

Butterflies of Death Valley National Park

Compiled by

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Death Valley National park contains diverse resources spread out on over 3.3 million acres of land within the Mojave Desert and Great Basin Desert region of Southeast California and Southwest Nevada. There have been several previous butterfly inventories and investigations within Death Valley National Park, but there has not yet been a complete and comprehensive systematic butterfly inventory. Such a comprehensive inventory is needed to better assess the diversity of butterflies within the park, as well as their habitats, range, and ecological relationships. Until such a comprehensive understanding of the park's butterfly species is produced, this compilation of species known and recorded within the park may assist the butterfly enthusiast and the raise awareness of one of the many unique aspects comprising Death Valley National Park.

Methodology

The first part of this project involved assembling and verifying previously known butterfly records. This search was confined primarily to park files and objects within the park's collection. Limited material was obtained from computer web searches. No attempts were made to locate Death Valley butterfly specimens within natural history collections in local or regional universities and other collections external to the park. Such a search would likely add additional knowledge of the park's butterfly species. The information from this external search will be contained in subsequent updates of this report. Most of the records referenced within this current compilation were from people known to have sufficient knowledge about butterflies; therefore, there was little need to verify their butterfly identifications. A portion of this butterfly inventory includes species recorded by the author. All the author's butterfly observations and identifications are accompanied by a photographic records/voucher that is maintained by the author with a back-up copy also stored at the park.

While these earlier butterfly observations and reports may not have needed significant verification, much work was needed to update taxonomical information and provide consistency. There have been significant taxonomical changes to many butterfly species over the years, including the species found within the park. For the species and common names on this compilation, I used the Checklist of North American Butterflies Occurring North of Mexico by the North American Butterfly Association (2001). This organization is fairly conservative in the acceptance and recognition of subspecies. In addition, the focus of this checklist is to the species-level, not the subspecies level. There is still much taxonomical debate and disagreement on butterflies at the subspecies level. While there is also debate and disagreements at the species level, there is more consensus than at the subspecies level; therefore, there is more stability to a list when restricted to the species level. Due to many of these reasons, this compilation does not list butterflies to the subspecies level. This does not imply that the author or the National Park Service place a lesser importance or significance of distinct subspecies populations. It is fully recognized that Death Valley National Park contains several distinct endemic subspecies butterfly populations, such as *Satyrium fulginosa obsole* (Sooty Hairstreak), *Papilio indra panamintensis* (Panamint Indra Swallowtail) and *Lycaena xanthoides obsolescens* (Hunter Mountain Great Copper).

As stated before, this butterfly inventory uses a standardized nomenclature. In the interest of standardization, many of the observations listed in the original record needed to be changed. If the butterfly species name was changed, the original nomenclature is listed in brackets following the newer standardized name. For instance, the Sara Orangetip butterfly has at various times been known as *Anthocharis thoosa*, *Anthocharis sara thoosa* and *Anthocharis sara*. The NABA Checklist accepts *Anthocharis sara* as the proper species name for the Sara Orangetip; therefore, this inventory lists the record as:

Anthocharis sara [A. sara thoosa; A. thoosa] **Sara Orangetip**

In this example, *Anthocharis sara* is the accepted standardized species name, while *Anthocharis sara thoosa* and *Anthocharis thoosa* (referred here as “*A. sara thoosa*” and “*A. thoosa*”) are non-standardized species names referenced in earlier reports. Therefore, if people want to know what subspecies these butterflies represent, they can glean some of this information from these name cross-references. In this example, an original author identified this butterfly down to the subspecies level (*A. sara thoosa*). Along a similar vein, original authors identified several subspecies of the Square-spotted Blue butterfly, such as *Euphilotes battoides argocyanea*, *E. b. argocyanea*, *E. b. bernardino*. These have now been lumped together simply as *E. battoides*, along also with *E. baueri* which is no longer recognized by the NABA as a distinct species. An indication of the complication in these nomenclature changes is perhaps best represented by *E. centralis panamintensis*. When this subspecies was first recognized, it was listed as being endemic to Panamint Range. However, the species (*E. centralis*) that this subspecies was attached to is no longer recognized as a distinct species, but instead is now listed as a subspecies of *E. battoides*. If *E. centralis* is no longer a recognized species, but instead is a subspecies itself, this puts into question the various subspecies that were listed under *E. centralis*, such as *E. c. panamintensis*. This current inventory does not answer or address these questions, but instead lists the record as follows:

Euphilotes battoides [*E. b. argocyanea*; *E. b. bernardino*; *E. baueri*; *E. centralis panamintensis*] **Square-spotted Blue**

These technical details may be unimportant to many people reading this paper; they may be more interested in butterflies as just beautiful and fascinating creatures, and therefore may prefer simply the common name. For this and other reasons, the common name, while not listed first, is listed in bold text.

Later in this paper there is a discussion and data indicating the elevation where certain butterfly species have been observed. This elevation data should be considered approximate. The original record may have listed “Tin Mountain,” “Charcoal Kilns,” or “Surprise Canyon.” In these examples, the elevation range from the foot of Tin Mountain to the summit, or from the mouth to the head of Surprise Canyon, may be considerable; however the Charcoal Kiln location is more precise. For consistency, for mountains I used the summit elevation, while I usually used the most logical point near the mid-section for determining the elevation for canyon records. Therefore, an occasional data outlier or anomaly may result. The actual relationships become clearer upon the collection of multiple observation records.

The species names used in the source inventories are cross-referenced after the accepted NABA name- these source names are placed within brackets (e.g. “[*Papilio rudkinii*]”). The common name, in bold text, then follows. The species order follows the convention used in the NABA 2001 list. The observation locations are listed in a generally north-to-south order. . When the author has taken a photo voucher of a species, it is indicated with the asterisks symbol (“**”). A pound symbol (“#”) is placed next to a species name in situations in which a specimen is located in the park’s natural resources collection.



This list should not be considered a complete list of all butterflies within the park, for it is incomplete. This paper will need to be revised and updated regularly. The cut-off date for new observation records within this report is June 14, 2007. Information that comes to the park after this date will be incorporated into future up-dates of this paper. If you know of any additions or corrections, please send them to the park in care of Assistant Chief of Resources Management David A. Ek at 760-786-3258 or David_Ek@nps.gov. Thank you for your interest in the resources of Death Valley National Park.

Great Purple Hairstreak (*Atlides halesus*) in nearby Ash Meadows National Wildlife Refuge. This species, as well as many others, may occur within the park but is waiting for people such as yourself to discover the wonderful variety of butterflies within Death Valley National Park.

Butterflies Observations Within Death Valley National Park in Which Known Records Exists

(Key: # = Voucher specimen within park's collection; * = Voucher photograph by this author)

Class: INSECTA

Order: LEPIDOPTERA

Suborder: DITRYZIA

Superfamily: PAPILIONOIDEA

Family: Papilionidae

Papilioninae

Papilio polyxenes [*P. p. coloro*; *P. rudkin*] **Black Swallowtail**

[Titus Canyon (Pratt, 1997)]

[Emigrant Spring (Pratt, 1997; Brown, 1999)]

[Pyramid Peak (Pratt, 1997)]

[Aguereberry Point (Pratt, 1997; Brown, 1999)]

[Greenwater Valley (Pratt, 1997)]

[Surprise Canyon (Emmel, 1980; Pratt, 1997)]

[Willow Spring- Black Mountains (Pratt, 1997)]

[Virgin Spring Canyon (Pratt, 1997)]

#,* *Papilio indra* [*P. i. panamintensis*; *P. i. martin*] **Indra Swallowtail**

[Last Chance Spring (Pratt, 1997)]

[Hanging Rock Canyon (Pratt, 1997)]

[Tin Mountain (Pratt, 1997)]

[White Top Mountain (Emmel, 1980)]

[Titus Canyon (Emmel, 1980)]

[Wildrose Canyon (Emmel, 1981)]

[Wildrose- Charcoal Kilns (Wells, 1975)]

[Thorndike (Wells, 1975; Pratt, 1997; Brown, 1999)]

[Mahogany Flat (Wells, 1975; Emmel, 1981; Pratt, 1997; Brown 1999)]

[between Mahogany Flat and Rogers Peak (Brown, 1999)]

[Rogers Peak (Wells, 1975; Emmel, 1981; Pratt, 1997)]

[Bennett Peak (Wells, 1975)]

[Telescope Peak (Wells, 1975; Emmel, 1981; Pratt, 1997; Brown 1999; Ek, 2007)]

[Water Canyon (Leuschner, 1975; Emmel, 1981; Pratt, 1997)]

Pieridae

Pierinae

Pontia beckerii **Becker's White**

[unidentified location (Wells, 1975)]

[Willow Spring- Last Chance Range (Emmel, 1997b)]

[Last Chance Spring (Pratt, 1997)]

[Hanging Rock Canyon (Pratt, 1997)]

[Grapevine Canyon (Pratt, 1997; Brown, 1999)]

[Grapevine Peak (Pratt, 1997)]

[Scotty's Castle (Johnson & Saulino, 2005)]

[Tin Mountain (Pratt, 1997)]

[Titus Canyon (Pratt, 1997)]

[Titanothera Canyon (Pratt, 1997)]

[Daylight Pass (Pratt, 1997)]

[Racetrack Road [Pratt, 1997]]

[Cottonwood Canyon (Pratt, 1997; Brown, 1999)]

[South Fork Lemoigne Canyon (Emmel, 1980)]

[Pyramid Peak (Pratt, 1997)]

[Aguereberry Point (Pratt, 1997)]

[Emigrant Spring (Brown, 1999)]

[Wildrose Canyon (Pratt, 1997; Brown, 1999)]

[Mahogany Flat (Brown, 1999)]

- # *Pontia sisymbrii* **Spring White**
 [Last Chance Spring (Pratt, 1997)]
 [Phinney Canyon (Emmel, 1980)]
 [Brier Spring Road (Emmel, 1997a)]
 [Titus Canyon (Emmel, 1980; Pratt, 1997)]
 [White Top Mountain (Emmel, 1980)]
 [Telescope Peak (Pratt, 1997)]
 [Surprise Canyon (Emmel, 1980; Pratt, 1997)]
- #,* *Pontia protodice* **Checkered White**
 [Last Chance Spring (Pratt, 1997)]
 [Hanging Rock Canyon (Pratt, 1997)]
 [Titus Canyon (Pratt, 1997; Brown, 1999; Ek, 2007)]
 [Daylight Pass (Pratt, 1997; Brown, 1999)]
 [Racetrack Road (Pratt, 1997)]
 [Hunter Mountain (Emmel, 1980)]
 [Emigrant Spring (Pratt, 1997)]
 [Pyramid Peak (Pratt, 1997)]
 [Aguereberry Point (Brown, 1999)]
 [Nemo Canyon (Pratt, 1997)]
 [Wildrose Canyon (Brown, 1999)]
 [Thorndike (Pratt, 1997)]
 [Rogers Peak (Pratt, 1997)]
 [Willow Spring- Black Mountains (Pratt, 1997)]
 [Virgin Spring Canyon (Pratt, 1997)]
 [Jubilee Pass (Pratt, 1997; Brown, 1999)]
 [Saratoga Spring (Pratt, 1997; Brown, 1999)]
- # *Pieris rapae* [*Artoegia rapae*] **Cabbage White** (exotic/introduced species)
 [Hunter Mountain (Pratt, 1997)]
 [Panamint Mountains (Collection)]
 [Telescope Peak (Pratt, 1997)]
 [Surprise Canyon (Pratt, 1997)]
- # *Euchloe hyantis* [*E. h. lottii*] **Pearly Marble**
 [unidentified location (Wells, 1975)]
 [Willow Spring- Last Chance Range (Emmel, 1997b)]
 [Phinney Canyon (Emmel, 1980)]
 [White Top Mountain (Emmel, 1980)]
 [Titus Canyon (Pratt, 1997)]
 [Cottonwood Canyon (Pratt, 1997; Brown, 1999)]
 [Hunter Mountain (Emmel, 1980)]
 [Skidoo (Brown, 1999)]
 [Emigrant Spring (Brown, 1999)]
 [Aguereberry Point (Brown, 1999)]
 [Wildrose Canyon (Brown, 1999)]
 [Surprise Canyon (Pratt, 1997)]
 [Willow Spring- Black Mountains (Pratt, 1997)]
 [East entrance near US 58 (Brown, 1999)]
 [Western Grapevine Mountains (Pratt, 1997)]
- # *Anthocharis cethura* **Desert Orangetip**
 [unidentified location (Wells, 1975)]
 [East entrance near US 58 (Brown, 1999)]
 [Daylight Pass (Brown, 1999)]
 [Cottonwood Canyon (Pratt, 1997; Brown, 1999)]
 [Skidoo (Brown, 1999)]
 [Emigrant Spring (Brown, 1999)]
 [Aguereberry Point (Brown, 1999)]
 [Greenwater Valley (Pratt, 1997)]
 [Willow Spring- Black Mountains (Pratt, 1997)]
 [Virgin Spring Canyon (Pratt, 1997)]

Anthocharis sara [*A. sara thoosa*; *A. thoosa*] **Sara Orangetip**
[Titus Canyon (Pratt, 1997)]

Coliadinae

Colias eurytheme **Orange Sulphur**

[unidentified location (Wells, 1975)]
[Last Chance Spring (Pratt, 1997)]
[Scotty's Castle (Johnson & Saulino, 2005)]
[Daylight Pass (Brown, 1999)]
[Racetrack Road (Brown, 1999)]

Orange Sulphur continued

[Hunter Mountain (Pratt, 1997 & 2004)]
[Augereberry Point (Pratt, 1997)]
[Wildrose Canyon (Pratt, 1997)]
[Thorndike (Brown, 1999)]
[Wildrose- Charcoal Kilns (Brown, 1999)]
[between Mahogany Flat and Rogers Peak (Brown, 1999)]
[Rogers Peak (Pratt, 1997; Brown, 1999)]
[between Bennett Peak and Telescope Peak (Brown, 1999)]
[Telescope Peak (Pratt, 1997)]
[Jubilee Pass (Brown, 1999)]

Colias cesonia [*Zerene cesonia*] **California Dogface**
[Virgin Spring Canyon (Pratt, 1997)]

Eurema nicippe [*Abaeis nicippe*] **Sleepy Orange**

[Scotty's Castle (Johnson & Saulino, 2005)]
[Rogers Peak (Pratt, 1997; Brown, 1999)]
[Jubilee Pass (Pratt, 1997; Brown, 1999)]

Nathalis iole **Dainty Sulphur**

[White Top Mountain (Emmel, 1980)]
[Wildrose Canyon (Pratt, 1997)]

Family: Lycaenidae

Lycaeninae

Lycaena arota **Tailed Copper**

* [Hunter Mountain (Pratt, 1997 & 2004; Ek, 2007)]

Lycaena xanthoides [*L. x. obsolescens*] **Great Copper**

[Hunter Mountain (Pratt, 1997 & 2004)]

Theclinae

* *Satyrium behrii* **Behr's Hairstreak**

[Last Chance Spring (Pratt, 1997)]
[Grapevine Peak (Pratt, 1997)]
[Grapevine Canyon (Pratt, 1997)]
[Hunter Mountain (Pratt, 1997 & 2004; Ek, 2007)]

Satyrium fuliginosa [*S. fuliginosum obsolescens*] **Sooty Hairstreak**

[Hunter Mountain (Mattoon & Austin, 1998)]

Satyrium sylvinus [*Satyrium silvinus*] **Sylvan Hairstreak**

[Hunter Mountain (Pratt, 1997 & 2004)]

Satyrium saepium **Hedgerow Hairstreak**

[Hunter Mountain (Pratt, 1997 & 2004)]

Callophrys sheridanii [*Callophrys comstocke*] **Sheridan's Hairstreak**

[unidentified location (Wells, 1975)]
[Hanging Rock Canyon (Pratt, 1997)]
[Titus Canyon (Pratt, 1997)]
[White Top Mountain (Emmel, 1980)]
[Hunter Mountain (Emmel, 1980)]
[Titanothera Canyon (Pratt, 1997)]
[South Lemoigne Canyon (Emmel, 1980)]
[Emigrant Spring (Pratt, 1997)]
[Pyramid Peak (Pratt, 1997)]

- [Aguereberry Point (Pratt, 1997)]
 [Telescope Peak (Pratt, 1997; Brown, 1999)]
 [Surprise Canyon (Pratt, 1997)]
- # *Callophrys fotis* [*C. f. fotis*; *Incisalia fotis fotis*] **Desert Elfin**
 [Hanging Rock Canyon (Pratt, 1997)]
 [Titus Canyon (Pratt, 1997)]
 [White Top Mountain (Emmel, 1980)]
 [Tuber Canyon (Pratt, 1997; Brown, 1999)]
- # *Callophrys eryphon* [*Incisalia eryphon*] **Western Pine Elfin**
 [Wildrose Canyon (Pratt, 1997)]
 [Thorndike (Pratt, 1997)]
 [Tuber Canyon (Pratt, 1997; Brown, 1999)]
 [Water Canyon (Leuschner, 1975; Pratt, 1997)]
- Callophrys spinetorum* [*Mitoura spinetorum*; *Loranthomitoura spinetorum*] **Thicket Hairstreak**
 [Last Chance Spring (Pratt, 1997)]
 [Death Valley NP in NV (Pratt, 1997)]
 [Grapevine Peak (Pratt, 1997)]
 [Hunter Mountain (Pratt, 1997 & 2004)]
 [Wildrose- Charcoal Kilns (Pratt, 1997)]
 [Wildrose Peak (Brown, 1999)]
 [Water Canyon (Pratt, 1997)]
- # *Callophrys gryneus* [*C. g. siva*; *Mitoura siva juniperaria*; *M. s. siva*] **Juniper Hairstreak**
 [Thorndike (Pratt, 1997; Brown, 1999)]
 [Wildrose Canyon (Pratt, 1997)]
 [Wildrose- Charcoal Kilns (Pratt, 1997; Brown, 1999)]
 [Tuber Canyon (Brown, 1999)]
 [Water Canyon (Pratt, 1997)]
 [Surprise Canyon (Emmel, 1980; Pratt, 1997)]
- Strymon melinus* [*S. m. pudicus*] **Gray Hairstreak**
 [Scotty's Castle (Johnson & Saulino, 2005)]
 [Titus Canyon (Brown, 1999)]
 [Hunter Mountain (Pratt, 2004)]
 [Aguereberry Point (Brown, 1999)]
 [Telescope Peak (Pratt, 1997)]
- Polyommatae
- #,* *Brephidium exile* [*Brephidium exilis*] **Western Pygmy-blue**
 [unidentified location (Wells, 1975)]
 [Last Chance Spring (Pratt, 1997)]
 [Big Sand Spring (Emmel, 1997b)]
 [Scotty's Castle (Johnson & Saulino, 2005; Ek, 2007)]
 [Mesquite Spring (Pratt, 1997; Ek, 2007)]
 [Daylight Pass (Brown, 1999)]
 [Titanothere Canyon (Pratt, 1997)]
 [White Top Mountain (Emmel, 1980)]
 [Emigrant Spring (Brown, 1999)]
 [Furnace Creek (Brown, 1999)]
 [Pyramid Peak (Pratt, 1997)]
 [Aguereberry Point (Brown, 1999)]
 [Wildrose Canyon (Pratt, 1997; Brown, 1999)]
 [Thorndike (Pratt, 1997)]
 [Mahogany Flat (Brown, 1999)]
 [Surprise Canyon (Emmel, 1980; Pratt, 1997)]
 [Willow Spring- Black Mountains (Pratt, 1997)]
 [Jubilee Pass (Brown, 1999)]
 [Saratoga Spring (Pratt, 1997; Brown, 1999; Ek 2007)]
- # *Leptotes marina* [*Leptotes marinus*] **Marine Blue**
 [Scotty's Castle (Johnson & Saulino, 2005)]
 [Mesquite Spring (Brown, 1999)]
 [Titus Canyon (Brown, 1999)]
 [Daylight Pass (Brown, 1999)]
 [Hunter Mountain (Pratt, 1997)]
 [Furnace Creek (Pratt, 1997; Brown, 1999)]

