

Island Marble Butterfly Survey at American Camp, San Juan Island National Historical Park

2008 Field Survey Summary Report



Amy M. Lambert

College of Forest Resources
Box 354115
University of Washington
Seattle 98195

April 2009

National Park Service Study Number: SAJH-00041
Permit Number SAJH-2008-SCI-0005
Start Date: April 01, 2008

Expiration Date: Apr 01, 2009

2008 Island Marble Butterfly Field Survey Report

The island marble butterfly (*Euchloe ausonides insulanus*) is a native, rare pierid butterfly restricted to San Juan and Lopez Islands, occurring in moderate numbers at American Camp at San Juan Island National Historical Park. Guppy and Shepard (2001) summarize the natural history of the island marble butterfly in the Georgia Basin and Puget Sound. The island marble was presumed extinct (extirpated from Georgia Basin) when an extant population was discovered at American Camp in 1998 by John Fleckenstein (Fleckenstein 1999). Surveys for additional populations of island marble butterflies in the San Juan Islands and adjacent mainland have been conducted by Washington Department of Natural Resources, Natural Heritage Program (1999, 2000 and 2006) and Department of Fish and Wildlife (2005 and 2007, 2008). Additional documents summarizing butterfly surveys conducted at American Camp include reports submitted to the National Park Service by Robert Michael Pyle (2003), Amy Lambert (2005, 2006 and 2007) and Merrill Peterson (2008). Thesis manuscript by James Miskelly (2000) also includes summary information regarding butterfly surveys from 1998-2000.

This report summarizes the results of field surveys conducted at American Camp during the 2008 field season and is part of my doctoral research on the ecology and conservation of the island marble butterfly. The focus on my research in 2008 was to conduct the fifth and final year of relative adult abundance surveys and to acquire as many opportunities as possible to conduct adult dispersal surveys. Comprehensive egg and larvae studies were concluded in 2007 (see 2007 Island Marble Butterfly Field Survey Report for summary information) and were not a focus on my research in 2008.

Relative Adult Abundance Surveys

Adult surveys follow methods outlined by Pollard and Yates (1993). The set transect survey technique is based on Pollard's observational, low-impact method (Pollard 1977). Sixteen belt transects (200m x 30m wide) were established in island marble habitat across American Camp in 2004 and have been used to conduct surveys in 2005, 2006 and 2007 (Figure 1). Following Pollard and Yates methods, the number of butterflies observed while walking each transect at a consistent pace (200 m in 10 minutes) is recorded during optimal flight conditions (>14° C, <12 mph wind speed and relatively low percent cloud cover). The number of butterflies observed on transects is recorded every 6-9 days (the estimated lifespan of an adult) over the course of the flight season (April-June). Butterfly numbers are then estimated to create an index. The index is a measure of presence/absence of island marble butterflies occurring in different habitats at American Camp. The method is also an index to trends in population over time.

The trend in island marble numbers since 2004 is shown in Figure 2. In 2008, 63 adults were counted on transects in American Camp compared to 71 in 2007 and 125 in 2006. Preliminary analysis suggests a downward trend in numbers since 2004. Prior to 2008, a downward trend in peak abundance was also reported (Figure 3). For example, a 50% decrease in numbers of adults at peak abundance was reported in 2007 (15 adults were

reported on May 18, 2007 compared to 32 adults observed on May 10, 2006). However, an increase in peak abundance was reported in 2008. Twenty-three adults were reported on May 24, 2008 compared to 15 adults on May 18, 2007.

The adult flight season was the shortest flight season recorded over the course of five years of monitoring adults at American Camp (36 days) (Figure 3). Adults were first observed on transects on May 16th and last observed on transects on June 20th (Figure 3). Although the first observation of an adult on transects did not occur until May 16th, an adult was observed off-transect at the redoubt in American Camp on April 25th by James Miskelly and Thor Hanson (2008 pers. comm.) The earliest sighting of an adult in 2008 however, was reported by Merrill Peterson. Two adults were netted and marked for mark-recapture study at the quarry on San Juan Island (2008 pers.comm.). This suggests that the timing of emergence of adults is variable and depends on the location of the population.

Adult Dispersal Surveys

Adult dispersal surveys were based on observational techniques outlined by Turchin et al. (1991) and Dover (1989). Due to the low numbers of adults present at American Camp in 2008, surveys were limited to two sites. Sites were based on the location of observed adults and host plant habitat characteristics. Sites included grassland dominated by *Brassica campestris* and sand dune habitat dominated by *Sisymbrium altissimum*. A total of 9 surveys were conducted from May 22 – June 8, 2008.

