pennsylvania
DEPARTMENT OF MILITARY AND VETERANS AFFAIRS

FACT SHEET

Regal Fritillary Butterfly
at Fort Indiantown Gap (FIG) National Guard Training Center

- The Regal Fritillary (*Speyeria idalia*) is a large, orange, and black butterfly that was once found commonly throughout the Northeast. It looks like a "Monarch Butterfly dipped in chocolate."
- Grassland destruction/alteration over the past 30 years has reduced its range and abundance.
- This is the largest population of this species remaining east of Indiana, a second population occurs at Radford Army Ammunition Plant in Virginia. It is also the largest documented population on a single landholding in North America.
- 219 acres of Training Areas and Ranges have been set aside at FIG to conduct research on Regal habitat. In addition over 75 acres of dispersal corridor (among research areas) has been created. All regal-occupied habitat is on an active or inactive military range. Regals LOVE Ranges!!!
- Habitat is created and maintained by repeated, frequent soil disturbance, patchy fires, and stewardship efforts that create a diverse grassland dominated by native herbaceous vegetation.
- Population is around 1,000 adults and has been secure since monitoring started in 1998.
- Survival and persistence in an area depends on three main habitat components:
    - Larval host plants – at least 5,000 violets per acre
    - Adult nectar sources – approximately 150 blooming milkweeds and thistles per acre
    - Native warm season bunch grasses – little bluestem (*Schizachyrium scoparium*) and broomsedge (*Andropogon virginicus*) in the order of 30-75% of vegetation cover
- Larval host plants – field violets that thrive in dry, grassy areas:
    - The main violet species utilized as food is the arrow-leaved violet (*Viola sagittata*)
    - This violet species grows best on bare, low nutrient soils that exist at FIG due to light military training activities and both wildland and prescribed fires
    - Research demonstrated that violets increase 4-fold after tracked military vehicle activity and 8x after a fire for about 3-5 years after the disturbance
- Adult nectar plant survival and abundance is also dependent on periodic disturbances as they are pioneer species adapted (wind dispersed fluffy seeds) to colonizing early-successional habitat.
    - Common milkweed (*Asclepias syriaca*) and orange/butterfly milkweed (*A. tuberosa*)
    - Native thistles: pasture thistle (*Cirsium pumilum*) and field thistle (*C. discolor*)
    - Others include swamp milkweed, swamp thistle, wild bergamot, dogbane, Indian hemp, non-native thistles (Canada, musk/nodding, and bull), and exotic spotted knapweed

- Native Warm Season Grasses (grow best during hot, humid summer weather):
    - Little bluestem and broomsedge grasses dominate typical habitat
    - FIG is the best example of warm season grass in PA in respect with quality (PA-ecotype) and quantity. Regals use native bunch grasses for protection in all stages of the life cycle.
- Current research and monitoring efforts:
    - Pollard Walk technique – survey routes walked every week during summer to assess abundance and distribution of adults for population comparison among years
    - Larval, pupal, and violet herbivory surveys – visual surveys for presence and occurrence
    - Presence/Absence surveys – time-dependent searches for colonization monitoring
    - Violet, nectar plant, and warm season grass abundance surveys – habitat and ecological monitoring to aid stewardship and land management activities
    - Mark/Recapture (MR) surveys – researchers mark wings to perform population census
    - Repatriation ("reintroduction") project at Gettysburg National Military Park and selected PA State Parks funded by Legacy Program (Department of Defense) and the Wild Resource Conservation Program (PA DCNR)
    - In 2006, PA Chapter of The Nature Conservancy transferred the research and monitoring efforts to Pennsylvania State University.
- Prescribed fire is the planned ignition/burning of vegetation under proper weather conditions in a controlled manner by properly trained and equipped personnel.
    - Prescribed fires at FIG have been used to restore Regal Fritillary habitat since 2004, although training-related and controlled burns has been an important component of the Regal's life history at FIG (Range 23 has a 3-year burn frequency for the last 30 years).
    - Fire decreases the amount of plant leaf litter/mulch and woody vegetation and creates bare soil necessary for the germination of violet, nectar, and native grass seeds; also may reduce pests and disease. Controlled fire is more efficient in reaching these goals than unplanned training incidents and prevents burns during critical points in the life cycle.
        - On occasion, training related fires occur within Regal research areas.
        - Large burns have occurred historically about once per decade based on tree ring data, while small, patchy fires appear to reoccur every 3-5+ years.
    - All of these burns, prescribed or wildland, provide us with the opportunity to perform research and monitoring on the effects of fire on the habitat and wildlife.
- Other land stewardship activities:
    - FIG uses mowing, selective herbicide application, and manual tree & brush removal to supplement fire in slowing native woody plant succession and non-native plant invasion
    - Supplemental plantings of nectar species and violets have been used on FIG.
- Disturbance
    - Preventing disturbance by fire, farming, or military vehicles leads to the natural conversion of grasslands and meadows to shrubland or forest
    - Plant vegetation research plot data suggest that just removing woody vegetation maintains native grass abundance but violet and nectar plant densities decline.

- Regal Fritillary Identification:




Upper left, male Regal Fritillary; lower left, female Regal Fritillary (2 rows white spots on hind wing). Upper right, Regal larva in habitat 3 months after a 2004 spring prescribed burn; lower right, Regal pupa (quite possibly the only one photographed in the wild!).