- [Aguereberry Point (Pratt, 1997; Brown, 1999)]
 [Wildrose Canyon (Pratt, 1997)]
 [Wildrose- Charcoal Kilns (Pratt, 1997; Brown, 1999)]
 [Thorndike (Pratt, 1997)]
- Marine Blue (Continued)
 [between Mahogany Flat and Rogers Peak (Brown, 1999)]
 [Telescope Peak (Pratt, 1997)]
 [Water Canyon (Pratt, 1997)]
 [Jubilee Pass (Brown, 1999)]
- # *Hemiargus ceraunus* [*H. c. gyas*] **Ceraunus Blue**
 [Jubilee Pass (Pratt, 1997; Brown, 1999)]
- Hemiargus isola* [*Echinargus isola*] **Reakirt's Blue**
 [Scotty's Castle (Johnson & Saulino, 2005)]
 [Hunter Mountain (Pratt, 2004)]
 [Telescope Peak (Pratt, 1997)]
 [Virgin Spring Canyon (Pratt, 1997)]
- # *Everes amyntula* [*Cupido amyntula*] **Western Tailed-blue**
 [Last Chance Spring (Pratt, 1997)]
 [Grapevine Peak (Pratt, 1997)]
 [Brier Spring Road (Emmel, 1997a)]
 [Tin Mountain (Pratt, 1997)]
 [White Top Mountain (Emmel, 1980)]
 [Wildrose Peak (Brown, 1999)]
 [Wildrose Canyon (Pratt, 1997)]
 [Wildrose- Charcoal Kilns (Pratt, 1997)]
 [Thorndike (Pratt, 1997; Brown, 1999)]
 [Mahogany Flat (Brown, 1999)]
 [Telescope Peak (Pratt, 1997)]
- # *Celastrina ladon* [*Celastrina argiolus*; *C. l. cinerea*] **Spring Azure**
 [unidentified location (Wells, 1975)]
 [Wildrose Canyon (Pratt, 1997)]
 [Thorndike (Pratt, 1997; Brown, 1999)]
 [between Mahogany Flat and Rogers Peak (Brown, 1999)]
 [Rogers Peak (Brown, 1999)]
 [Tuber Canyon (Brown, 1999)]
 [Telescope Peak (Pratt, 1997)]
 [Water Canyon (Pratt, 1997)]
 [Surprise Canyon (Emmel, 1980; Pratt, 1997)]
- # *Euphilotes battoides* [*E. b. argocyanea*; *E. b. bernardino*; *E. baueri*; *E. centralis panamintensis*] **Square-spotted Blue**
 [Willow Spring- Last Chance Range (Emmel, 1997b & 1997c)]
 [Dedeckera Canyon (Emmel, 1997b)]
 [Grapevine Canyon (Pratt, 1997; Brown, 1999)]
 [Phinney Canyon (Emmel, 1980 & 1997a)]
 [Brier Spring Road (Emmel, 1997a)]
 [Titus Canyon (Brown, 1999)]
 [Daylight Pass (Brown, 1999)]
 [Racetrack Road (Pratt, 1997)]
 [Hunter Mountain (Emmel, 1980; Pratt, 1997 & 2004)]
 [Aguereberry Point (Pratt, 1997; Brown, 1999)]
 [Wildrose Canyon (Pratt, 1988 & 1997; Brown, 1999)]
 [Wildrose- Charcoal Kilns (Pratt, 1997; Brown, 1999)]
 [Thorndike (Pratt, 1997; Brown, 1999)]
 [Mahogany Flat (Pratt, 1997; Brown, 1999)]
 [Telescope Peak (Pratt, 1997)]
 [Water Canyon (Pratt, 1997)]
 [Manly Peak (Pratt, 1988)]
- Euphilotes enoptes* [*E. ancilla giulliani*; *E. mojave*] **Dotted Blue**
 [Willow Spring- Last Chance Range (Emmel, 1997c)]
 [Last Chance Spring (Pratt, 1988 & 1997)]
 [Grapevine Peak (Pratt, 1997)]
 [Wahguyhe Peak (Pratt, 1988)]
 [Tin Mountain (Pratt, 1997)]

[Hidden Valley (Emmel, 1980)]
[Hunter Mountain (Pratt, 1997)]
[Wildrose Canyon (Pratt, 1997)]
[Wildrose- Charcoal Kilns (Pratt, 1997)]
[Thorndike (Pratt, 1997)]

Philotiella speciosa **Small Blue**

[Hanging Rock Canyon (Pratt, 1997)]
[Grapevine Canyon (Pratt, 1997; Brown, 1999)]
[Phinney Canyon (Emmel, 1997a)]
[White Top Mountain (Emmel, 1980)]
[Emigrant Spring (Brown, 1999)]
[Nemo Canyon (Brown, 1999)]
[Wildrose Canyon (Brown, 1999)]

Glaucopsyche lygdamus [*Glaucopsyche lygcamus*] **Silvery Blue**

[White Top Mountain (Emmel, 1980)]
[Titus Canyon (Pratt, 1997)]
[Titanothera Canyon (Pratt, 1997)]
[Hunter Mountain (Ek, 2007)]
[Pyramid Peak (Pratt, 1997)]
[Wildrose Canyon (Pratt, 1997)]
[Tuber Canyon (Brown, 1999)]
[Wildrose- Charcoal Kilns (Pratt, 1997)]
[Thorndike (Pratt, 1997; Brown 1999)]
[between Mahogany Flat and Rogers Peak (Brown, 1999)]
[Rogers Peak (Pratt, 1997; Brown, 1999)]
[between Bennett Peak and Telescope Peak (Brown, 1999)]
[Telescope Peak (Pratt, 1997)]

#,* *Plebejus icarioides* [*P. i. evius*; *Icaricia icarioides evius*] **Boisduval's Blue**

[unidentified location (Wells, 1975)]
[Hunter Mountain (Pratt, 1997)]
[Wildrose Canyon (Pratt, 1997)]
[Thorndike (Pratt, 1997; Brown 1999)]
[Mahogany Flat (Pratt, 1997; Brown, 1999)]
[between Mahogany Flat and Rogers Peak (Brown, 1999)]
[Rogers Peak (Pratt, 1997; Brown, 1999; Ek, 2007)]
[between Bennett Peak and Telescope Peak (Brown, 1999; Ek, 2007)]
[Telescope Peak (Pratt, 1997; Ek, 2007)]
[Water Canyon (Pratt, 1997)]
[Surprise Canyon (Pratt, 1997)]

Plebejus acmon [*P. a. acmon*; *Icaricia acmon acmon*] **Acmon Blue**

[Last Chance Spring (Pratt, 1997)]
[Scotty's Castle (Johnson & Saulino, 2005)]
[Grapevine Peak (Pratt, 1997)]
[Tin Mountain (Pratt, 1997)]
[Titanothera Canyon (Pratt, 1997)]
[Pyramid Peak (Pratt, 1997)]
[Augereberry Point (Pratt, 1997; Brown, 1999)]
[Wildrose Canyon (Pratt, 1997)]
[Wildrose- Charcoal Kilns (Pratt, 1997)]
[Thorndike (Pratt, 1997)]
[Mahogany Flat (Pratt, 1997)]
[Surprise Canyon (Pratt, 1997)]

#,* *Plebejus lupini* [*Icaricia lupini*] **Lupine Blue**

[Hunter Mountain (Emmel, 1980; Pratt, 1997 & 2004; Ek, 2007)]
[Wildrose Canyon (Pratt, 1997)]
[Wildrose- Charcoal Kilns (Pratt, 1997; Brown, 1999)]
[Thorndike (Pratt, 1997; Brown, 1999)]
[Mahogany Flat (Pratt, 1997; Brown, 1999)]
[between Mahogany Flat and Rogers Peak (Brown, 1999)]

[Telescope Peak (Pratt, 1997)]
[Water Canyon (Leuschner, 1975; Pratt, 1997)]

Family: Riordinidae

Riordininae

Apodemia mormo **Mormon Metalmark**

[Last Chance Range (Pratt, 1997)]
[Eureka Valley Road (Pratt, 1997)]
[Racetrack Road (Pratt, 1997)]
[Hunter Mountain (Emmel, 1980)]
[Titus Canyon (Emmel, 1997a)]
[Wildrose Canyon (Pratt, 1997; Brown, 1999)]
[Wildrose- Charcoal Kilns (Pratt, 1997; Brown, 1999)]
[Thorndike (Pratt, 1997)]
[Virgin Spring Canyon (Pratt, 1997)]
[Salisbury Pass (Pratt, 1997)]
[Jubilee Pass (Pratt, 1997; Brown, 1999)]

Family: Nymphalidae

Nymphalinae

Thessalia leanira [*Chlosyne leanira alma*] **Leanira Checkerspot**

[Willow Spring- Last Chance Range (Emmel, 1997b)]
[Last Chance Spring (Pratt, 1997)]
[Hanging Rock Canyon (Pratt, 1997)]
[Dedeckera Canyon (Emmel, 1997b)]
[Titus Canyon (Pratt, 1997)]
[White Top Mountain (Emmel, 1980)]
[Emigrant Spring (Pratt, 1997)]
[Aguereberry Point (Pratt, 1997; Brown, 1999)]
[Nemo Canyon (Pratt, 1997; Brown, 1999)]
[Wildrose Canyon (Brown, 1999)]
[Surprise Canyon (Pratt, 1997; Emmel, 1980)]
[Willow Spring- Black Mountains (Pratt, 1997)]

Chlosyne palla [*Charidryas palla*; *Melitaea palla*] **Northern Checkerspot**

[unidentified location (Wells, 1975)]
[Tuber Canyon (Johnson, 1938; Emmel & Emmel, 1973; Brown, 1999)]
[between Mahogany Flat and Rogers Peak (Brown, 1999)]
[Rogers Peak (Pratt, 1997; Brown, 1999)]
[Telescope Peak (Pratt, 1997)]
[Water Canyon (Leuschner, 1975)]

Chlosyne acastus [*Charidryas acastus*; *Chlosyne neuvoegeni*; *Charidryas neuvoegeni*] **Sagebrush Checkerspot**

[Hanging Rock Canyon (Pratt, 1997)]
[Dedeckera Canyon (Emmel, 1997b)]
[Scotty's Castle (Wells, 1975)]
[Titus Canyon (Pratt, 1997; Brown, 1999)]
[Titanothera Canyon (Pratt, 1997)]
[White Top Mountain (Emmel, 1980)]
[Daylight Pass (Wells, 1975; Pratt, 1997)]
[Cottonwood Canyon (Pratt, 1997; Brown, 1999)]
[Emigrant Spring (Pratt, 1997; Brown, 1999)]
[Aguereberry Point (Pratt, 1997; Brown, 1999)]
[Nemo Canyon (Brown, 1999)]
[Wildrose Canyon (Wells, 1975; Pratt, 1997; Brown, 1999)]
[Wildrose- Charcoal Kilns (Brown, 1999)]
[Mahogany Flat (Brown, 1999)]
[Rogers Peak (Pratt, 1997)]
[Water Canyon (Pratt, 1997)]
[Surprise Canyon (Pratt, 1997)]
[Willow Spring- Black Mountains (Pratt, 1997)]

- [Virgin Spring Canyon (Pratt, 1997)]
 [Jubilee Pass (Brown, 1999)]
- Phyciodes mylitta* **Mylitta Crescent**
 [Last Chance Spring (Pratt, 1997)]
 [Hunter Mountain (Pratt, 1997)]
- Nymphalis californica* **California Tortoiseshell**
 [Wildrose Canyon (Pratt, 1997)]
 [Thorndike (Pratt, 1997)]
 [between Bennett Peak and Telescope Peak (Brown, 1999)]
 [Telescope Peak (Pratt, 1997)]
 [Water Canyon (Pratt, 1997)]
- * *Nymphalis antiopa* **Mourning Cloak**
 [Willow Spring- Last Chance Range (Emmel & Giuliani, 1996; Pratt, 1997)]
 [Brier Spring Road (Emmel, 1997a)]
 [Hunter Mountain (Pratt, 1997 & 2004; Ek, 2007)]
 [Wildrose Canyon (Pratt, 1997)]
 [Surprise Canyon (Emmel, 1980; Pratt, 1997)]
- Nymphalis milberti* [*Aglais milberti furcillata*] **Milbert's Tortoiseshell**
 [Brier Spring Road (Emmel, 1997a)]
 [Wildrose Canyon (Brown, 1999)]
 [Telescope Peak (Pratt, 1997)]
- * *Vanessa virginiensis* **American Lady**
 [Wildrose Peak (Ek, 2007)]
- #,* *Vanessa cardui* **Painted Lady**
 [Last Chance Spring (Pratt, 1997)]
 [Scotty's Castle (Johnson & Saulino, 2005)]
 [Brier Spring Road (Emmel, 1997a)]
 [Titus Canyon (Pratt, 1997; Brown, 1999)]
 [Titanothera Canyon (Pratt, 1997)]
 [Daylight Pass (Pratt, 1997)]
 [Hunter Mountain (Pratt, 1997 & 2004)]
 [Cow Creek (Ek, 2007)]
 [Lee Flat (Ek, 2007)]
 [Greenwater Valley (Pratt, 1997)]
 [Virgin Spring Canyon (Pratt, 1997)]
 [Jubilee Pass (Brown, 1999)]
- # *Vanessa annabella* **West Coast Lady**
 [Grapevine Peak (Pratt, 1997)]
 [Brier Spring Road (Emmel, 1997a)]
 [Tin Mountain (Pratt, 1997)]
 [Titus Canyon (Pratt, 1997)]
 [Daylight Pass (Brown, 1999)]
 [Furnace Creek (Brown, 1999)]
 [Aguereberry Point (Brown, 1999)]
 [Mahogany Flat (Pratt, 1997; Brown, 1999)]
 [between Bennett Peak and Telescope Peak (Brown, 1999)]
 [Telescope Peak (Pratt, 1997)]
 [Surprise Canyon (Pratt, 1997)]
 [Jubilee Pass Brown, 1999)]
 [Virgin Spring Canyon (Pratt, 1997)]
- # *Vanessa atlanta* **Red Admiral**
 [Brier Spring Road (Emmel, 1997a)]
 [Telescope Peak (Pratt, 1997)]
- * *Junonia coenia* **Common Buckeye**
 [Hunter Mountain (Pratt, 1997)]
 [Devils Hole (Ek, 2007)]
- Limenitidinae
- * *Limenitis lorquini* **Lorquin's Admiral**
 [Hunter Mountain (Pratt, 1997 & 2004; Ek, 2007)]
- Danainae

- #,* *Danaus plexippus* **Monarch**
 [Last Chance Spring (Pratt, 1997)]
 [Grapevine Canyon (Pratt, 1997)]
 [Mesquite Spring (Pratt, 1997; Ek, 2007)]
 [Titus Canyon (Brown, 1999)]

Monarch continued

- [Hidden Valley (Emmel, 1980)]
 [Hunter Mountain (Pratt, 1997 & 2004)]
 [Furnace Creek (Wells, 1975)]
 [Emigrant Spring (Brown, 1999)]
 [Wildrose Canyon (Ek, 2007)]

Danaus gilippus **Queen**

- [Scotty's Castle (Johnson & Saulino, 2005)]
 [Cow Creek (Ek, 2007) {wing found on windowsill}]

Satyrinae

- * *Cercyonis sthenele* **Great Basin Wood-nymph**
 [Cucomungo Canyon (Emmel, 1997d)]
 [Last Chance Spring (Pratt, 1997)]
 [Grapevine Peak (Pratt, 1997)]
 [Hunter Mountain (Pratt, 1997 & 2004; Ek, 2007)]

Superfamily: HESPERIOIDEA

Family: Hesperidae

Pyrginae

- # *Heliopetes ericetorum* **Northern White-skipper**
 [Last Chance Spring (Pratt, 1997)]
 [Grapevine Peak (Pratt, 1997)]
 [Titus Canyon (Pratt, 1997)]
 [Daylight Pass (Pratt, 1997; Brown, 1999)]
 [Racetrack Road (Pratt, 1997)]
 [Hunter Mountain (Pratt, 2004)]
 [Pyramid Peak (Pratt, 1997)]
 [Aguereberry Point (Pratt, 1997; Brown, 1999)]
 [Wildrose Canyon (Pratt, 1997)]
 [Thorndike (Pratt, 1997)]
 [Surprise Canyon (Emmel, 1980; Pratt, 1997)]
- Pyrgus communis* **Common Checkered-skipper**
 [Last Chance Spring (Pratt, 1997)]
 [Scotty's Castle (Johnson & Saulino, 2005)]
 [Grapevine Peak (Pratt, 1997)]
 [Titanothera Canyon (Pratt, 1997)]
 [Hunter Mountain (Ek, 2007)]
 [South Lemoigne Canyon (Emmel, 1980)]
 [Aguereberry Point (Pratt, 1997)]
 [Willow Spring- Black Mountains (Pratt, 1997)]
 [Virgin Spring Canyon (Pratt, 1997)]
- * *Pyrgus scriptura* **Small Checkered-skipper**
 [Eureka Dunes (Ek, 2007)]
- # *Pyrgus albescens* [*Pyrgus communis albescens*] **White Checkered-skipper**
 [Daylight Pass (Brown, 1999)]
 [Hunter Mountain (Pratt, 2004)]
 [Aguereberry Point (Brown, 1999)]
- # *Hesperopsis libya* [*Pholisora libya lena*] **Mojave Sootywing**
 [Mesquite Spring (Brown, 1999)]
 [Racetrack Road (Pratt, 1997)]
 [Salt Creek (Brown, 1999)]
 [Emigrant Spring (Brown, 1999)]
 [Aguereberry Point (Pratt, 1997; Brown, 1999)]
 [Wildrose Canyon (Pratt, 1997; Brown, 1999)]

[Jubilee Pass (Pratt, 1997; Brown, 1999)]

Hesperopsis alpheus [*Pholisora alpheus*] **Saltbush Sootywing**
[Titanothera Canyon (Pratt, 1997)]

Hesperiinae

Copaeodes aurantiaca **Orange Skipperling**
[Pyramid Peak (Pratt, 1997)]
[Willow Spring- Black Mountains (Pratt, 1997)]
[Virgin Spring Canyon (Pratt, 1997)]

* *Hylephila phyleus* **Fiery Skipper**
[Scotty's Castle (Johnson & Saulino, 2005)]
[Furnace Creek (Ek, 2007)]

Hesperia juba **Juba Skipper**
[Hunter Mountain (Emmel, 1980)]
[Surprise Canyon (Emmel, 1980; Pratt, 1997)]

#, * *Hesperia comma* [*H. c. harpalus*] **Common Branded-skipper**
[Last Chance Spring (Pratt, 1997)]
[Grapevine Peak (Pratt, 1997)]
[Tin Mountain (Pratt, 1997)]
[Hunter Mountain (Pratt, 1997 & 2004; Ek, 2007)]
[Aguereberry Point (Pratt, 1997)]
[Wildrose Canyon (Pratt, 1997)]
[between Mahogany Flat and Rogers Peak (Brown, 1999)]
[Rogers Peak (Pratt, 1997)]

* *Atalopedes campestris* **Sachem**
[Hunter Mountain (Emmel, 1980; Ek, 2007)]

* *Ochlodes yuma* **Yuma Skipper**
[Scotty's Castle (Johnson & Saulino, 2005; Ek, 2007)]
[Grapevine Canyon (Pratt, 1997; Ek, 2007)]
[Mesquite Spring (Leuschner, 1975; Pratt, 1997)]
[Hunter Mountain (Ek, 2007)]
[Darwin Falls (Ek, 2007)]
[Surprise Canyon (Pratt, 1997)]

Megathyminae

Megathymus yuccae **Yucca Giant-skipper**
[Willow Spring- Last Chance Range (Emmel, 1997b & 1997c)]
[Tin Mountain (Pratt, 1997)]
[White Top Mountain (Emmel, 1980)]

Summary

Total Species Documented in Park	=	68
Total Specimens in Collection	=	36 (53%)
Total Photo Vouchers	=	19 (28%)
Total Combined Vouchers	=	47 (69%)

Brief Overview of Butterfly Life History

A butterfly proceeds through four distinct phases: the egg, larval caterpillar, pupal/chrysalis phase and lastly the adult butterfly. The timing of these four phases may be completely distinct from species to species. As a consequence, some species of butterflies are known as early-season species, while others are late season flyers. This refers to the timing within the year in which a butterfly is in its adult phase and therefore becomes much more visible in comparison to its earlier phases. The timing of the adult phase of the butterfly is usually closely matched to the timing of the adult butterfly primary nectar food source. A species may not live long if they only feed on one species of flower and the adult butterfly emerges several months after that flower species have all bloomed and died off for the year. The season an adult butterfly is observed and the food it's eating are important clues in butterfly identification. Table 1 lists many of the plant species in which each butterfly species within the park have been known for to utilize as a food source, as well as the number of known plant species within that particular plant group that have been documented within Death Valley National Park. Table 2 summarizes the month of the year that each of these Death Valley National Park sightings occurred.