Butterfly movements will be used to determine the distance and direction of adults dispersing within host plant patches. Data is currently being analyzed and the results are not available at this time. However, a comprehensive analysis of dispersal surveys will be included in my doctoral dissertation.

In conclusion, this report summarizes results from field surveys conducted in 2008. A complete analysis and comprehensive discussion of my research (including results from surveys conducted from 2004-2008) will be published in my PhD dissertation. Projected completion of my research is December 2009.

References

Carey, J.R. (1993) *Applied Demography for Biologists with Special Emphasis on Insects*. Oxford University Press.

Dover, J.W. (1989) A Method for Recording and Transcribing Observations of Butterfly Behaviour, *Entomologist's Gazette* V 40: 95-100

Fleckenstein, John W. (1999) 1997, 1998 Project Summary Puget Prairie Butterfly Surveys. Department of Natural Resources, Natural Heritage Program. unpublished report

Guppy, C. S. & J. H. Shepard (2001) *Butterflies of British Columbia*. University of British Columbia Press.

Lambert, A.M. (2005) Population Study of the Island Marble Butterfly (*Euchloe ausonides insulanus*), Report of Survey Conducted March – July 2005. Unpublished Report.

Miskelly, James (2000) Habitat requirements and conservation of the butterflies *Euchloe ausonides insulanus* (Pieridae) and *Euphydryas editha taylori* (Nymphalidae) in southwestern British Columbia. MS Thesis, University of Victoria.

Miskelly, James (2005) Surveys for Island Marble Butterfly (*Euchloe ausonides insulanus*) in northern coastal Washington. Department of Fish and Wildlife.

Miskelly J. & J. Fleckenstein (2007) Surveys for Island marble butterfly (*Euchloe ausonides insulanus*) in San Juan County, Washington, 2006. Washington Department of Natural Resources. Prepared for US Fish and Wildlife Service.

Miskelly J. & A.Potter (2007) Surveys for Island marble butterfly (*Euchloe ausonides insulanus*) in San Juan County, Washington, 2007. Department of Fish and Wildlife.

Parker, F.D. (1970) Seasonal mortality and survival of *Pieris rapae* (Lepidoptera: Pieridae) in Missouri and the effect of introducing an egg parasite, *Trichogramma evanescens*. *Annals of the Entomological Society of America* 63:985-994.

Pollard, E. and T.J. Yates (1993) *Monitoring Butterflies for Ecology and Conservation*, Chapman Hall, London

Pyle, R.M. (2003) *The Butterflies of San Juan National Historical Park*, Final Report of a Survey Conduct May-September 2003. Unpublished Report.

Turchin, P., F.J. Odendaal and M.D. Rauscher (1991) Quantifying Insect Movement in the Field. *Environmental Entomology* 20:955-963.

Vernon, Susan (2007) Personal communication

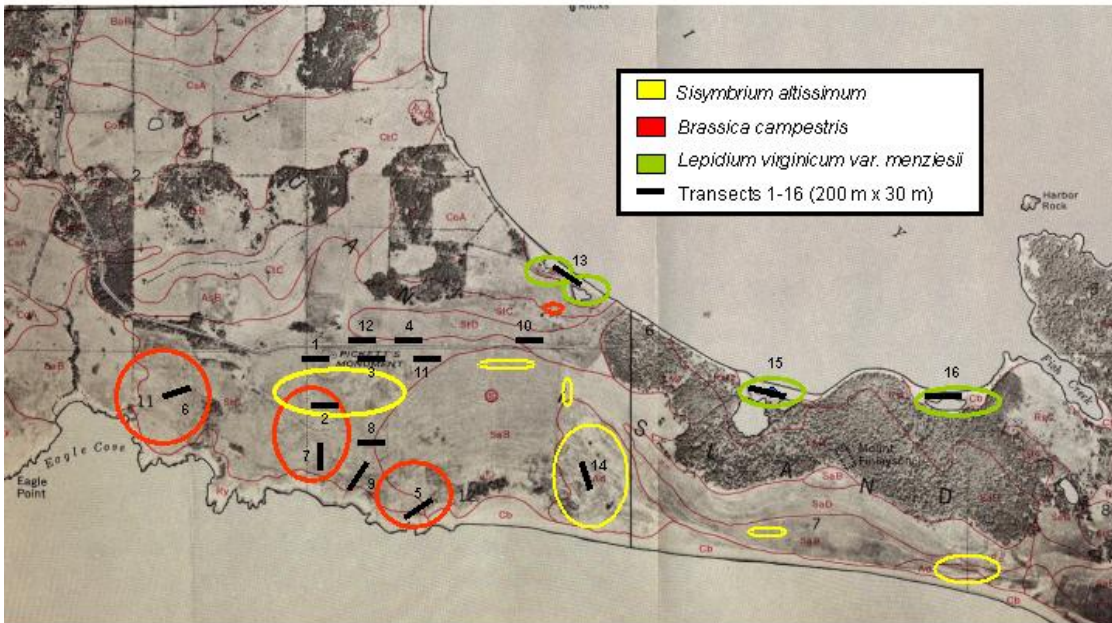


Figure 1. Location of adult transects (1-16) and the occurrence of host plant populations at American Camp.

