hybrid X *P. rutulus* on *Vinca major* at Jakle park-lot.

Pieridae, whites and sulphurs

Pieris rapae, cabbage white

Several at hosts' house, Cattle Point; one larva on sea rocket, Old Town Lagoon.

Euchloe ausonides insulanus, island marble See discussion below

Lycaenidae, gossamer wings

Lycaena helloides, purplish copper

Several at hosts' garden at Cattle Point and numerous on the flats south of South Beach (observed by Amy Lambert), earlier in June;
Worn males encountered in several Rumex-rich American Camp sites, and one fresh female in the British Camp formal garden.

Celastrina echo, spring azure

Spring flight essentially over; one worn female ovipositing on ocean spray atop Young Hill.

Nymphalidae, brush foots

Boloria epithore, western meadow fritillary

Observed twice in hosts' garden at Cattle Point; doubtless occurs in the Jakle Lagoon forest edges as well.

Phyciodes mylitta, mylitta crescent

First generation early finished, one seen on Finlayson trail, another in the pinery glade N off the American Camp entrance road.

Polygonia satyrus, Satyr Anglewing

Tortoiseshell One at hosts' house earlier in June.

Vanessa cardui, painted lady

One worn individual afternoon-basking on rim of Redoubt, another seen in hosts' garden.

Vanessa annabella, west coast lady

One basking at sand verbena south of South Beach approach road.; one more possible in pinery glade N of Cattle Pt. Rd. beyond American Camp entrance.

Vanessa atalanta, red admirable"

One nectarine on Himalaya blackberry at BritCamp parking lot.

Limenitis lorquini, Lorquin's admiral

Oviposition observed on lobe-tips of low ocean spray, Cattle Point. Many others seen along wood-edges and crossing open habitats in nearly all areas of the park. One of the most common of this visit.

Satyrinae, satyrs and ringlets

Coenonympha tullia insulana, Island Ochre Ringlet

Common in most grassland habitats at American Camp; absent from Young Hill but present on Parade Ground and SE border, British Camp. Both worn and fresh individuals present, suggesting overlapping generations. An order of magnitude more of these than all other spp. combined. Samples of these were collected, augmented by specimens from outside the park, for comparison with prior mass

samples from Orcas Island in order to elucidate the integrity of subspecies "*insulana*" relative to mainland populations currently designated "*ampelos*" and "*eunomia*."

With seven additional species seen during this second survey, this brings the total number of species found on the survey to date to 25. The two species of ladies appear to be San Juan Island records. Numerous nectar sources were recorded.

In addition, these prominent diurnal moths were recorded.

Pseudohazis eglanterina, elegant day moth

Individuals seen along Mt. Finlayson, over the Redoubt grasslands (where one of these fast, colorful, large and bulky moths was observed being taken on the wing by an aeshnid dragonfly), and in the SE edge of British Camp, where larvae were found on the first visit on snowberry.

Haemeris diffinis, snowberry clearwing hummingbird moth

Several of these big bee-mimic, diurnal sphinx moths were nectarine on *Scabiosa* in the British Camp formal garden.

Platyprepia virginalis, ranchman's tiger moth

One of these large, handsome tigers, diurnal and generalist, observed at South Beach.

Tyria jacobaeae, cinnabar moth

European, introduced for control of tansy ragwort, this brilliant scarlet diurnal moth is frequently remarked by visitors. Hundreds of the tiger-striped larvae were observed on the fairly sparse ragwort (*Senecio jacobaeae*) near the east end of Mt. Finlayson.

Special notes on *Euchloe ausonides insulanus*, the Island Marble:

We expected the flight of the marbles to be finished. However, we found one fairly fresh female over the sand verbena off the South Beach approach road on the 23rd. No adults were seen near South Beach, the shore bays to the north, or anywhere on the Redoubt grasslands, where they were numerous in May. On the afternoon of the 25th, we surveyed the Old Town Lagoon shore and vicinity where two males had been found roosting during the first visit.