Table 1

Plant Species within Death Valley NP that Adult Butterfly Feed Upon

Butterfly Species	Food Plant	# plant species
Papilionidae		
Papilioninae		
<i>Papilio polyxenes</i> Black Swallowtail	<i>Thamnosma montana</i>	1
<i>Papilio indra</i> Indra Swallowtail	Apiaceae family	12
Pieridae		
Pierinae		
<i>Pontia beckerii</i> Becker's White	Brassicaceae family	46
<i>Pontia sisymbrii</i> Spring White	Brassicaceae family	46
<i>Pontia protodice</i> Checkered White	Brassicaceae family	46
<i>Pieris rapae</i> Cabbage White	Brassicaceae family	46
<i>Euchloe hyantis</i> Pearly Marble	Brassicaceae family	46
<i>Anthocharis cethura</i> Desert Orangetip	Brassicaceae family	46
<i>Anthocharis sara</i> Sara Orangetip	Brassicaceae family	46
Coliadinae		
<i>Colias eurytheme</i> Orange Sulphur	Fabaceae family	69
<i>Colias cesonia</i> California Dogface	Fabaceae family	69
<i>Eurema nicippe</i> Sleepy Orange	Fabaceae family	69
<i>Nathalis iole</i> Dainty Sulphur	Asteraceae family	169
Lycaenidae		
Lycaeninae		
<i>Lycaena arota</i> Tailed Copper	<i>Ribes hirtellum</i> & <i>R. velutinum</i>	2
<i>Lycaena xanthoides</i> Great Copper	<i>Rumex</i> sp.	2
Theclinae		
<i>Satyrium behrii</i> Behr's Hairstreak	<i>Purshia</i> sp.	2
<i>Satyrium fuliginosa</i> Sooty Hairstreak	<i>Lupinus</i> sp.	14
<i>Satyrium sylvinus</i> Sylvan Hairstreak	<i>Salix</i> sp.	5
<i>Satyrium saepium</i> Hedgerow Hairstreak	<i>Ceanothus</i> sp.	2
<i>Callophrys sheridanii</i> Sheridan's Hairstreak	Polygonaceae family	53
<i>Callophrys fotis</i> Desert Elfin	<i>Purshia</i> sp. and <i>Rosa</i> Sp.	55
<i>Callophrys eryphon</i> Western Pine Elfin	<i>Pinus</i> sp.	3
<i>Callophrys spinetorum</i> Thicket Hairstreak	dwarf mistletoes on conifers	
<i>Callophrys gryneus</i> Juniper Hairstreak	<i>Juniperus</i> sp.	3
<i>Strymon melinus</i> Gray Hairstreak	variety	
Polyommatainae		
<i>Brephidium exile</i> Western Pygmy-blue	<i>Atriplex</i> sp. & <i>Chenopodium</i> sp.	19
<i>Leptotes marina</i> Marine Blue	Fabaceae family	69
<i>Hemiargus ceraunus</i> Ceraunus Blue	Fabaceae family	69
<i>Hemiargus isola</i> Reakirt's Blue	Fabaceae family	69
<i>Everes amyntula</i> Western Tailed-blue	Fabaceae family	69
<i>Celastrina ladon</i> Spring Azure	variety	
<i>Euphilotes battoides</i> Square-spotted Blue	Polygonaceae family	53

<i>Euphilotes enoptes</i> Dotted Blue	Polygonaceae family	53
<i>Philotiella speciosa</i> Small Blue	Polygonaceae family	53
<i>Glaucopsyche lygdamus</i> Silvery Blue	Fabaceae family	69
<i>Plebejus icarioides</i> Boisduval's Blue	<i>Lupinus</i> sp.	14
<i>Plebejus acmon</i> Acmon Blue	Fabaceae family	69
<i>Plebejus lupini</i> Lupine Blue	Polygonaceae family	53
Riodinidae		
Riodininae		
<i>Apodemia mormo</i> Mormon Metalmark	Polygonaceae & Krameriaceae families	55
Nymphalidae		
Nymphalinae		
<i>Thessalia leanira</i> Leanira Checkerspot	<i>Castilleja</i> sp	3
<i>Chlosyne palla</i> Northern Checkerspot	Asteraceae family	169
<i>Chlosyne acastus</i> Sagebrush Checkerspot	<i>Chrysothamnus nauseosus</i> & <i>Xylorhiza tortifolia</i>	2
<i>Phyciodes mylitta</i> Mylitta Crescent	<i>Centaurea</i> , <i>Cirsium</i> , <i>Sonchus</i> , and <i>Salsola</i> sp.	9
<i>Nymphalis californica</i> California Tortoiseshell	<i>Ceanothus integerrimus</i>	1
<i>Nymphalis antiopa</i> Mourning Cloak	<i>Salix</i> sp.	5
<i>Nymphalis milberti</i> Milbert's Tortoiseshell	<i>Stachys</i> sp, <i>Eucnide</i> sp. & <i>Urtica</i> sp.	3
<i>Vanessa virginiensis</i> American Lady	Asteraceae family	169
<i>Vanessa cardui</i> Painted Lady	<i>Stachys</i> sp, <i>Eucnide</i> sp. & <i>Urtica</i> sp.	3
<i>Vanessa annabella</i> West Coast Lady	Malvaceae family	7
<i>Vanessa atlanta</i> Red Admiral	<i>Stachys</i> sp, <i>Eucnide</i> sp. & <i>Urtica</i> sp.	3
<i>Junonia coenia</i> Common Buckeye	Scrophulariaceae family	2
Limenitidinae		
<i>Limenitis lorquini</i> Lorquin's Admiral	Salicaceae family	6
Danainae		
<i>Danaus plexippus</i> Monarch	Asclepiadaceae family	5
<i>Danaus gilippus</i> Queen	Asclepiadaceae family	5
Satyrinae		
<i>Cercyonis sthenele</i> Great Basin Wood-nymph	Poaceae family	77
Hesperidae		
Pyrginae		
<i>Heliopetes ericetorum</i> Northern White-skipper	Malvaceae family	7
<i>Pyrgus communis</i> Common Checkered Skipper	Malvaceae family	7
<i>Pyrgus scriptura</i> Small Checkered-skipper	Malvaceae family	7
<i>Pyrgus albescens</i> White Checkered-skipper	Malvaceae family	7
<i>Hesperopsis libya</i> Mojave Sootywing	Malvaceae family	7
<i>Hesperopsis alpheus</i> Saltbush Sootywing	Malvaceae family	7
Hesperiinae		
<i>Copaeodes aurantiaca</i> Orange Skipperling	Poaceae family	77
<i>Hylephila phyleus</i> Fiery Skipper	Poaceae family	77
<i>Hesperia juba</i> Juba Skipper	Poaceae family	77
<i>Hesperia comma</i> Common Branded-skipper	Poaceae family	77
<i>Atalopedes campestris</i> Sachem	Poaceae family	77
<i>Ochlodes yuma</i> Yuma Skipper	<i>Arundo donax</i> & <i>Pleuraphis australis</i>	2
Megathyminae		
<i>Megathymus yuccae</i> Yucca Giant-skipper	<i>Yucca brevifolia</i>	1

Table 2

Seasonality of Adult Butterflies Documented to Occur Within Death Valley National Park
(this table is preliminary, since data is still incomplete)

Species	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Papilionidae												
Papilioninae												
<i>Papilio polyxenes</i> Black Swallowtail												
<i>Papilio indra</i> Indra Swallowtail					X	X	X	X				
Pieridae												
Pierinae												
<i>Pontia beckerii</i> Becker's White					X							
<i>Pontia sisymbrii</i> Spring White					X							
<i>Pontia protodice</i> Checkered White										X		
<i>Pieris rapae</i> Cabbage White^m												
<i>Euchloe hyantis</i> Pearly Marble					X							
<i>Anthocharis cethura</i> Desert Orangetip												
<i>Anthocharis sara</i> Sara Orangetip					X							
Coliadinae												
<i>Colias eurytheme</i> Orange Sulphur						X						
<i>Colias cesonia</i> California Dogface												
<i>Eurema nicippe</i> Sleepy Orange^m												
<i>Nathalis iole</i> Dainty Sulphur												
Lycaenidae												
Lycaeninae												
<i>Lycaena arota</i> Tailed Copper						X	X					
<i>Lycaena xanthoides</i> Great Copper						X	X					
Theclinae												
<i>Satyrium behrii</i> Behr's Hairstreak						X	X					
<i>Satyrium fuliginosa</i> Sooty Hairstreak												
<i>Satyrium sylvinus</i> Sylvan Hairstreak						X						
<i>Satyrium saepium</i> Hedgerow Hairstreak						X	X					
<i>Callophrys sheridanii</i> Sheridan's Hairstreak												
<i>Callophrys fotis</i> Desert Elfin												
<i>Callophrys eryphon</i> Western Pine Elfin						X						
<i>Callophrys spinetorum</i> Thicket Hairstreak						X	X					
<i>Callophrys gryneus</i> Juniper Hairstreak												
<i>Strymon melinus</i> Gray Hairstreak						X	X					
Polyommatae												
<i>Brephidium exile</i> Western Pygmy-blue	X			X	X					X		
<i>Leptotes marina</i> Marine Blue												
<i>Hemiargus ceraunus</i> Ceraunus Blue												
<i>Hemiargus isola</i> Reakirt's Blue						X						
<i>Everes amyntula</i> Western Tailed-blue					X							
<i>Celastrina ladon</i> Spring Azure												
<i>Euphilotes battoides</i> Square-spotted Blue					X	X						
<i>Euphilotes enoptes</i> Dotted Blue					X	X						
<i>Philotiella speciosa</i> Small Blue					X							
<i>Glaucopsyche lygdamus</i> Silvery Blue				X	X							
<i>Plebejus icarioides</i> Boisduval's Blue						X						
<i>Plebejus acmon</i> Acmon Blue												
<i>Plebejus lupini</i> Lupine Blue					X	X						

Species	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Riodinidae												
Riodininae												
<i>Apodemia mormo</i> Mormon Metalmark					X							
Nymphalidae												
Nymphalinae												
<i>Thessalia leanira</i> Leanira Checkerspot					X							
<i>Chlosyne palla</i> Northern Checkerspot						X						
<i>Chlosyne acastus</i> Sagebrush Checkerspot					X							
<i>Phyciodes mylitta</i> Mylitta Crescent												
<i>Nymphalis californica</i> California Tortoiseshell												
<i>Nymphalis antiopa</i> Mourning Cloak^m				X	X		X					
<i>Nymphalis milberti</i> Milbert's Tortoiseshell					X							
<i>Vanessa virginiensis</i> American Lady^m										X		
<i>Vanessa cardui</i> Painted Lady^m		X			X	X				X		
<i>Vanessa annabella</i> West Coast Lady					X							
<i>Vanessa atlanta</i> Red Admiral^m					X							
<i>Junonia coenia</i> Common Buckeye^m											X	
Limenitidinae												
<i>Limenitis lorquini</i> Lorquin's Admiral					X	X	X					
Danainae												
<i>Danaus plexippus</i> Monarch^m							X			X		
<i>Danaus gilippus</i> Queen^m												
Satyrinae												
<i>Cercyonis sthenele</i> Great Basin Wood-nymph						X	X					
Hesperiidae												
Pyrginae												
<i>Heliopetes ericetorum</i> Northern White-skipper						X	X					
<i>Pyrgus communis</i> Common Checkered-skipper											X	
<i>Pyrgus scriptura</i> Small Checkered-skipper		X										
<i>Pyrgus albescens</i> White Checkered-skipper							X					
<i>Hesperopsis libya</i> Mojave Sootywing												
<i>Hesperopsis alpheus</i> Saltbush Sootywing												
Hesperiinae												
<i>Copaeodes aurantiaca</i> Orange Skipperling												
<i>Hylephila phyleus</i> Fiery Skipper^m					X							
<i>Hesperia juba</i> Juba Skipper												
<i>Hesperia comma</i> Common Branded-skipper					X	X	X					
<i>Atalopedes campestris</i> Sachem^m					X							
<i>Ochlodes yuma</i> Yuma Skipper					X							
Megathyminae												
<i>Megathymus yuccae</i> Yucca Giant-skipper					X	X	X					

Key: m = Some populations of this species within the United States are known to migrate.

The sample locations were chosen arbitrarily, and the frequency of investigations dramatically varied from one location to the next. As a consequence, significant sampling bias exists within this dataset and therefore comparisons from one location to the next are problematic. That said, Table 3 depicts each of the 56 sampling locations mentioned in this report, along with the site's estimated elevation, and the total number of collective observations made from each of these sites.

Table 3

Butterfly Observation Locations	Mean # of Observations	Elevation (Feet)
Augereberry Point	28	6400
Bennett Peak	01	9900
between Bennett Peak and Telescope Peak	05	9500
Big Sand Spring	01	3200
Brier Spring Road	08	6000
Cottonwood Canyon	08	6600
Cow Creek	02	-200
Cucomungo Canyon	01	5800
Darwin Falls	01	2800
Daylight Pass	15	4300
Dedeckera Canyon	03	4000
Devils Hole	01	2400
Emigrant Spring	13	4000
Eureka Dunes	01	3000
Eureka Valley Road	01	2900
Furnace Creek	05	-180
Grapevine Canyon	09	2500
Grapevine Peak	11	8700
Greenwater Valley	03	3900
Hanging Rock Canyon	08	4200
Hidden Valley	02	4600
Hunter Mountain	56	7400
Jubilee Pass	16	1250
Last Chance Spring	21	5700
Lee Flat	01	5500
Mahogeny Flat	15	8100
between Mahogeny Flat and Roger's Peak	09	9000
Manly Peak	01	7100
Mesquite Spring	08	1800
Nemo Canyon	05	4000
Phinney Canyon	05	6400
Pyramid Peak	09	6700
Racetrack Road	07	4100
Roger's Peak	17	9900
Salisbury Pass	01	3300
Salt Creek	01	-250
Saratoga Springs	05	1000
Scotty's Castle	15	3000
Skidoo	02	5600
South Fork Lemoigne Canyon	03	4800
Surprise Canyon	26	4000
Telescope Peak	23	11000
Thorndike	28	7420
Tin Mountain	08	8900
Titanothera Canyon	09	3100
Titus Canyon	23	4040
Tuber Canyon	10	4000
Virgin Spring Canyon	11	850
Wahguyhe Peak	01	8600
Water Canyon	16	7000
White Top Mountain	11	6800
Wildrose Canyon	37	3700
Wildrose- Charcoal Kilns	18	7000
Wildrose Peak	01	9064
Willow Spring- Black Mountains	09	2800

Some locations mentioned in various source material were not depicted graphically or tabularly due to the location information was too general or was from an undetermined site. For example, there were some reports that listed locations as "Panamint Mountains", "Death Valley National Park in Nevada", or "East Entrance of park near US Highway 58." In this last example, the author was unable to find any current road near the park that has a "58" designation. If the locations were unknown, unverified, or too general, this sighting record was left off from any further analysis.

In spite of a limited dataset (considering that there are 68 species of butterflies within the park), certain broad trends were noted. To assess if there was an elevational or habitat relationship, each sample location was assigned to one of three ecological zones: Lower Sonoran, Upper Sonoran and Pinyon-Juniper Zones. For the sake of this analysis, sites were assigned to the Lower Sonoran Zone if the sample site's elevation was less than 4,000 feet above sea level. Upper Sonoran Zone was assigned to those sites from 4,000 feet to less than 7,000 feet. The Pinyon-Juniper Zone was selected for those sites with an elevation of 7,000 feet or higher. Given these assumptions, there did appear to be a correlation between butterflies and habitat (based upon elevation). Both the mean number of butterfly observations per ecological zone (Figure 1) and mean number of butterfly species per ecological zone (Figure 2) indicate a positive correlation between the presence of butterflies and species diversity with elevation. Therefore, generally, the higher regions of the park provide better butterfly habitat than the lower regions. This of course is dependent upon the specific habitat in question, time of the year, quantity of rainfall in any given year, the presence or absence of nectar sources, and a variety of other factors.

Besides assessing butterfly occurrence within general ecological zones, attempts were made to assess association with specific vegetation communities. This approach appeared reasonable, since butterflies are usually closely associated with specific nectar and plant food sources. The top five vegetation types in which butterfly observations were made occurred (in descending order) within the Creosote, Blackbrush, Sparse Vegetation, Shadscale, and Pinyon vegetation classifications. The least frequent butterfly observations occurred within the Urban, High Elevation Wash System, Big Sagebrush, Mining and Rural Development classifications. Again, this data is highly influenced by sampling bias. For example, it is not unusual that the majority of butterfly sightings have occurred within the Creosote vegetation classification, since a large percentage of the total park is represented by this vegetation type. When an attempt to normalize the data by dividing the observational data by the total acreage within the park of each particular vegetation type, different results are obtained. Normalization in this fashion indicates that the top five vegetation classifications for butterfly observations (an indication of total butterfly abundance) are: Limber/Bristlecone Pine, Rural Development, Mining, Blackbrush, and Sparse Vegetation. This approach also appears to be highly influenced by sampling bias. For instance, the high accessibility of Rural Development (such as at Furnace Creek) and thereby higher chances of observing butterflies, coupled with the relatively small percentage of these developments compared to the entire park, produces what is likely an artificially high butterfly observation (density) value. An additional problem with attempting to assign butterfly observations to a particular vegetation type obtained from computerized vegetation maps is that the factors influencing butterfly occupancy may often be the micro conditions, such as the presence of a spring water source, which has little bearing upon the surround vegetation type in which the vegetation map depicts. The vegetation map is not to the scale sufficient to capture the actual on-the-ground conditions influencing butterfly habitat. Much work in refining habitat associations is needed before any meaningful habitat associations and/or quality of habitat comparisons may be made, except in the most broad and general situations.

While site comparisons are currently unreliable, stand-alone site specific assessments may be made. According to this data, among the 56 sites investigated, Hunter Mountain has the highest butterfly species diversity. The 35 butterfly species documented on Hunter Mountain represents extremely high species diversity. The next most diverse sites, in descending order, are as follows: Wildrose Canyon (29 species), Titus Canyon (20 species), Auguereberry Point (20 species), Last Chance Spring (19 species), Telescope Peak (19 species), Thorndike (18 species), Surprise Canyon (16 species), and Scotty's Castle (14 species). However, since these same identical sites top the list of the most frequently observed sites, this list of highest species diversity sites is mostly an artifact of sampling bias. It does indicate that upon sufficient investigation within many park locations, high butterfly species diversity will likely be discovered.

The sites with the lowest species diversity are even more a factor of sampling bias, since many of the sites have only one observation. However, there were a few sites that had low species diversity and relatively higher levels of observation. This would indicate that even with higher effort, species diversity remains low. These sites include (in no particular order): Grapevine Canyon, Cottonwood Canyon, Mesquite Spring, Tuber Canyon and Saratoga Springs. Perhaps Mesquite Spring could be explained by the limited extent of the riparian habitat and the distance from regions of higher butterfly densities. At first glance, the low species diversity and butterfly density at Saratoga Springs seemed unusual, since this is such an extensive wetland habitat. However, it is considerably isolated and distant from other areas of butterfly densities or diversity.

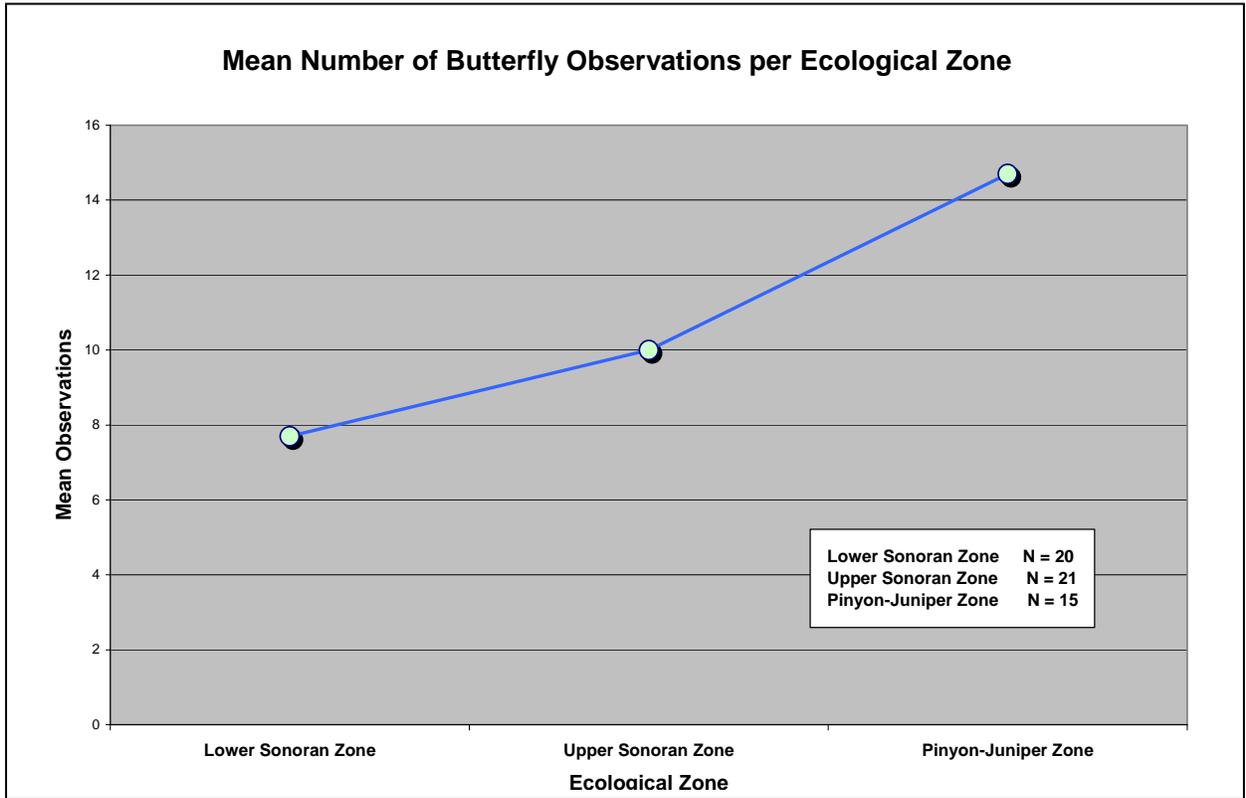


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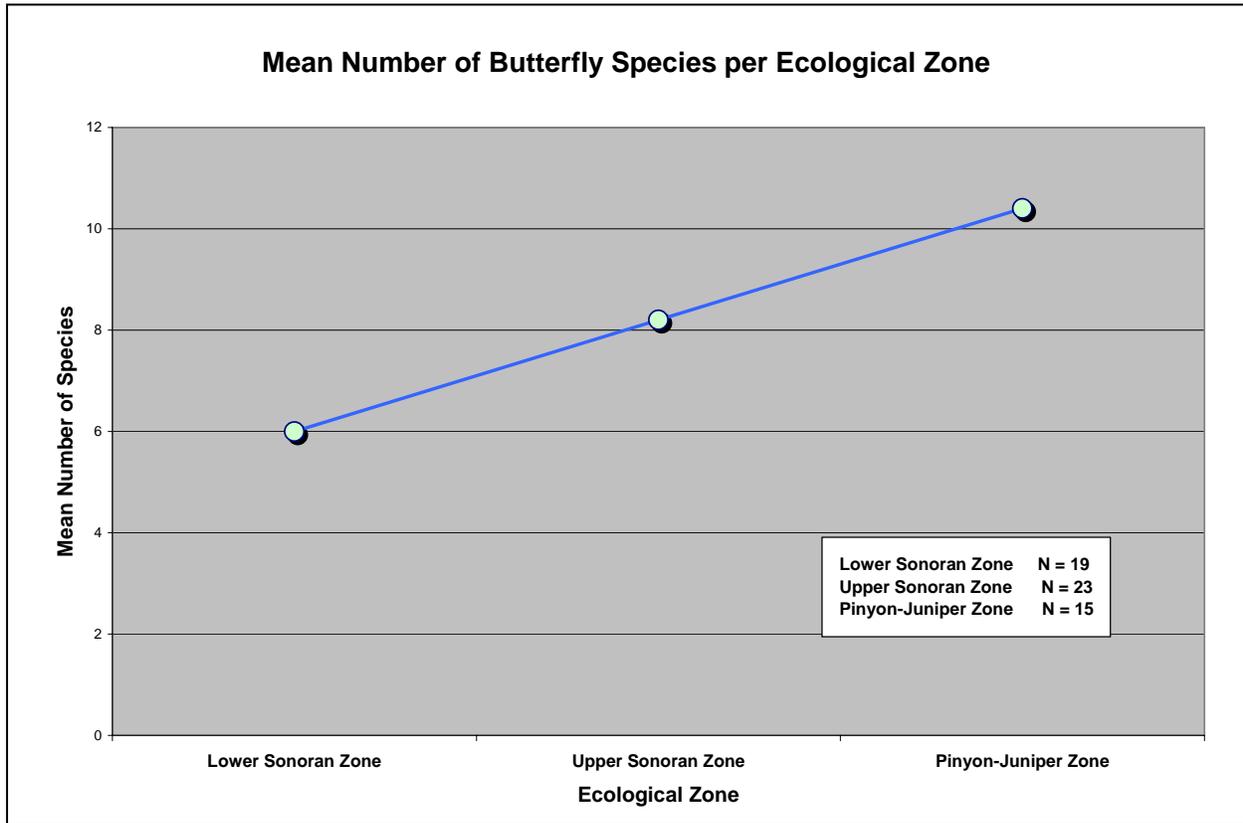


