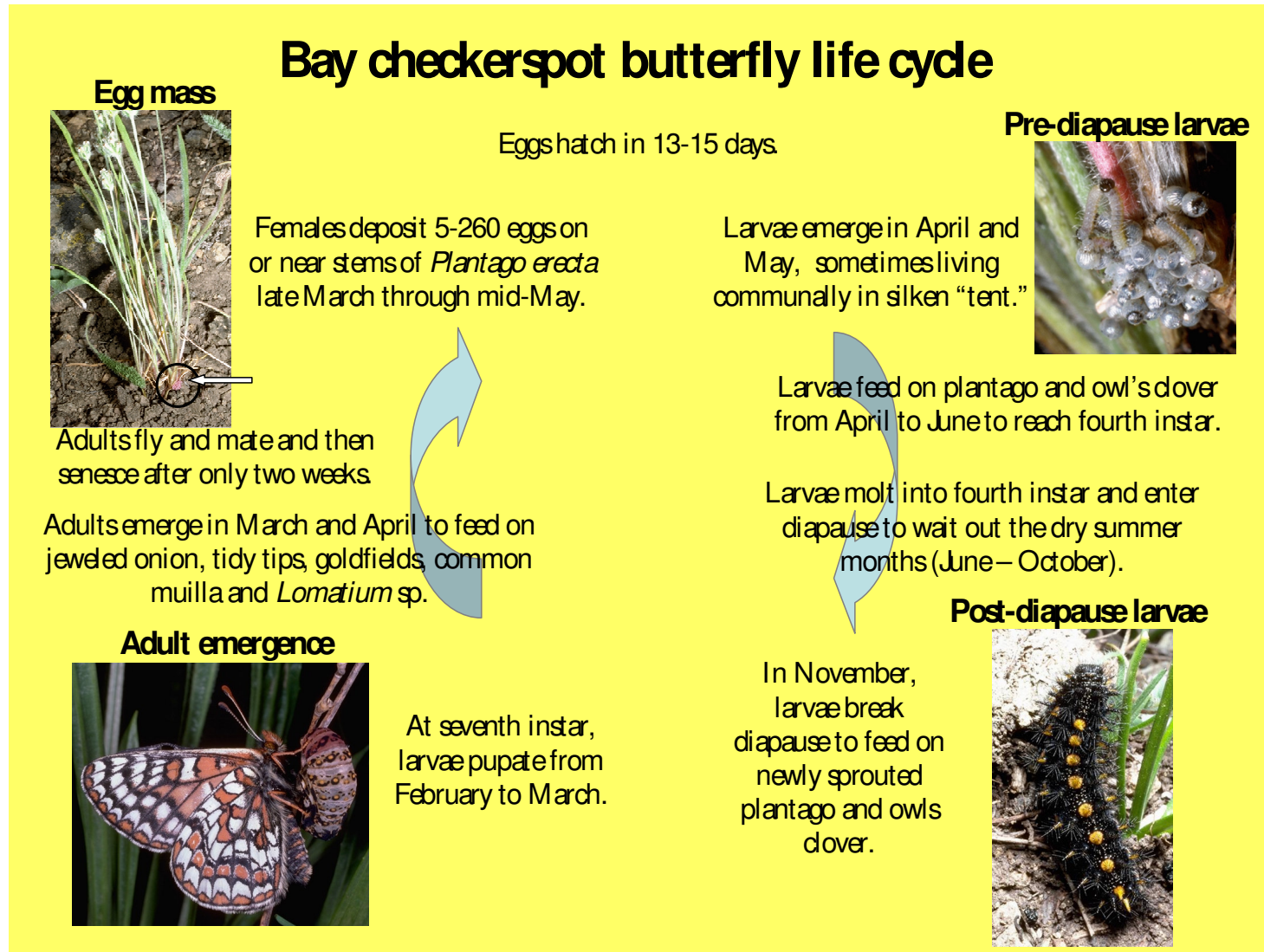


APPENDIX II: BAY CHECKERSPOT BUTTERFLY LIFE CYCLE



Bay checkerspot natural history

On the wings of checkerspots: A model system for population biology (chapters 2 and 3)

Taxonomy and specialized morphology

- ◆ Genus found throughout the world, but the sub-species only found in Santa Clara County and, once again, in San Mateo County
- ◆ Family Nymphalidae (characteristic is greatly reduced forelegs)
- ◆ Reduced forelegs for host plant selection (to sense where to deposit eggs)
- ◆ Large genital claspers
- ◆ Larvae are good solar collectors because of color, setae or bristles (extends boundary layers), and basking behavior

Life History

- ◆ Males emerge first from chrysalis
- ◆ Adults fly March-April, live only a couple of weeks (maybe)
- ◆ Drink nectar from tidy tips, goldfields, common muilla, jeweled onion and *Lomatium*
- ◆ Lay eggs in clusters, 20-350 eggs
- ◆ Males create wax that plugs up female after insemination
- ◆ Eggs hatch in 13-15 days living communally in silken web
- ◆ Owl's clover tends to senesce later in the season, which is beneficial to pre-diapause larvae, but it is less abundant than plantago
- ◆ Race to reach fourth instar before host plant senesce
- ◆ 1st and 2nd instar can not enter diapause
- ◆ 99% mortality in pre-diapause larvae is common
- ◆ When host plant germinates, they break diapause
- ◆ Can re-enter diapause if conditions are not right
- ◆ Post-diapause larvae feed to maturity as solitary individuals
- ◆ Post diapause larvae primarily feed on plantago because clover late bloomers
- ◆ Larvae form chrysalis at seventh instar

Ecology

- ◆ Larvae can disperse 10 meters a day
- ◆ The bulk of larvae survive on cooler slopes as host plants senesce later in the season
- ◆ Larval development is quicker on warmer slopes because it speeds up metabolism
- ◆ In a very cool season, warmer slopes are important in allowing larvae sufficient sunlight to reach diapause
- ◆ Best habitat has topographic heterogeneity on a scale of 10's of meters, allowing larvae to balance need for long-lived host plants and speedy development.
- ◆ Host plants contain secondary chemicals called iridoid glycosides (makes adults sufficiently distasteful to predators) so tend not to be eaten by birds, orange spots maybe aposematic (warning coloration)
- ◆ Gopher tilled soils tend to support large, long-lived, deeply rooted plantago providing favorable circumstances for larvae survival and growth
- ◆ Wasp and several fly species parasitize, eating organs selectively to keep larvae alive as long as possible