To our surprise, a number of adults were on the wing here, right along the driftwood-tide line. Two of these were netted and released; a fresh female, and a very fresh, just eclosed (soft-winged) male. This suggests three possibilities: a second generation, an extremely attenuated single generation, or an emergence weighted toward the later end at this bay side site, being in the lee and moister, than the Redoubt/South Beach side of American Camp, which is exposed to the straights and drier.

Bivoltinism isn't generally the case with this species in Washington, but the coastal populations in California are known to produce a second generation (fide J.W. Tilden). J. A. Scott lists the species as generally single-brooded, but with two flights (March-April and L May-June) in lowland N. California. The reality here may involve a combination of

these factors, with a stretched-out spring emergence followed by a second flight where conditions permit (overlapping generations, or facultative bivoltinism).

Host plant findings were also interesting, including the discovery of a new (likely native) host for this population and apparently for the species.

Larvae were found as follows:

One 3rd instar (instars are estimated) on *Sisymbrium altissimum* =, sand verbena dunes south of South Beach approach road.

One 2nd, one 4th on *Sis. alt.*, below SW rim of Redoubt.

Several more 3rd, 4th, 5th on *Sis. alt.* along trail to shore from Redoubt, feeding on flowerparts and seedpods.

One 5th on seed pod of Brassica behind the comfort station at South Beach. One 3rd, one 5th on Brassica campestris N of main Redoubt-to-shore trail.

Five larvae, 3rd-5th, on tall peppergrass (*Lepidium virginicum* var. *menziesii*) (det. C. Maxwell; confirmational determination being sought) among driftwood on the shore of Oldtown Lagoon -- this is a new host for *E. ausonides*. Larvae were feeding on silicles (seedpods).

Other plant/marble observations:

1) On the whole, the *Sisymbrium* was much more apparent in June than the *Brassica*; the opposite was true in May. Both are known hosts for *E. ausonides* elsewhere.

2) *Lepidium virginicum* var. *menziesii* is apparently a native plant here, known to occur in beach habitats on Vancouver Island, the Gulf Islands, and the northern Olympic Peninsula. *Lepidium* also appeared on the sand habitats south of the South Beach approach; these were shorter and more compact, perhaps moisture-stressed or a different species. A brief field experiment was conducted in which a captive female was exposed to both this *Lepidium* and *Sisymbrium*; she oviposited on neither before being released. J.A. Scott has recorded the related species *Lepidium densiflorum* var. *bourgeanum* as a known host for *E. ausonides* elsewhere.

3) The other crucifer present among the Oldtown Lagoon shore-drift is sea rocket or beach radish (*Cokile* spp.). Many plants were searched for larvae, but only one cabbage white larva was found. This plant is succulent and halophytic and dramatically extends the available resources for *Pieris rapae* along many Washington shorelines. It should continue to be searched for marble larvae, on both sides of the American Camp/Cattle Point peninsula. The species still needs to be determined; both European (*C. maritima*) and American (*C. edentula*) sea rockets may be introduced to western beaches.

4) Another crucifer collected from the Redoubt area has been identified by C. Maxwell as *Teesdalia nudicaulis*, a European mustard. No larvae were found on this, nor did the

adults pay it any attention. So the known range of the island marble has been extended, as has its flight period, and the known hosts have been increased from two to three species of crucifers. An interesting possibility arises with the detection of this beach crucifer as a host plant. Perhaps the originally discovered population on southern Vancouver Island was not a denizen of the oak meadows after all, as has been supposed; but a resident of the beach, wandering individuals of which were encountered in upland (oak meadow) situations. And if the beach population represents the aboriginal condition on San Juan Island, the upland and headland population of today might have been founded by wanderers from Old Town Lagoon having discovered and colonized introduced mustards. Such a hypothesis would accord with the randomly dispersive habits of the adults, and account for our inability so far to locate native host plants upslope.