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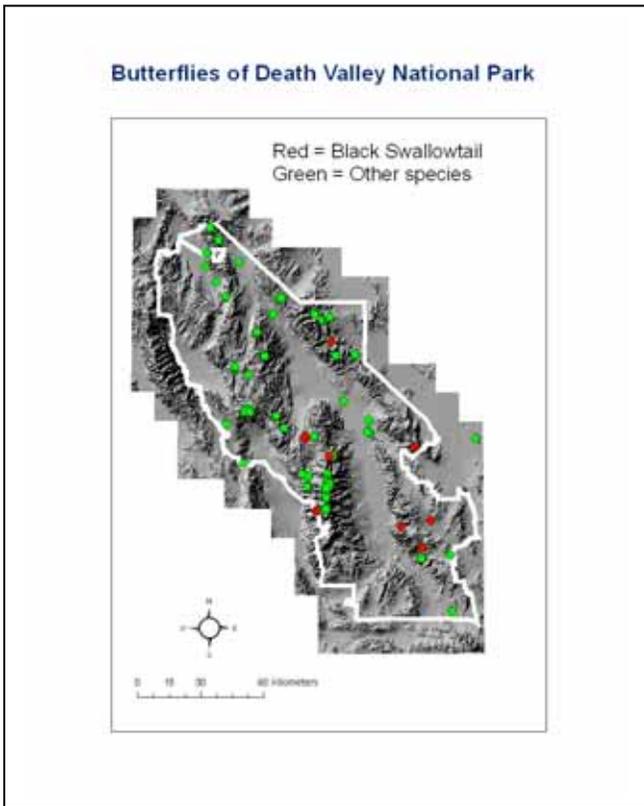


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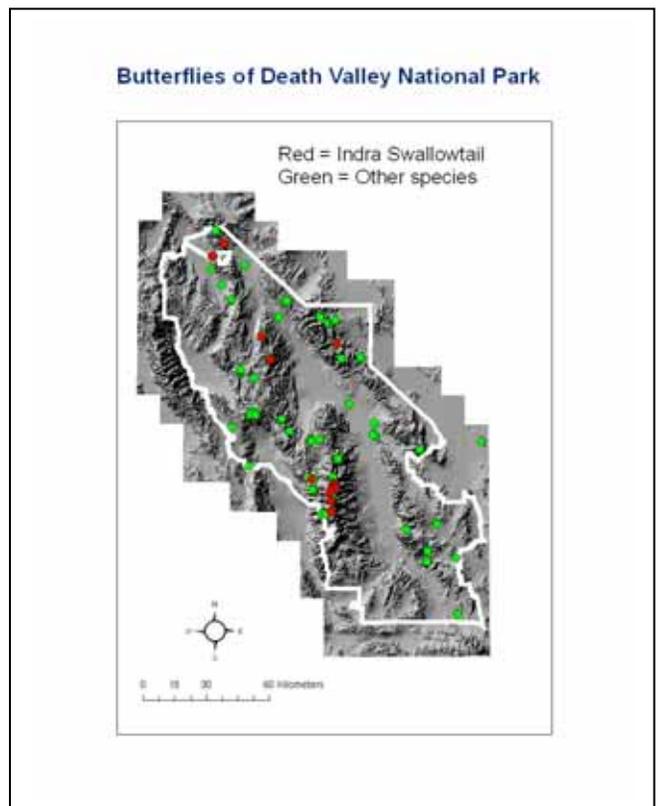


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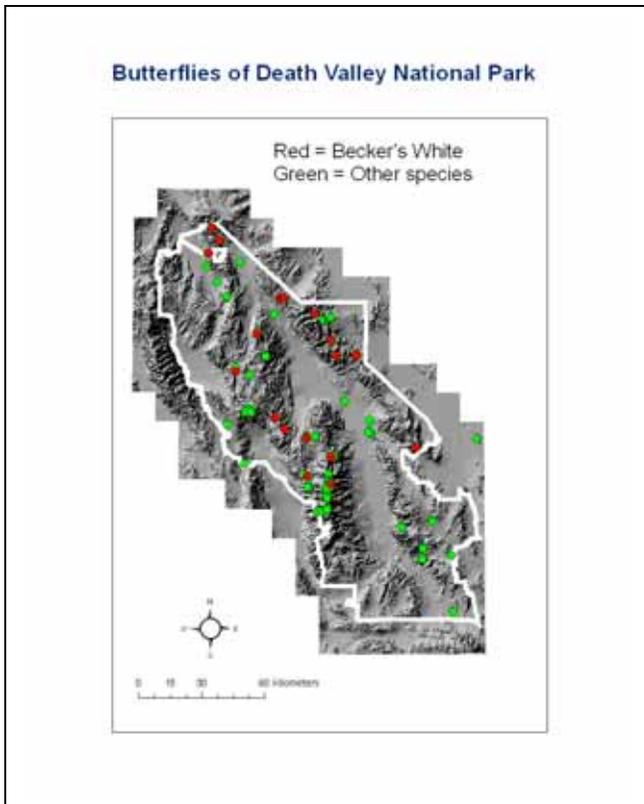


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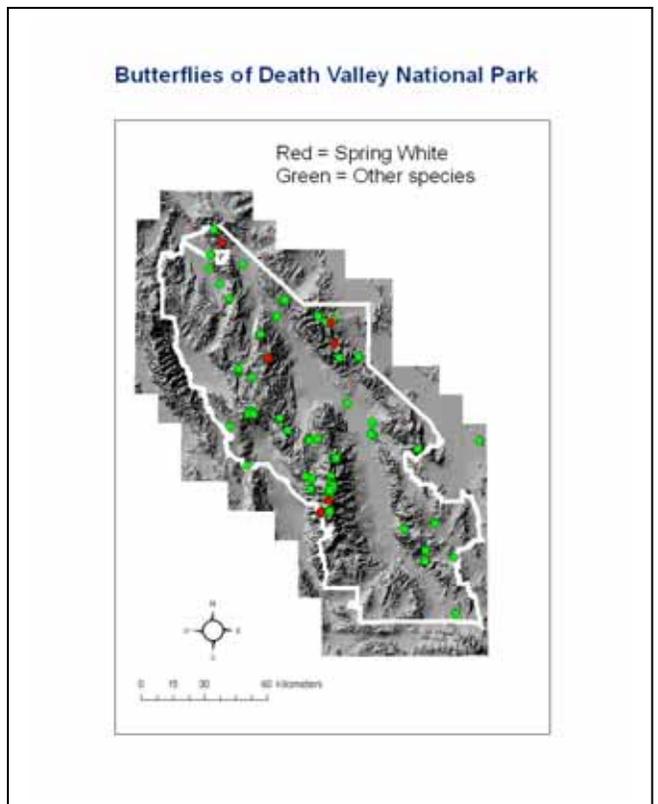


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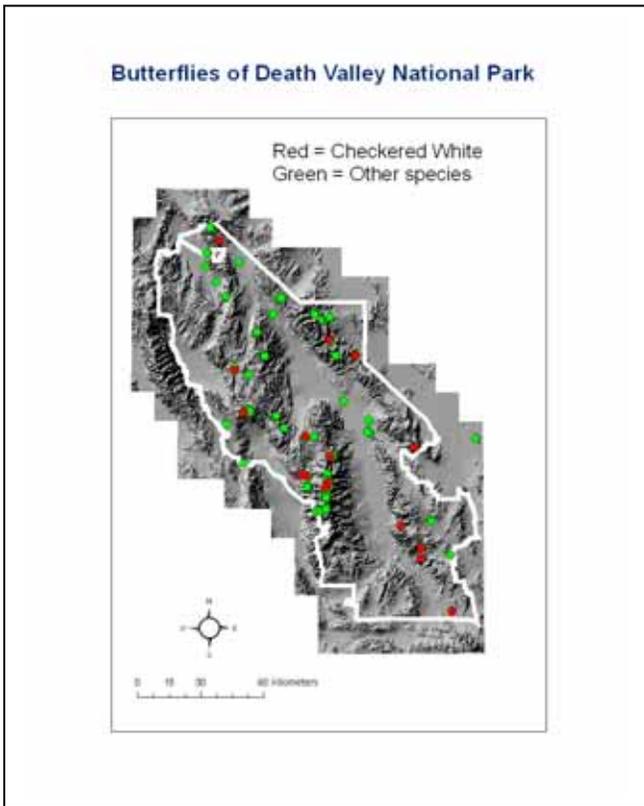


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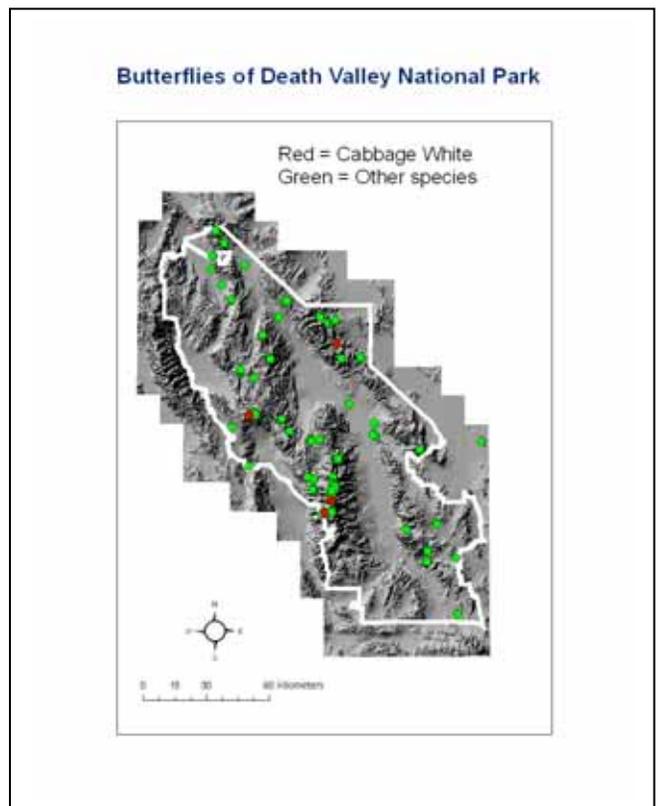


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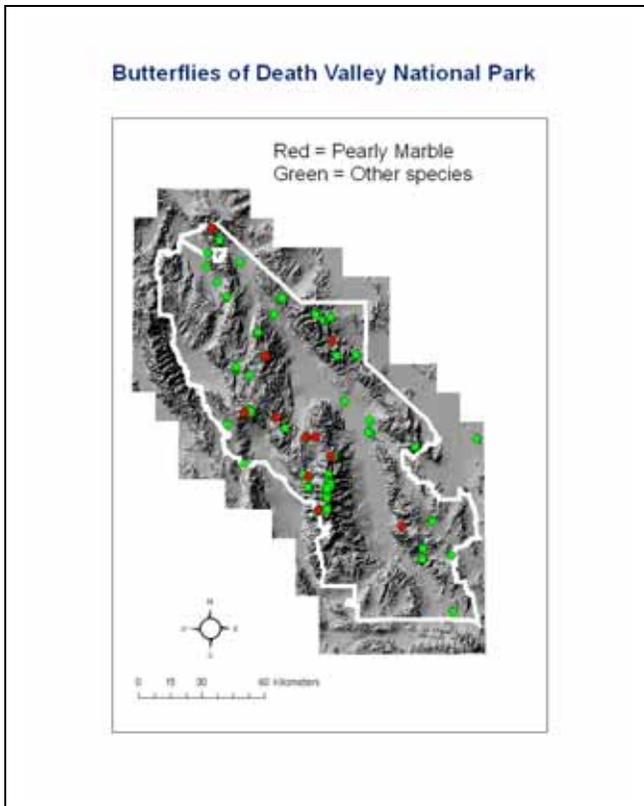


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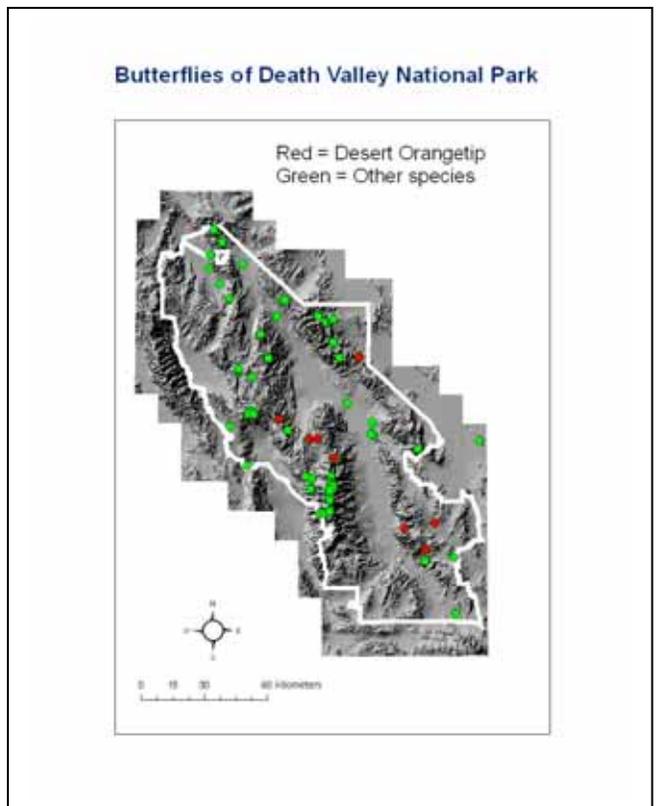


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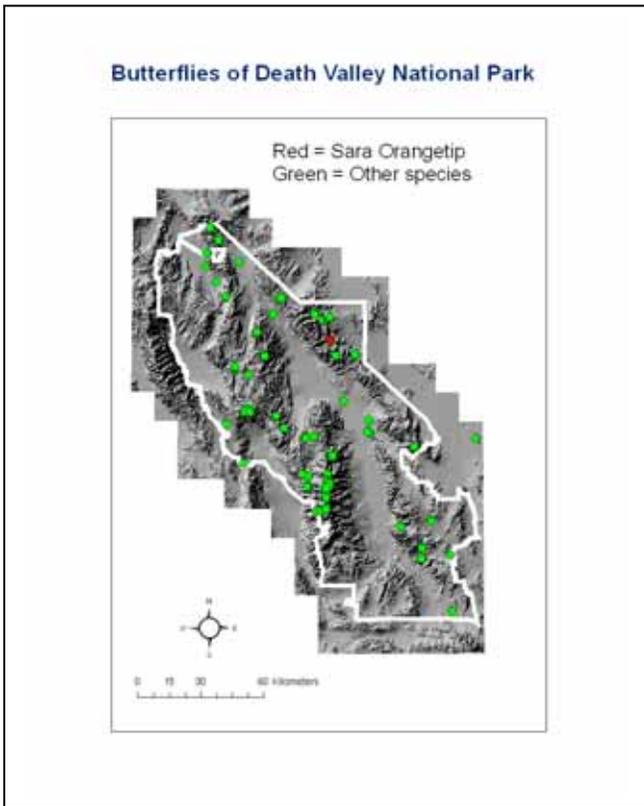


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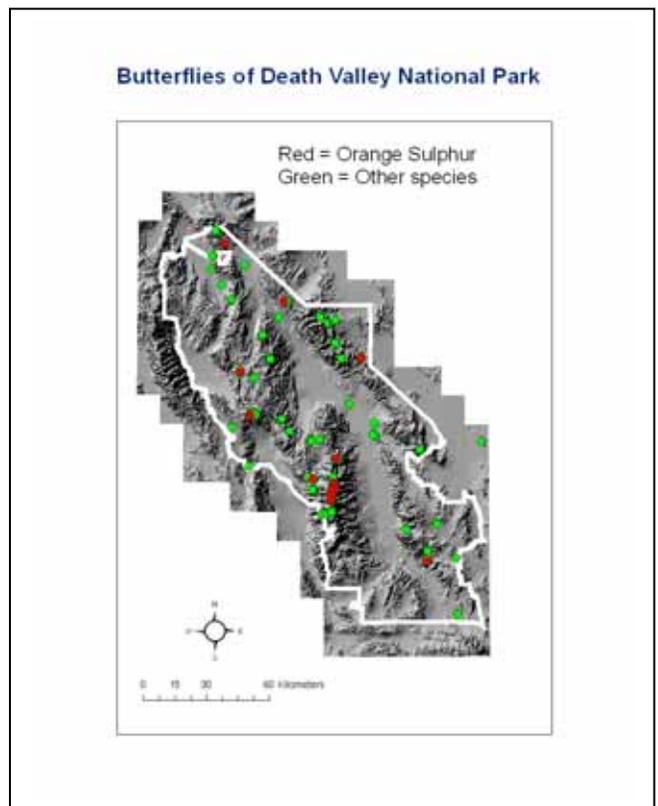


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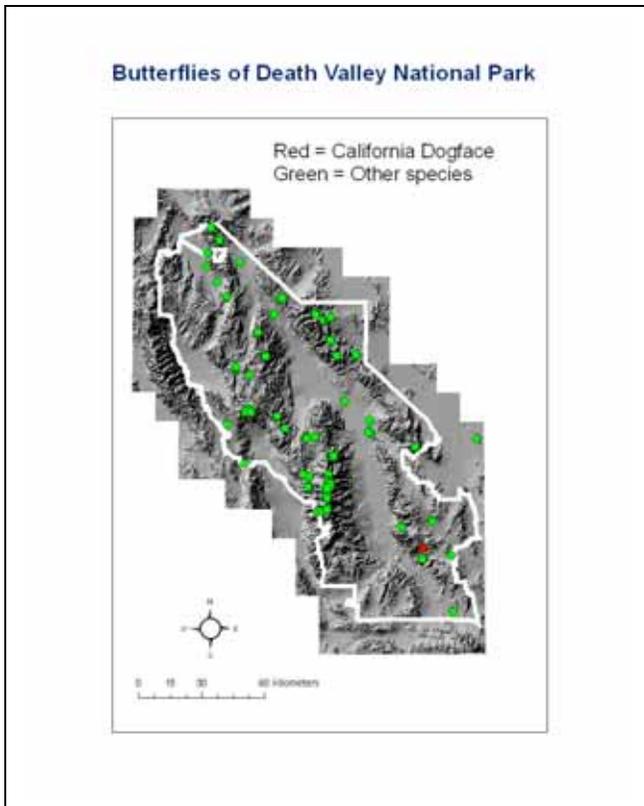


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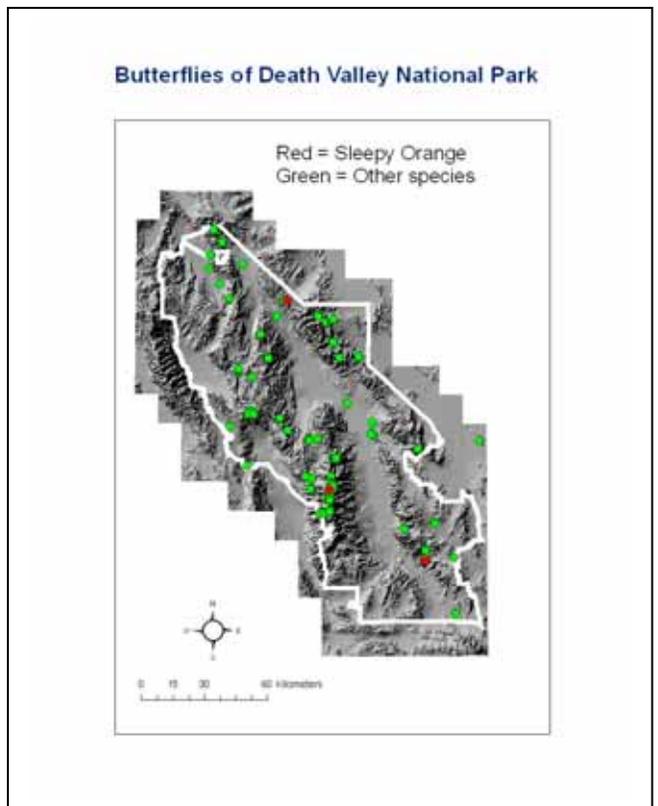


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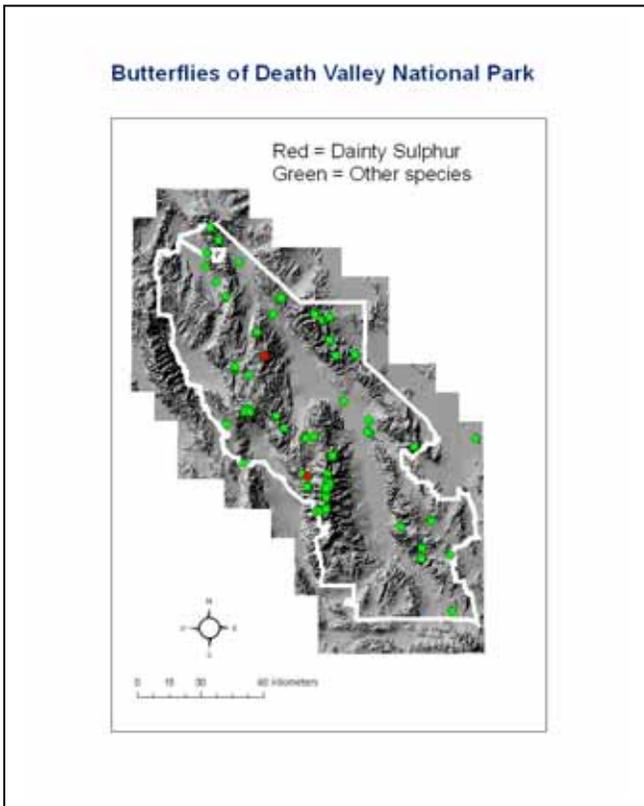