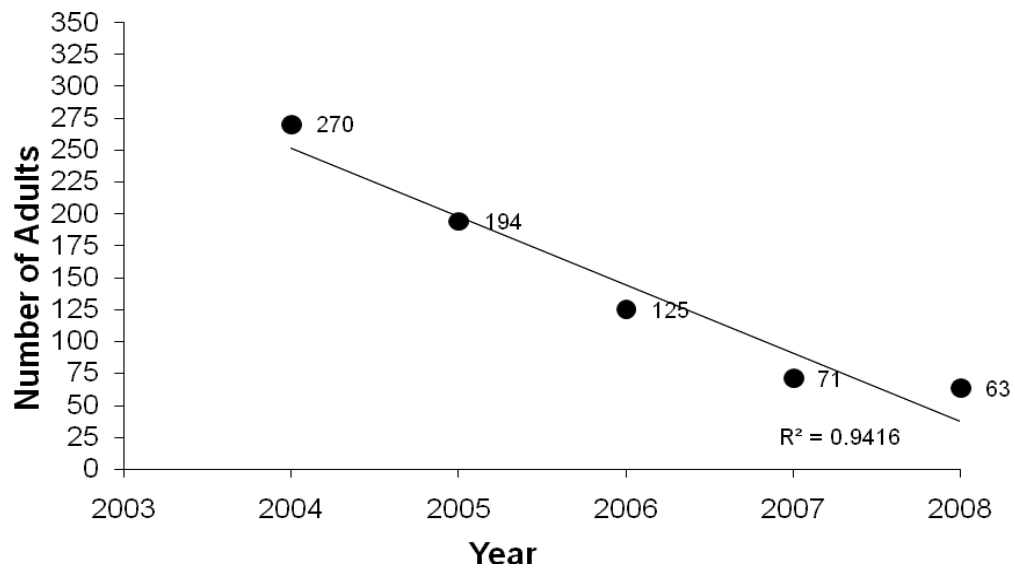


Figure 2. Preliminary analysis of relative adult abundance, 2004-2008. Points correspond to the total number of adults observed on transects.

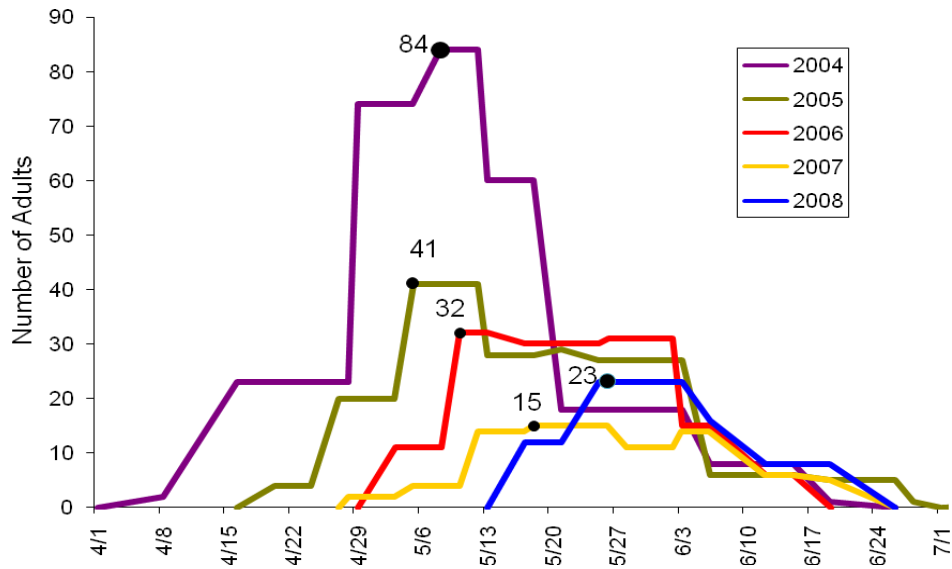


Figure 3. Trends in adult phenology and abundance, 2004-2008. Points on abundance curves indicate the number of adults observed on transects during the peak of the flight season for each corresponding year.