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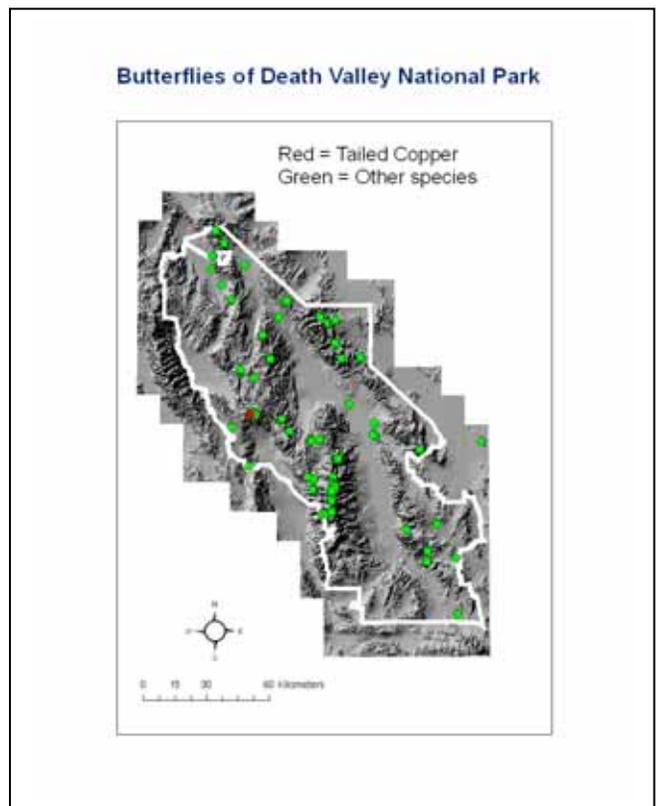


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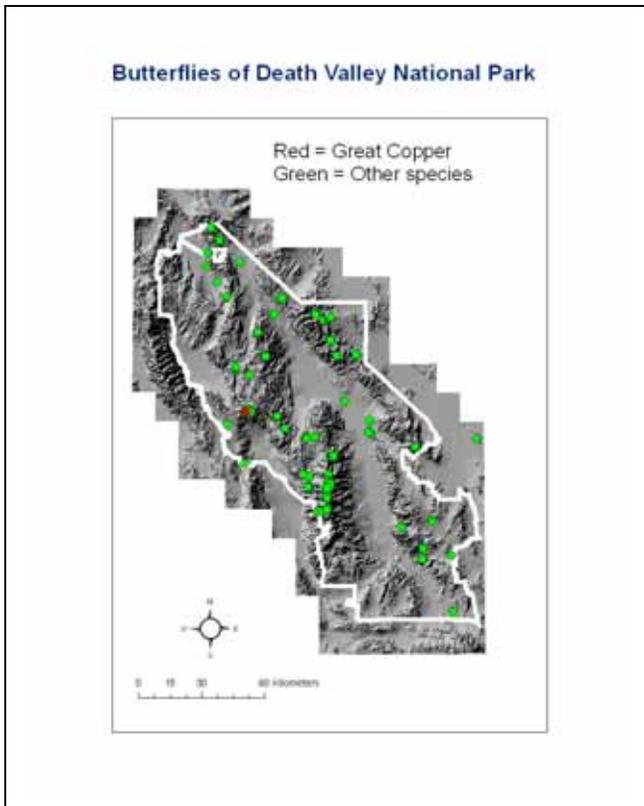


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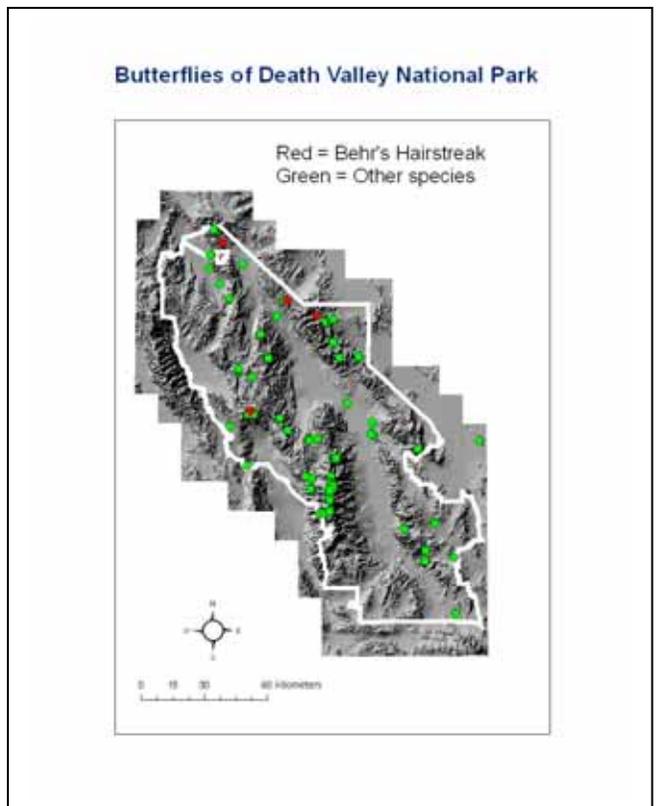


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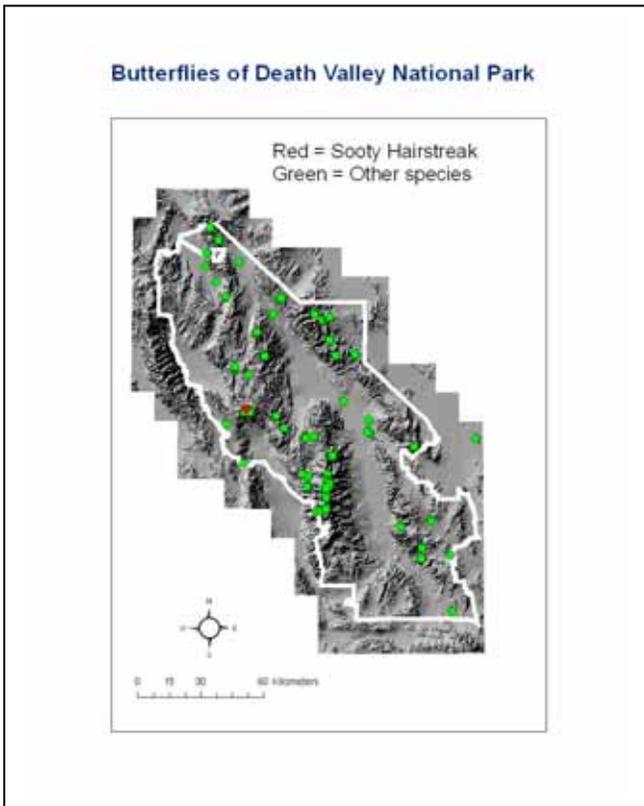


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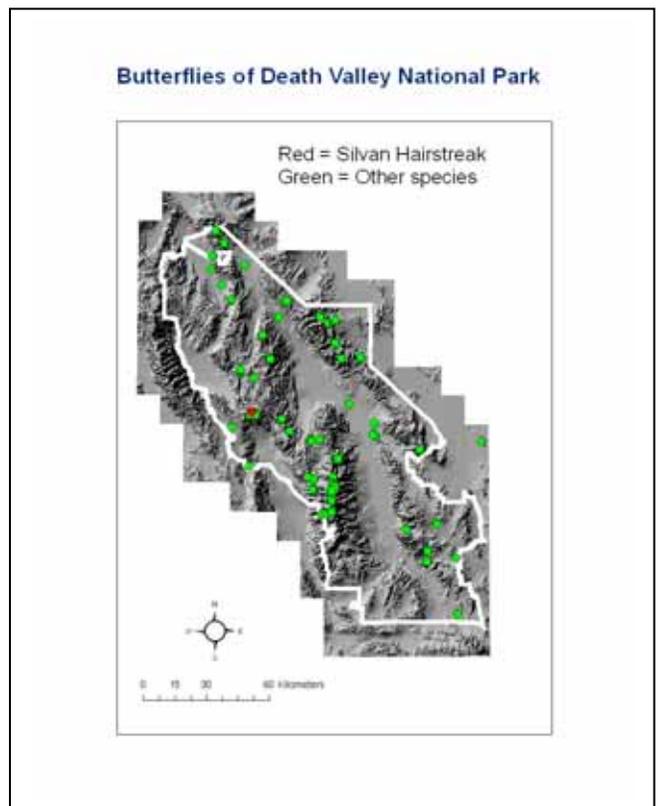


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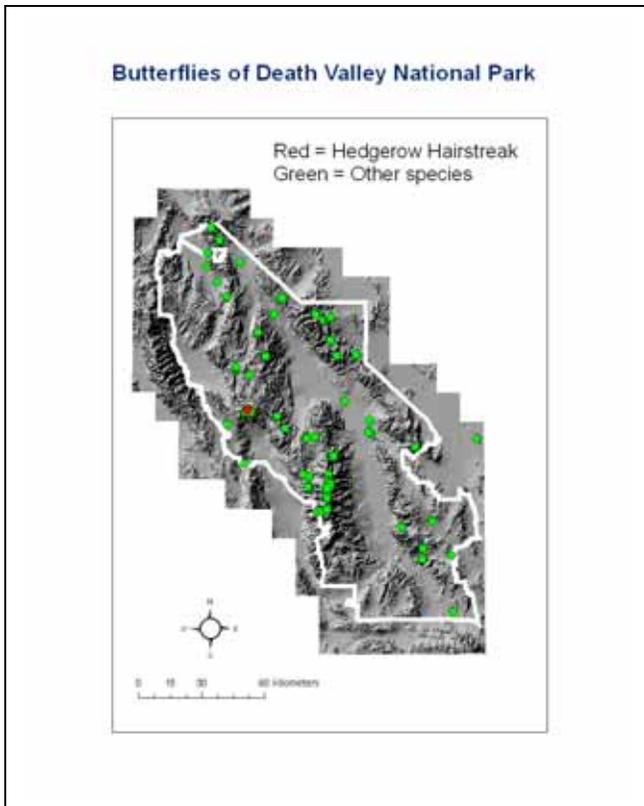


Figure 21



Figure 22

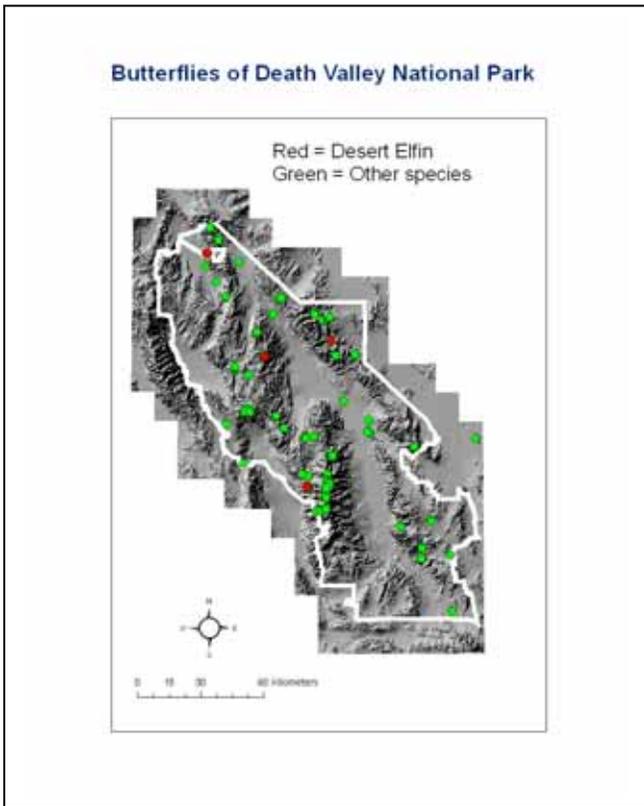


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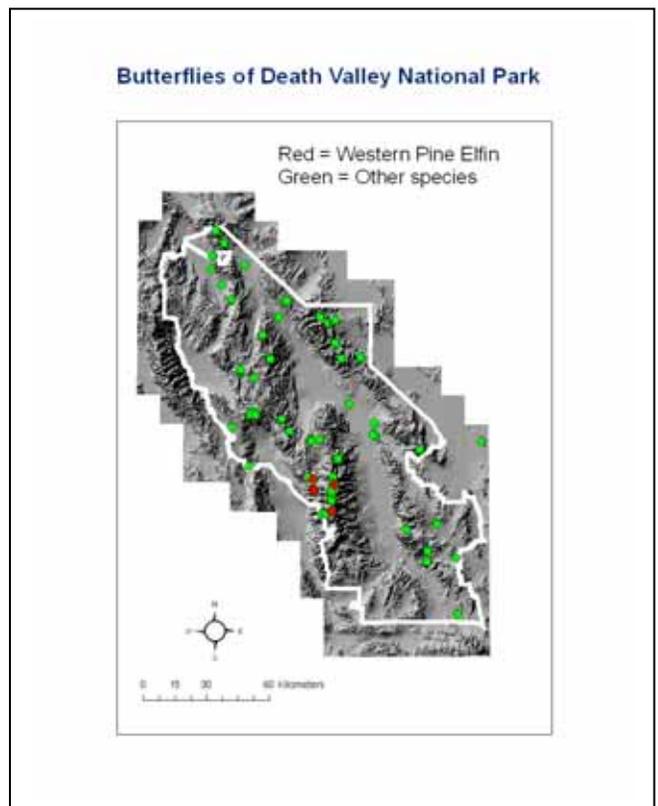


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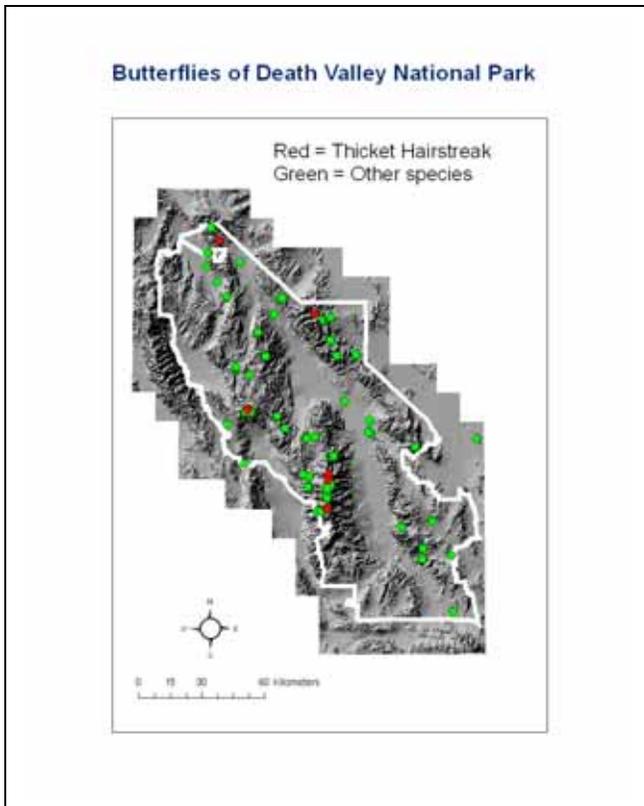


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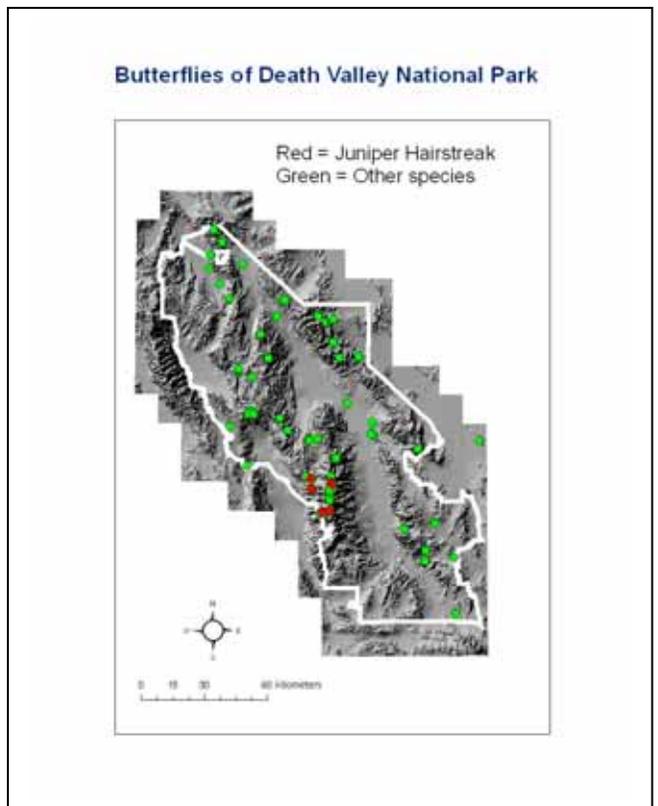


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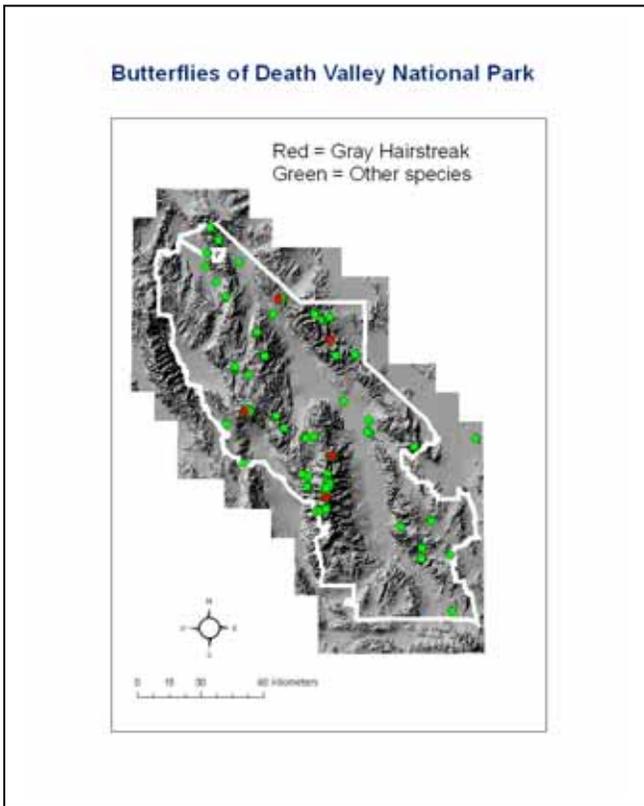


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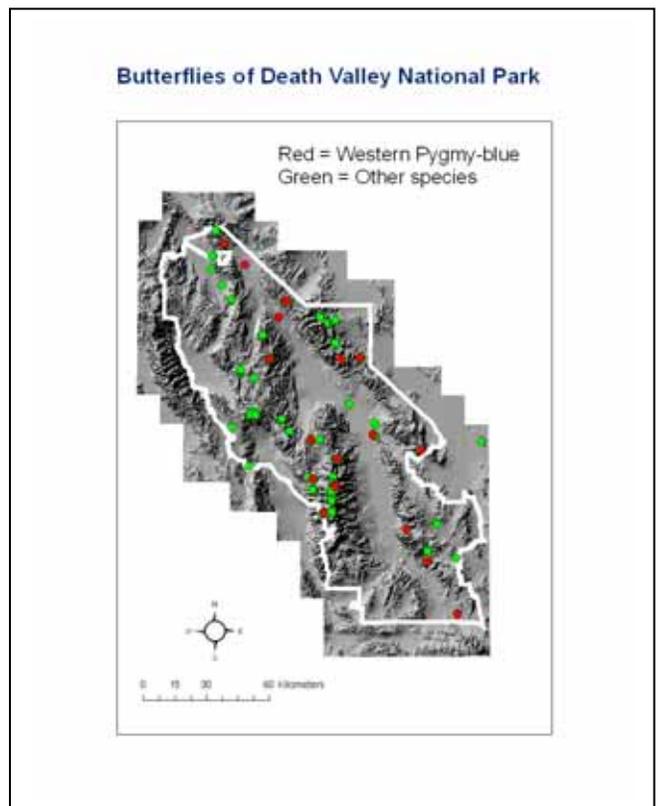


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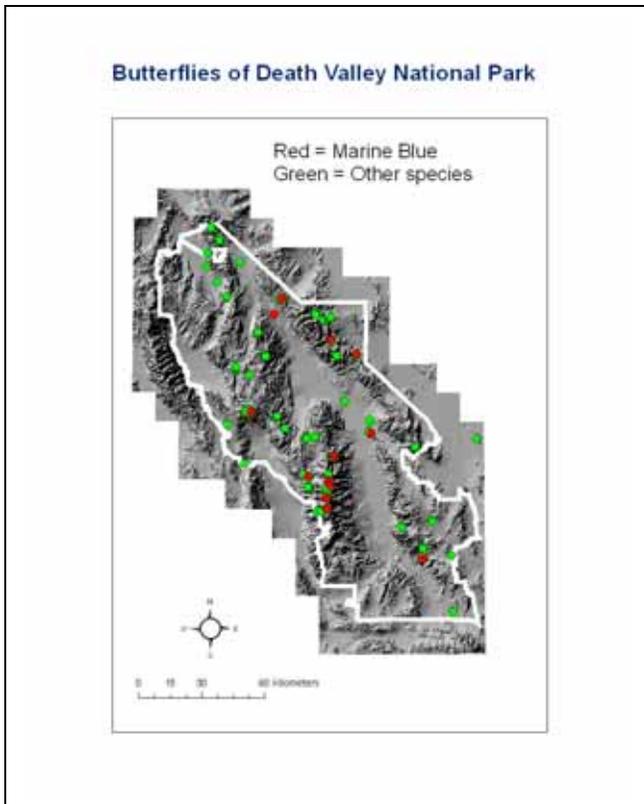


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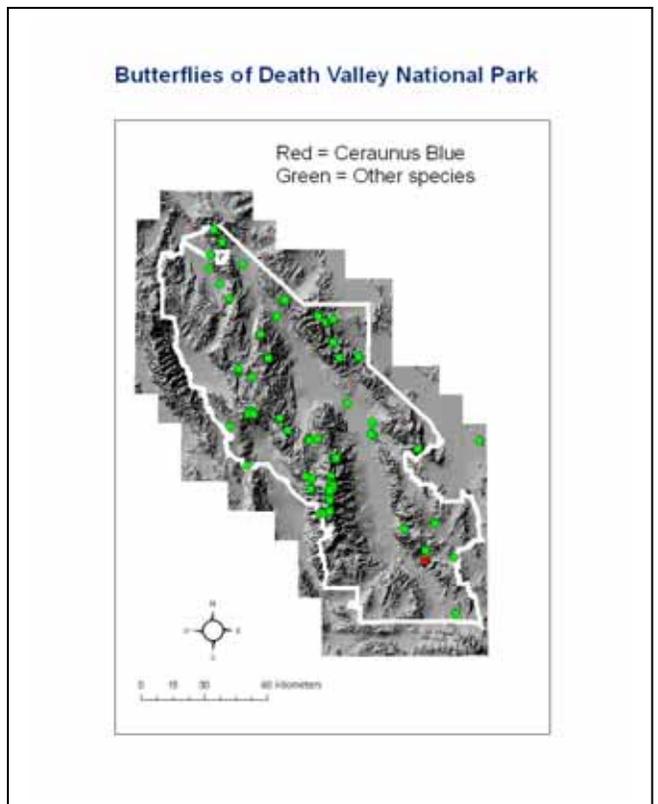


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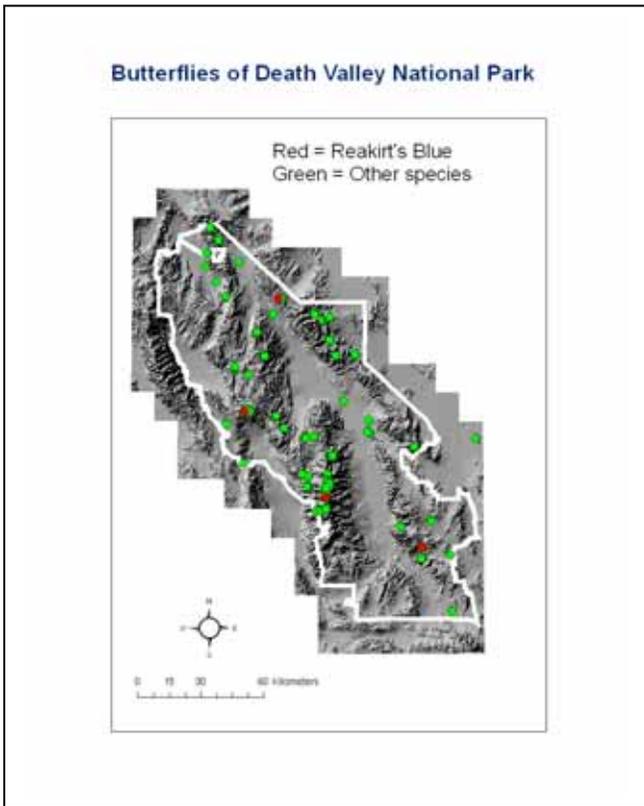


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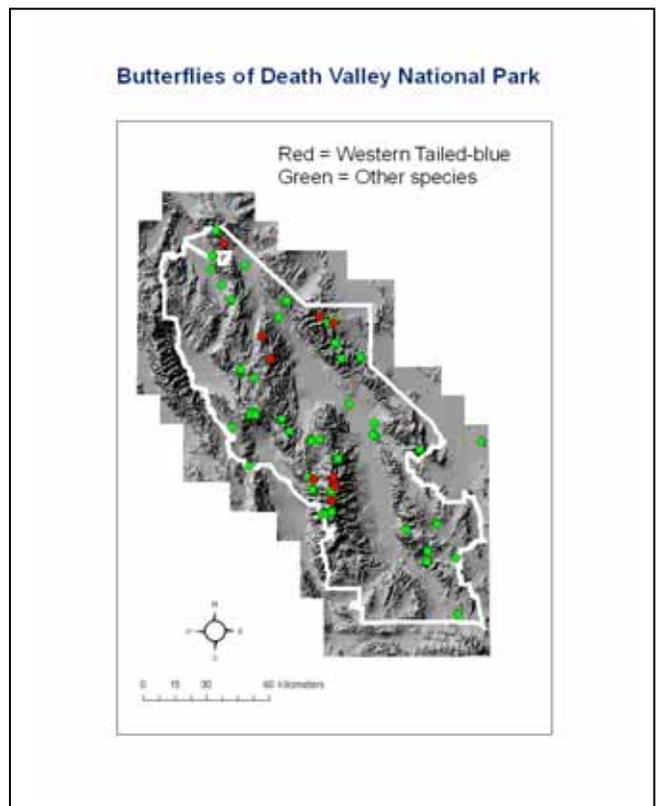


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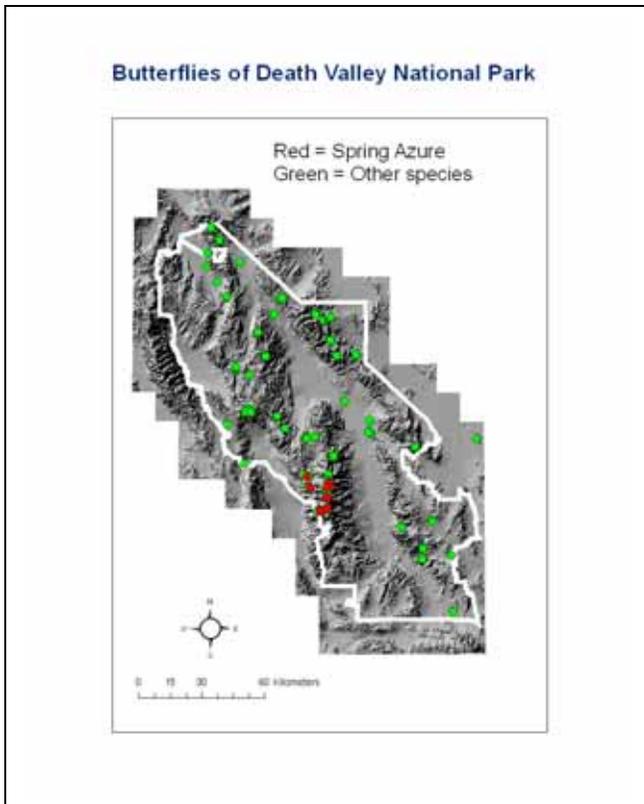


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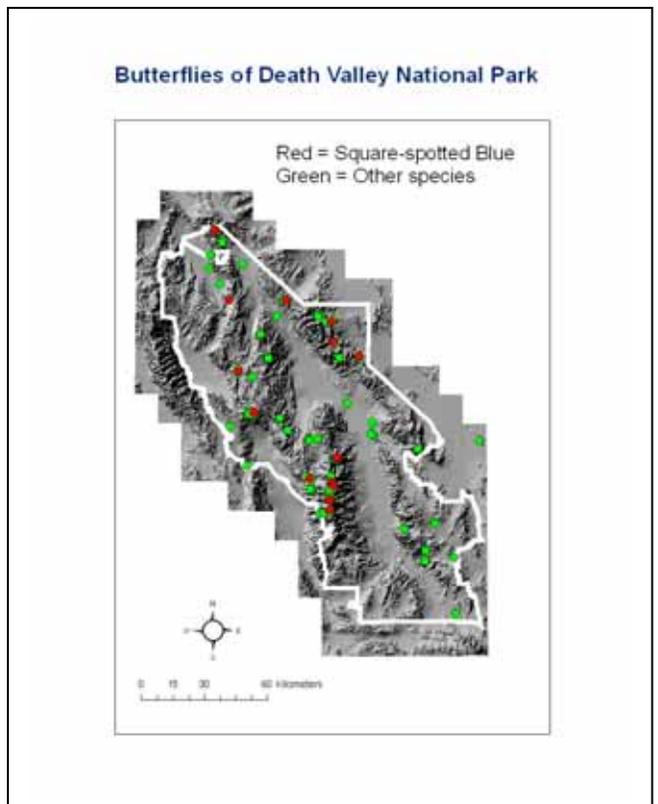


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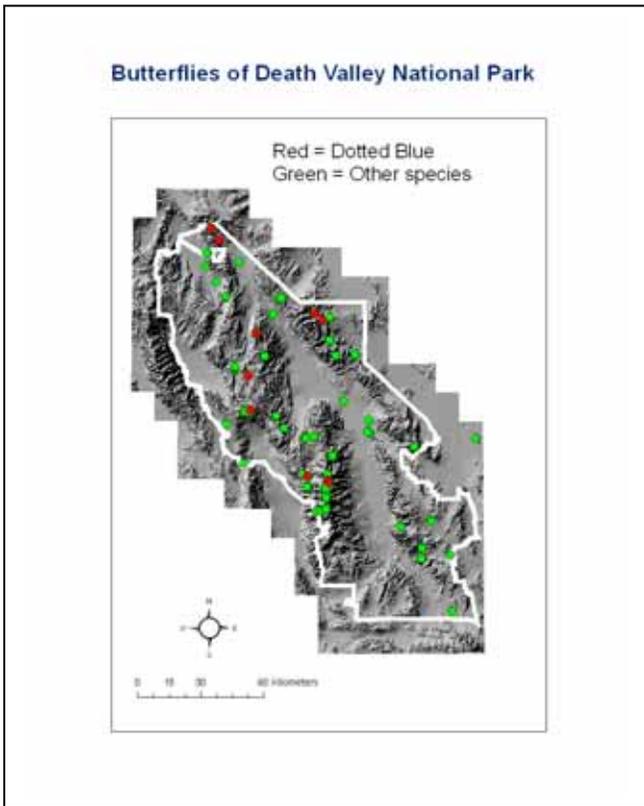


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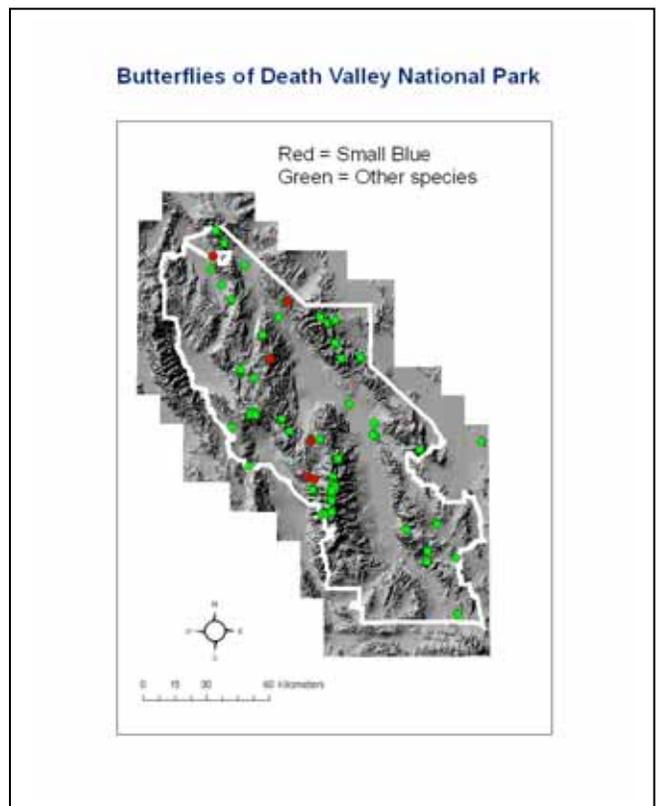


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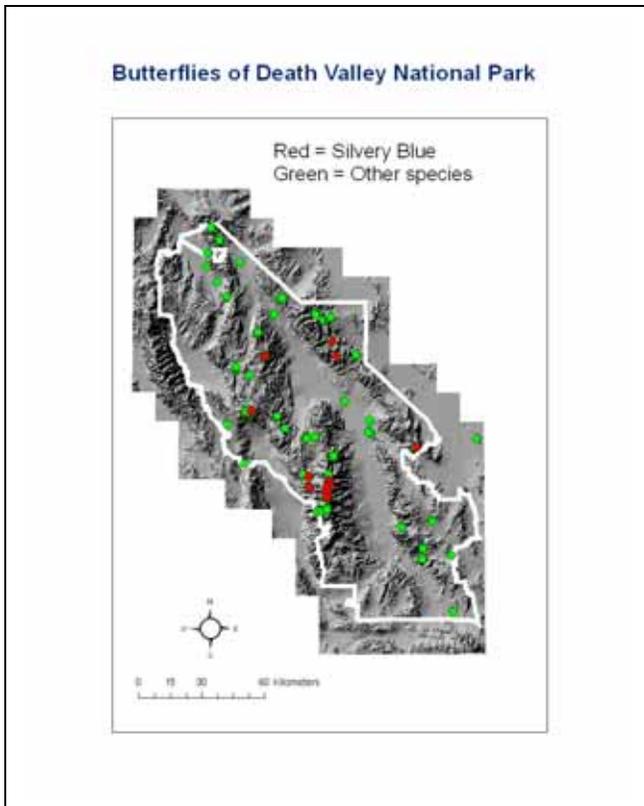


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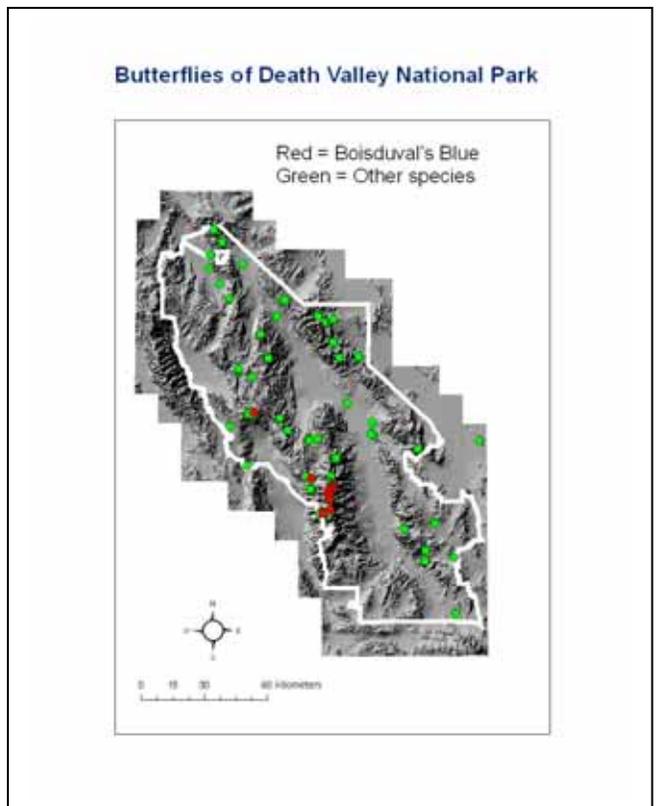


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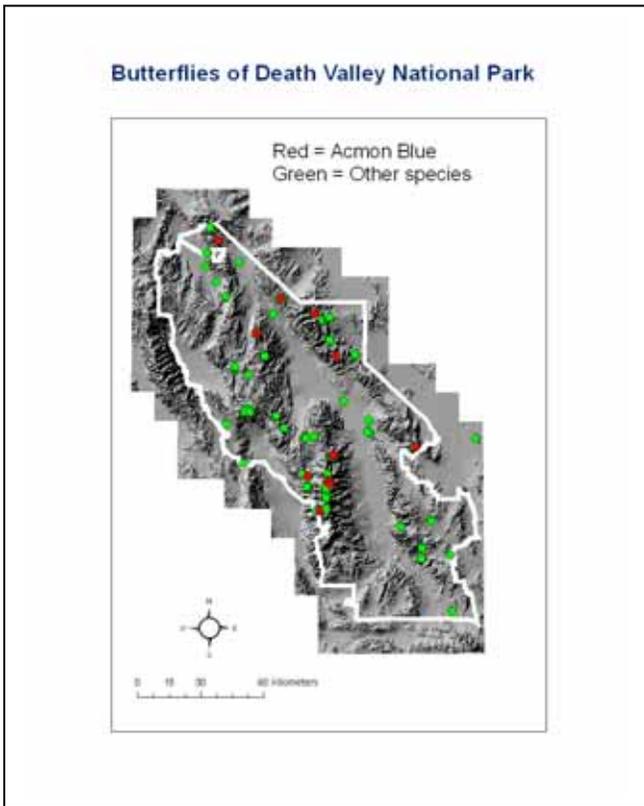


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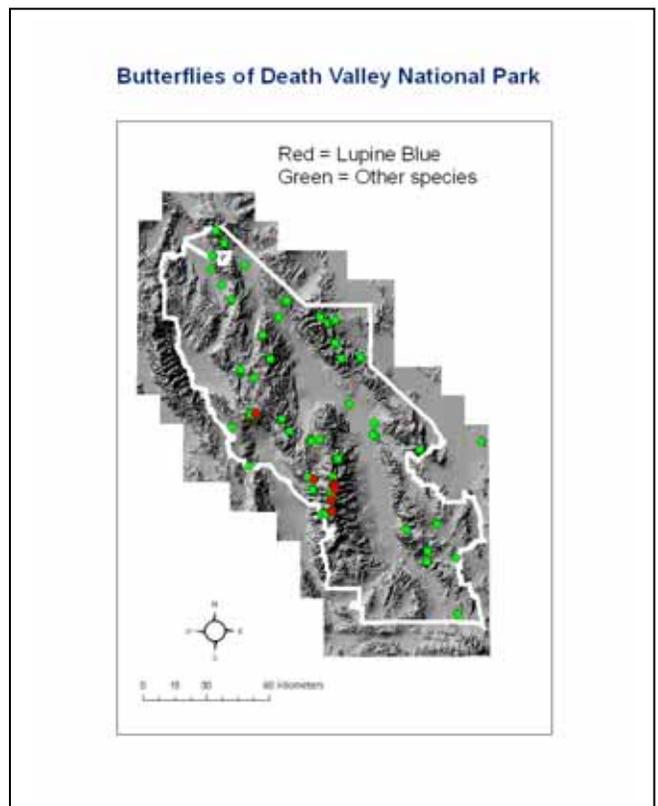


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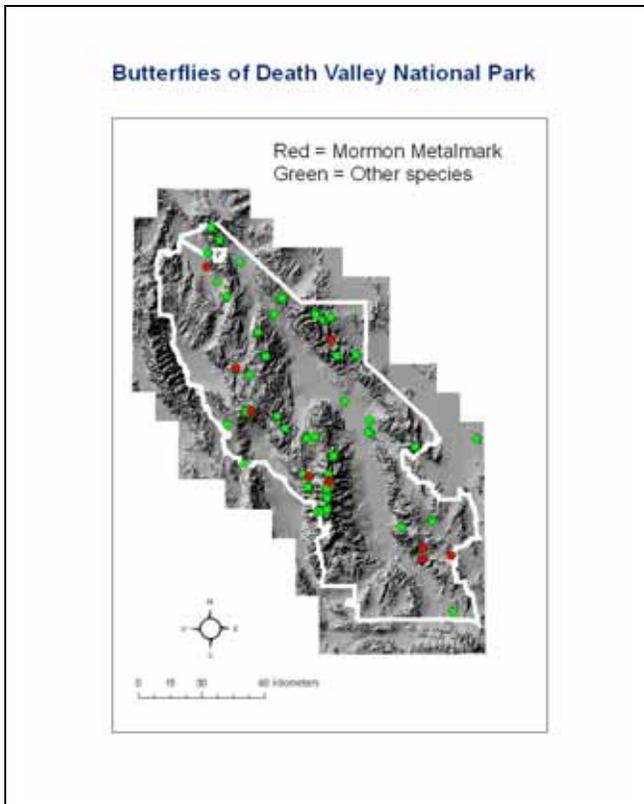


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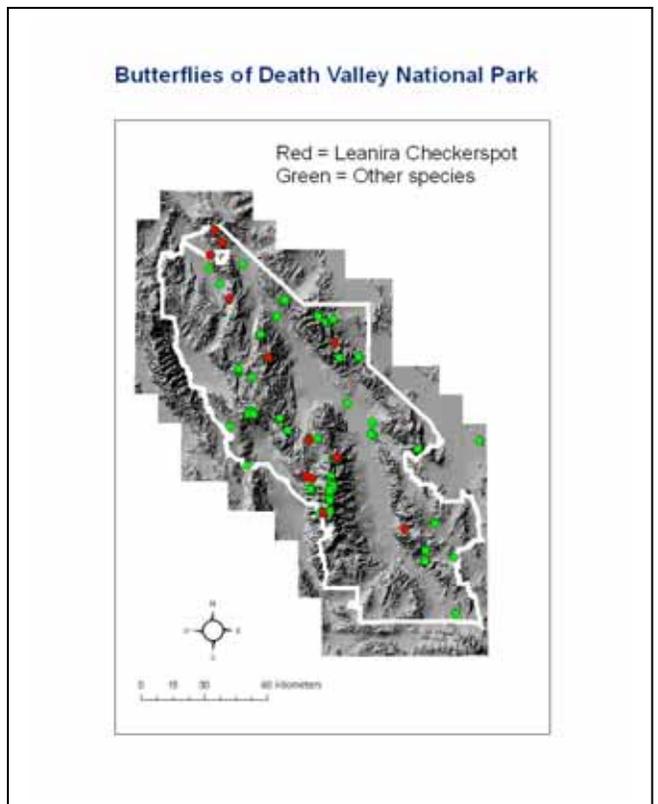


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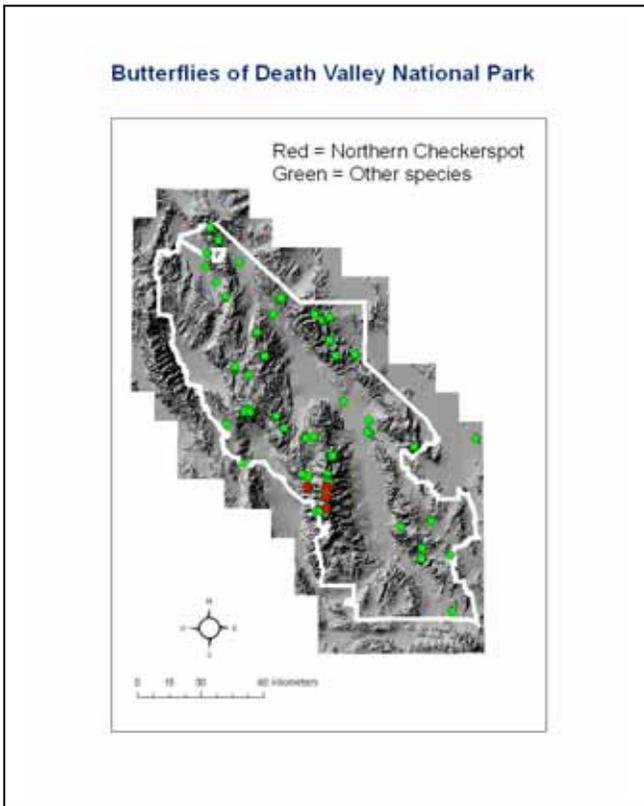


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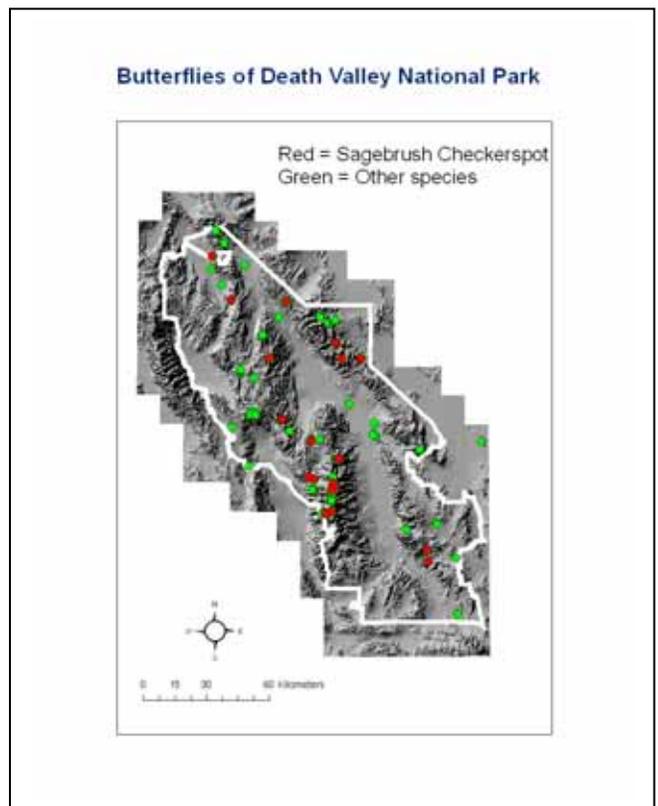


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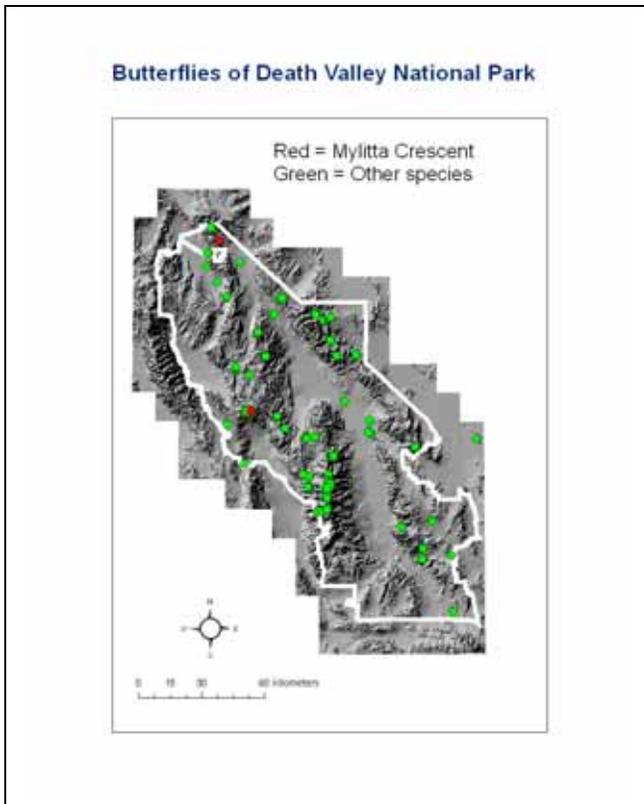


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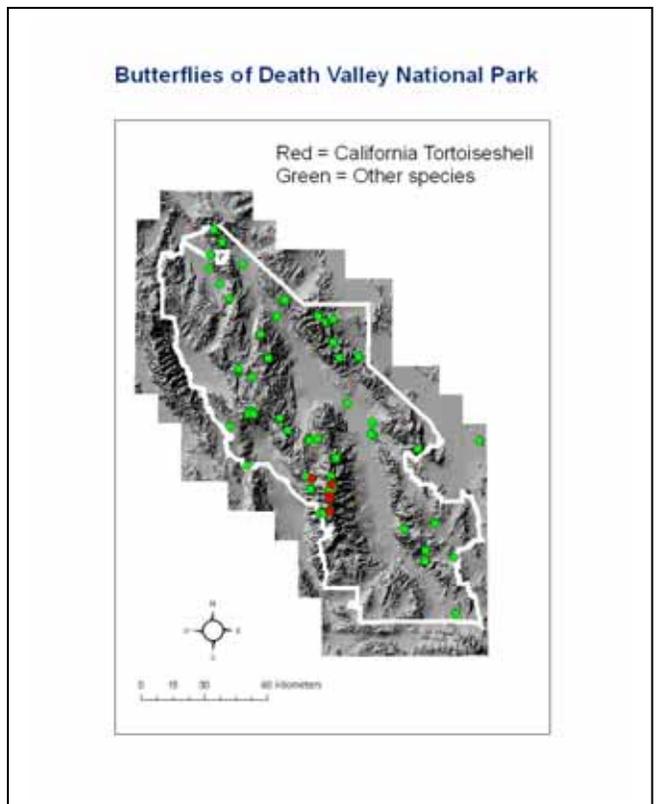


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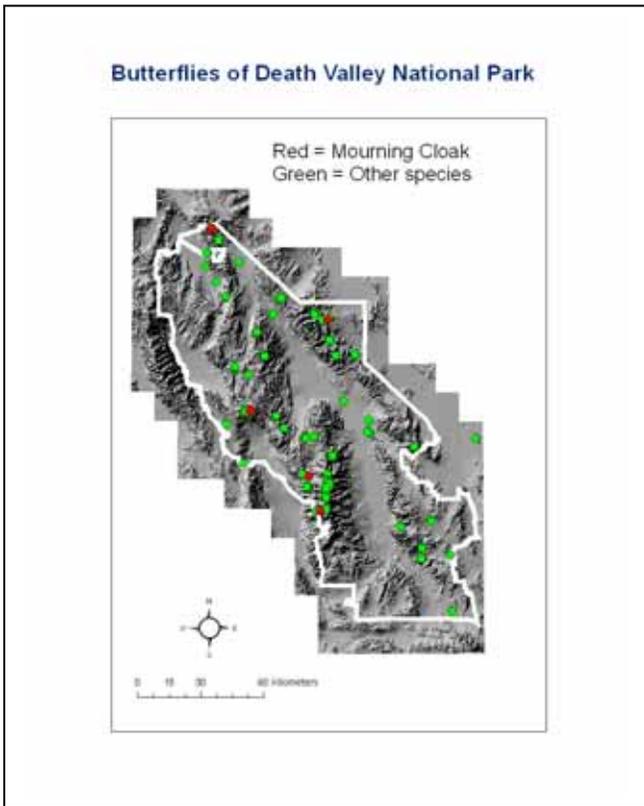


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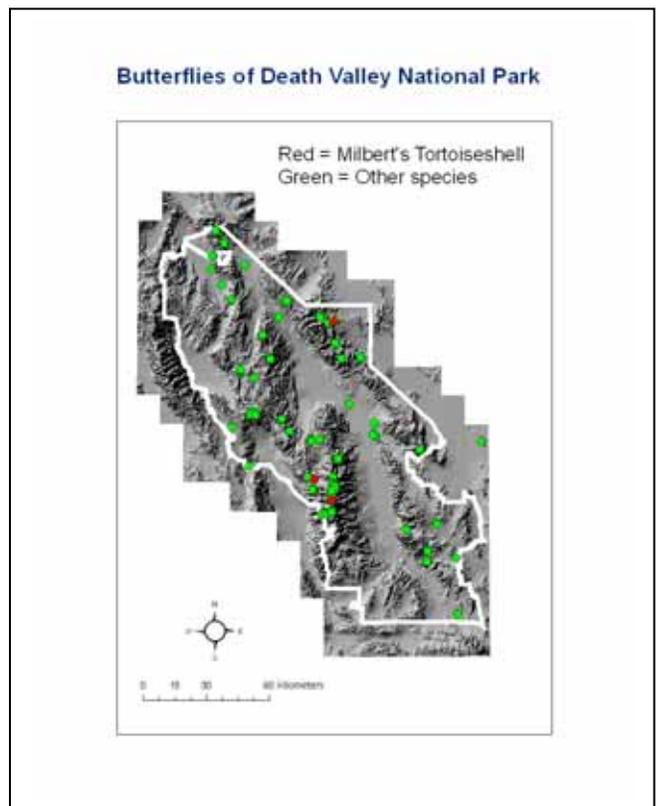


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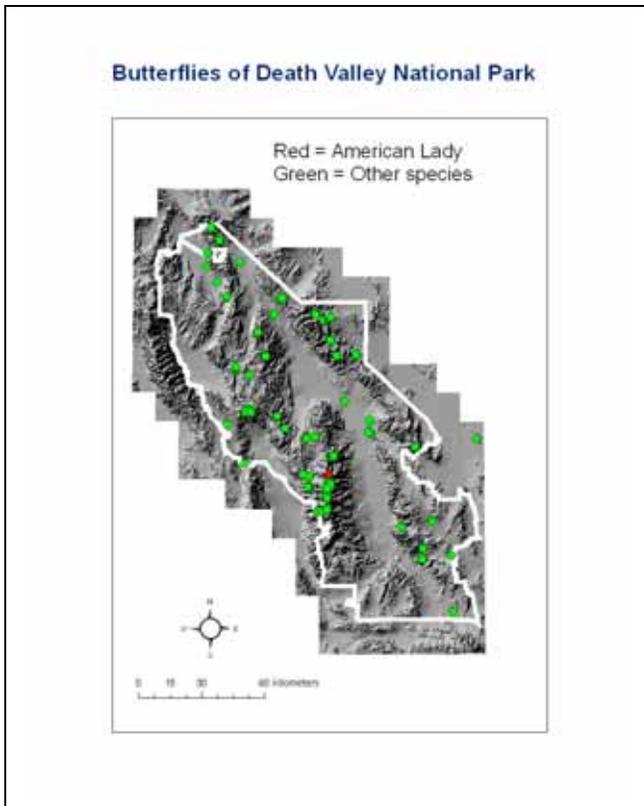


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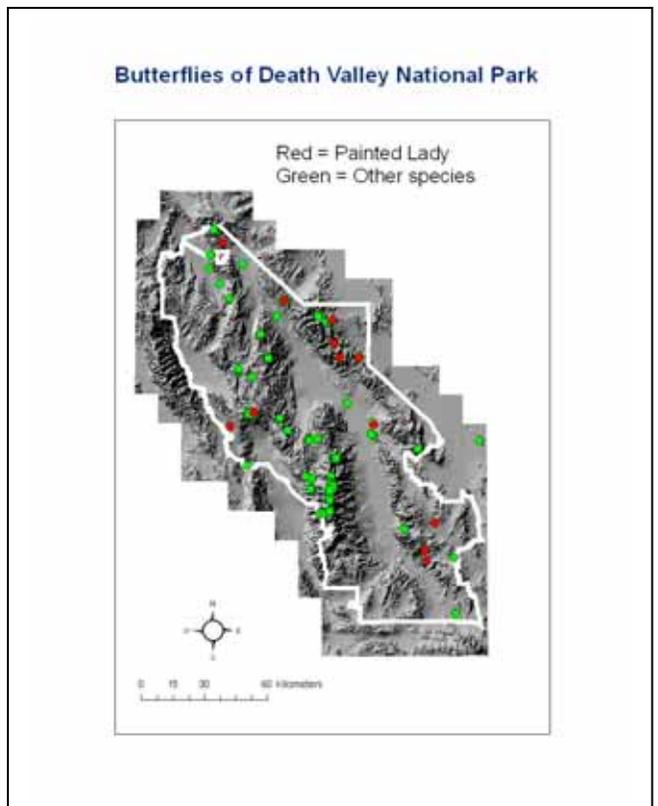


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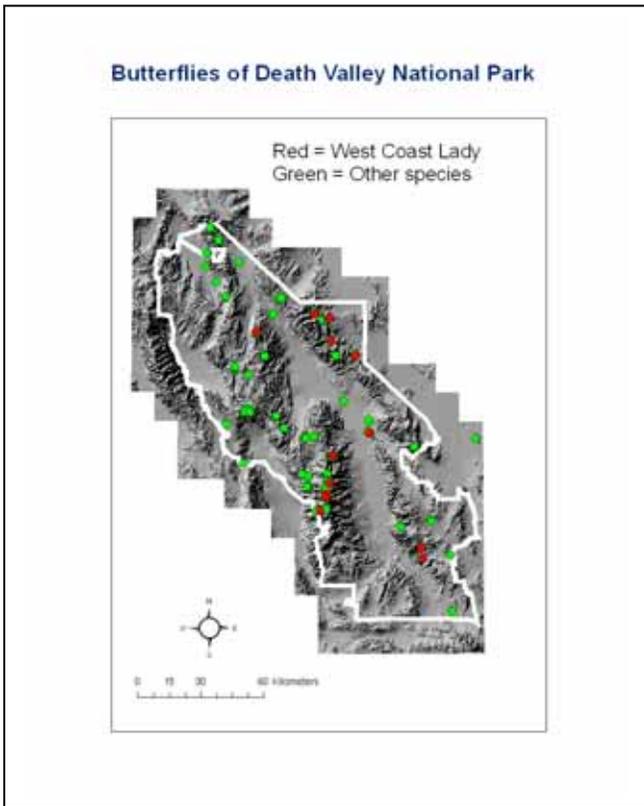


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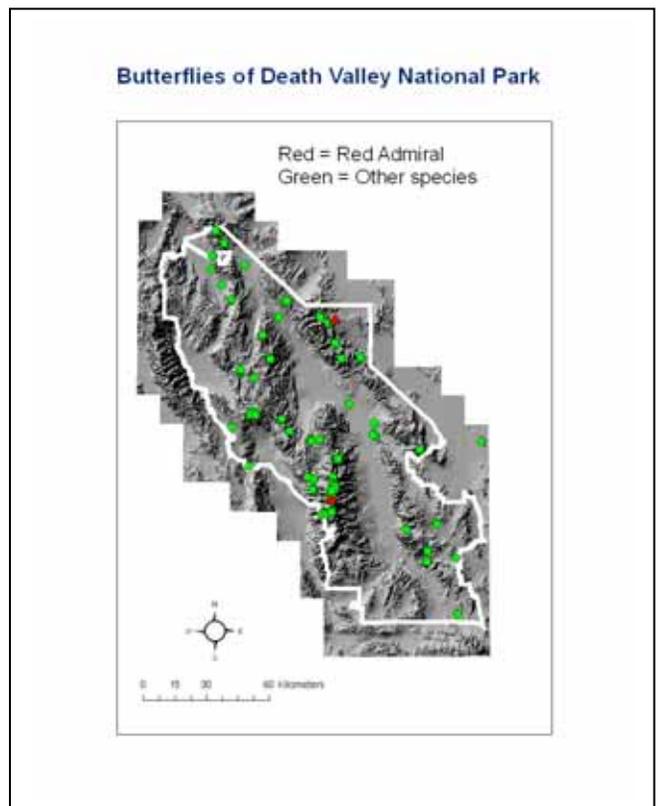


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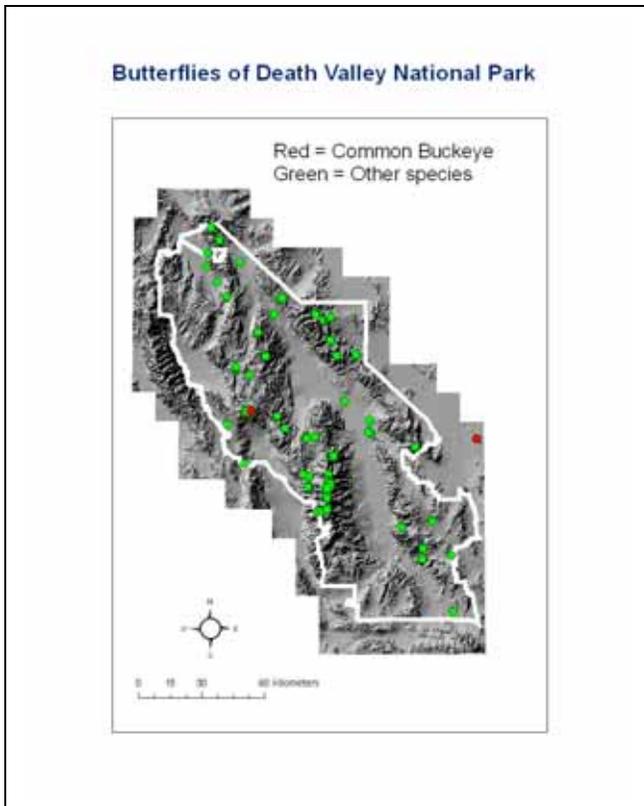


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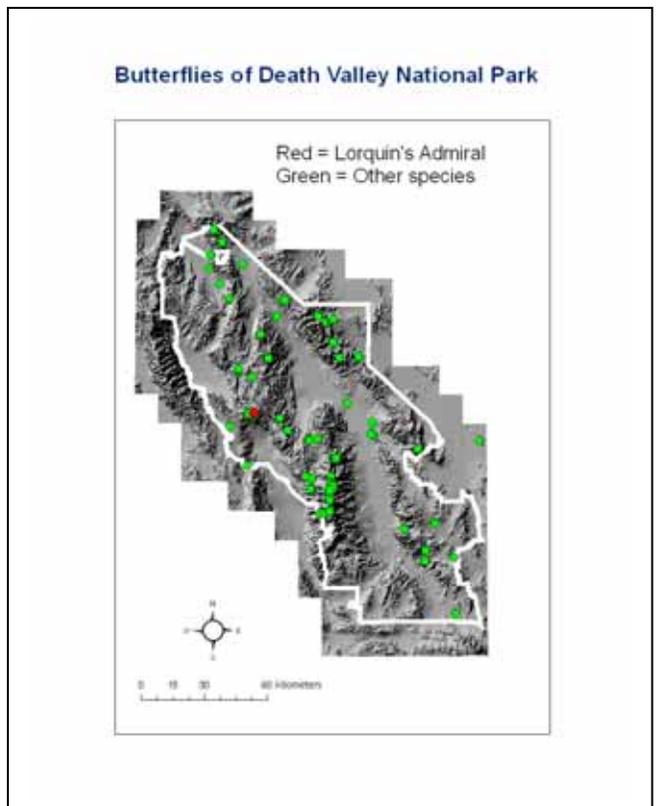


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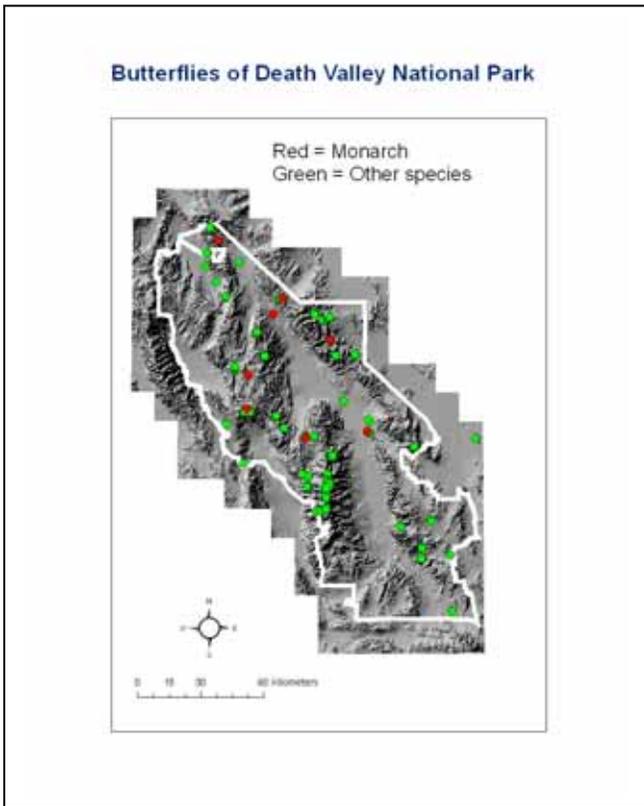


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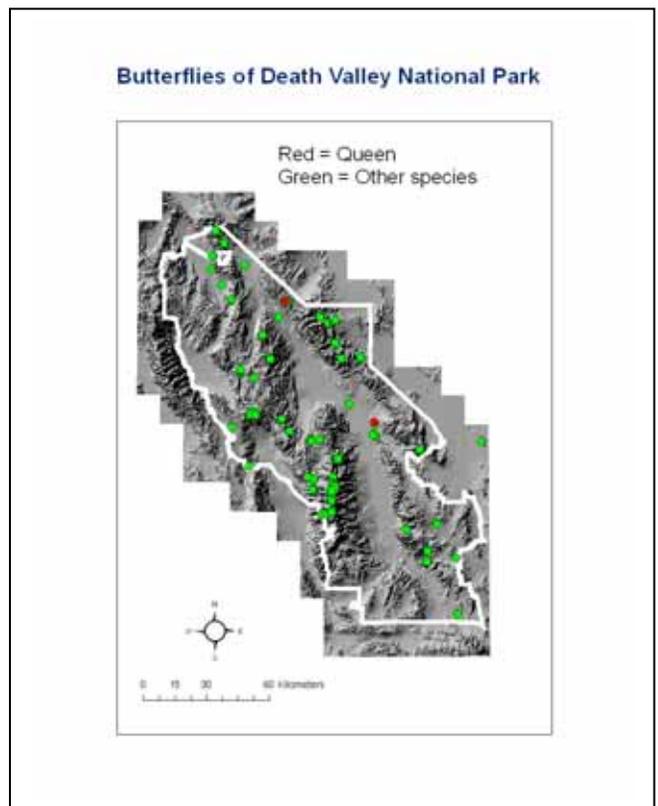


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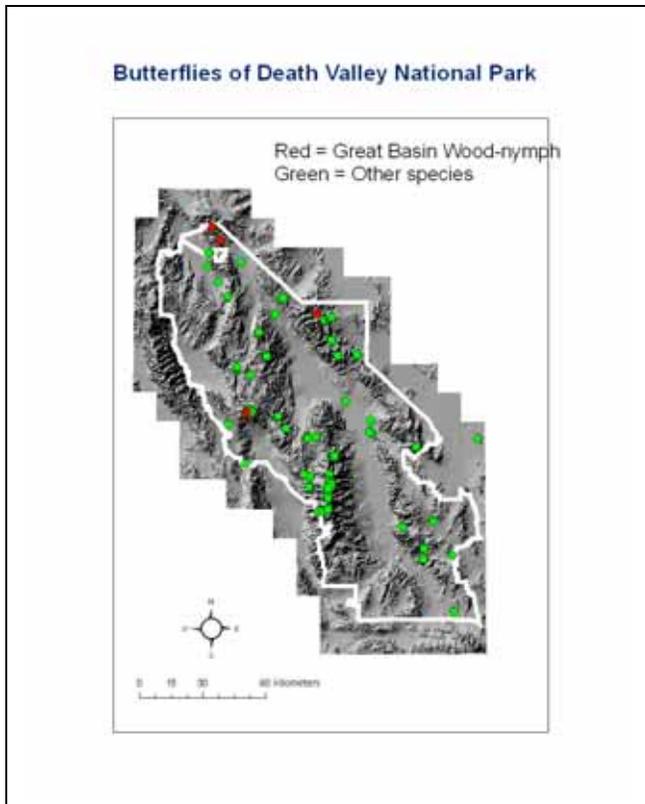


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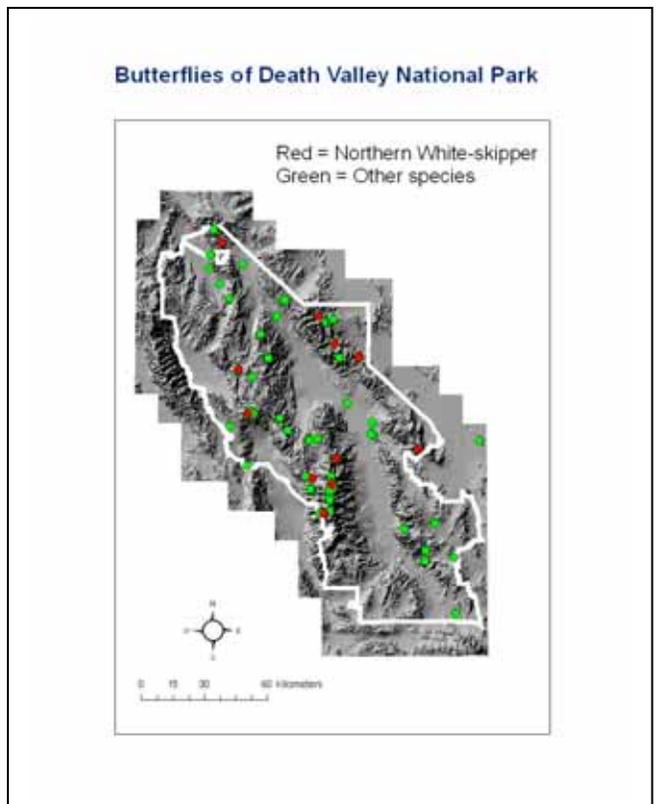


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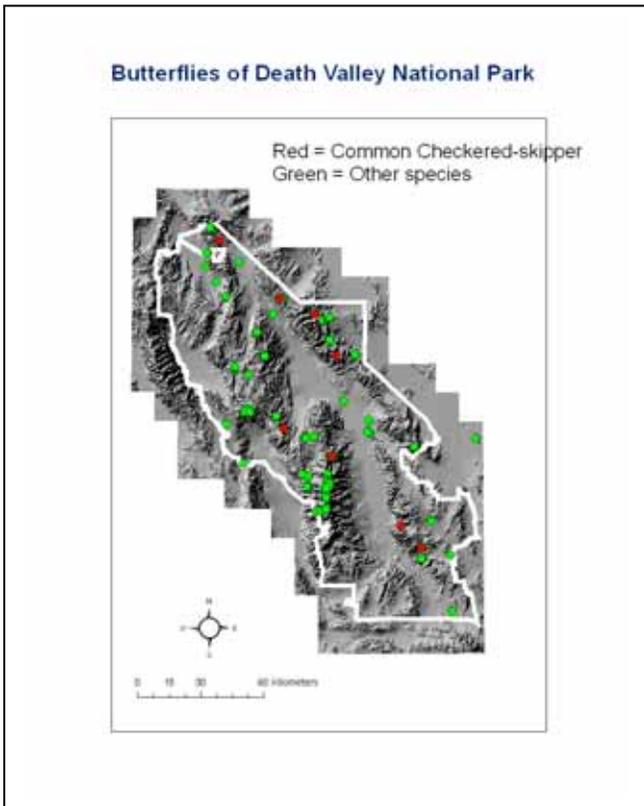


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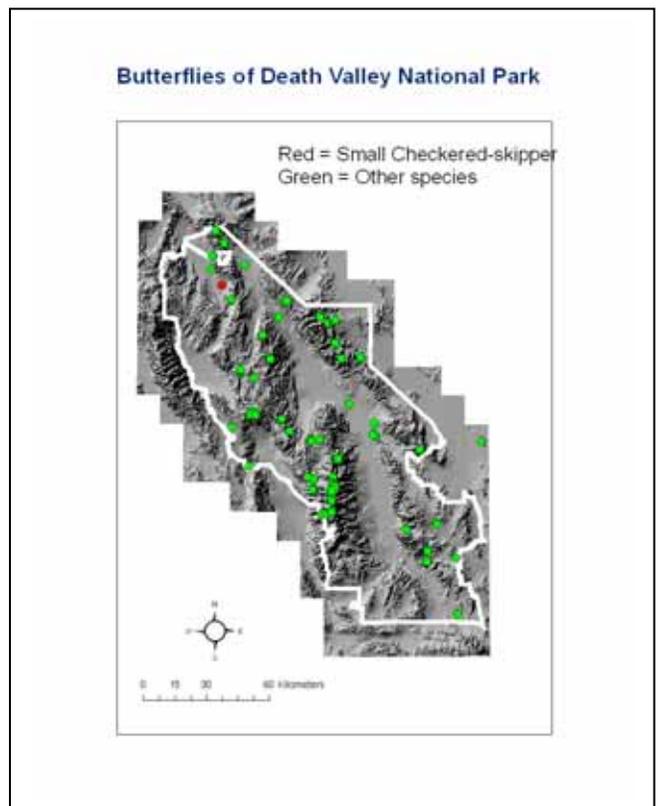


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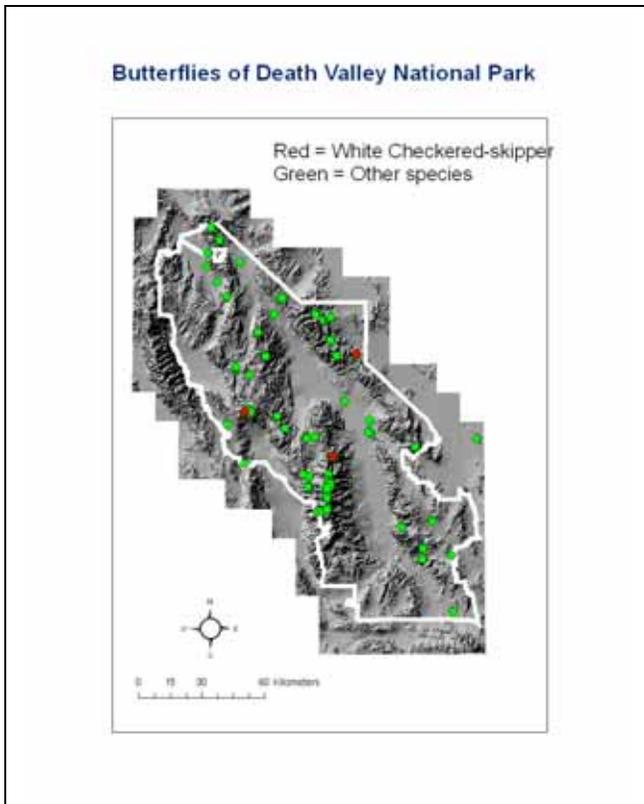


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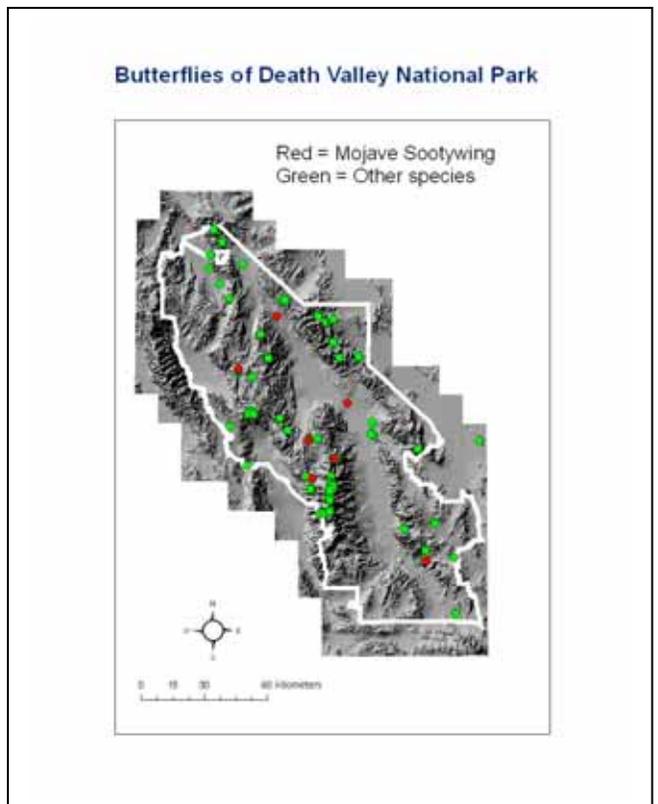


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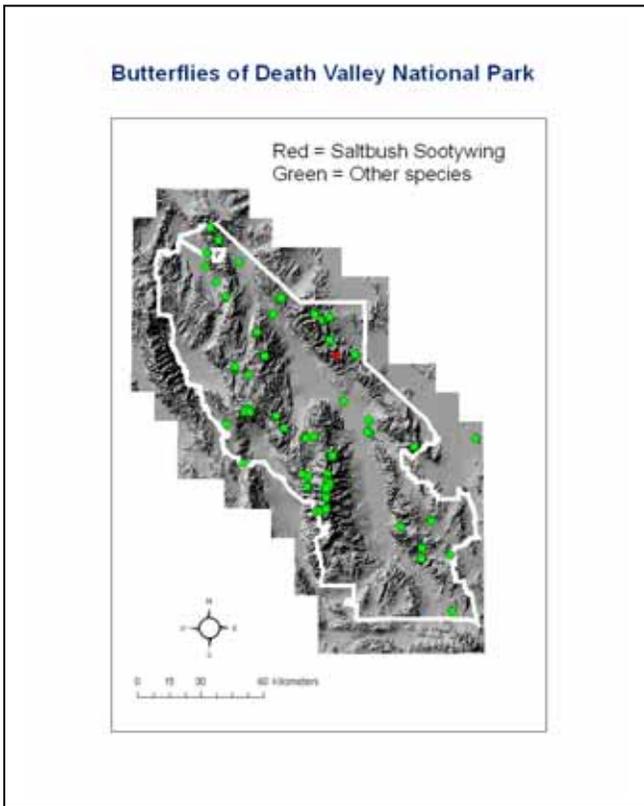


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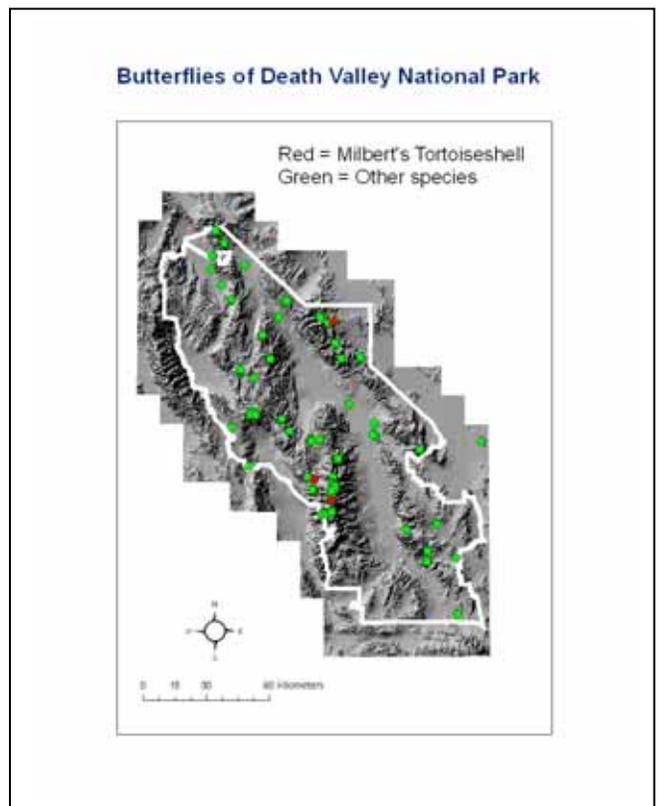


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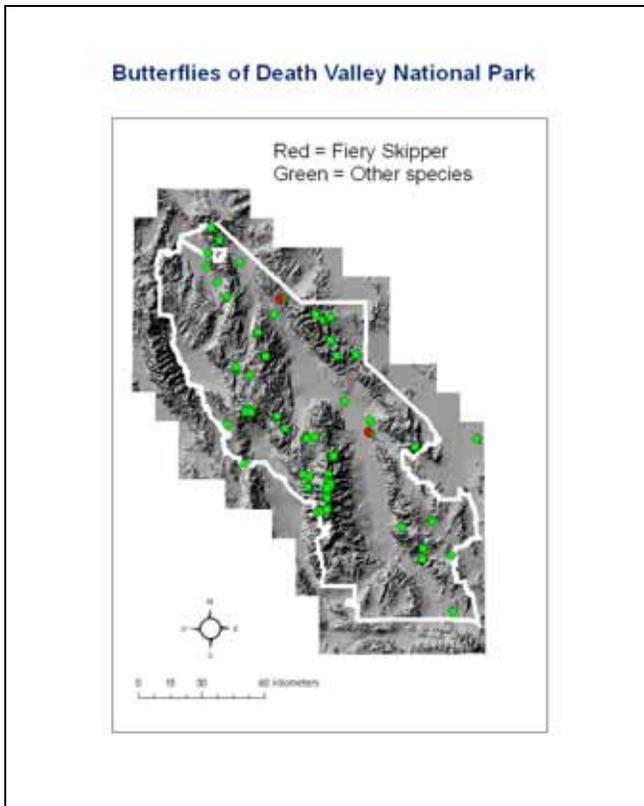


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Figure 66

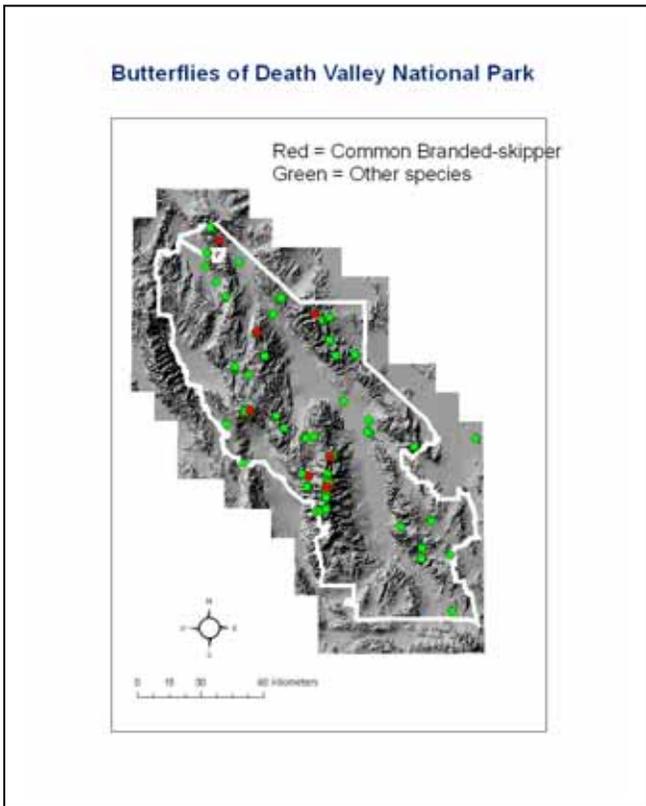


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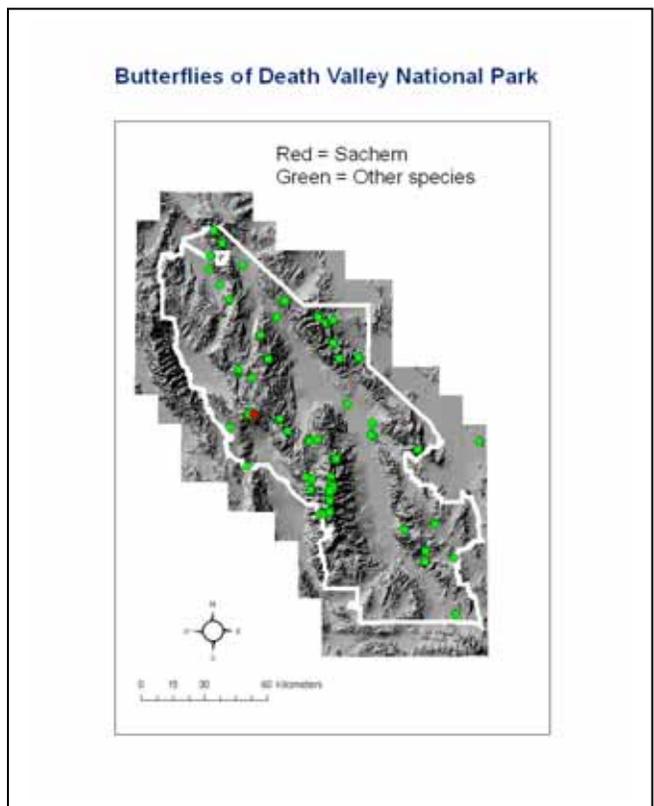


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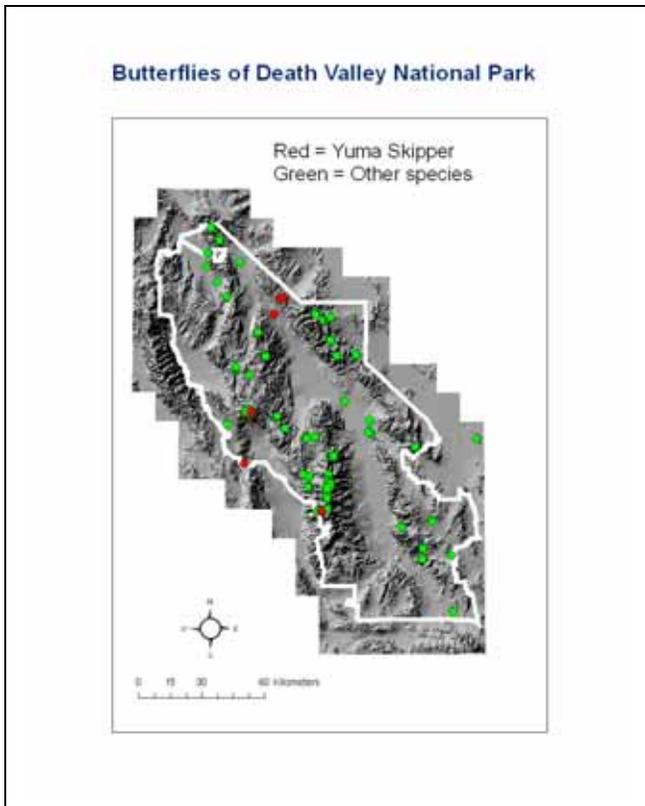


Figure 69



Figure 70

This data indicates that the most abundant butterfly species within the park include the following species: square-spotted blue, sagebrush checkerspot, indra swallowtail, western pygmy-blue, checkered white and Becker's white. The least abundant butterfly species appears to be: Sara orangetip, California dogface, sooty hairstreak, American lady, small checkered-skipper and saltbush sootywing. Besides abundance, the most widely distributed (within the park) butterfly species appears to include the following: sagebrush checkerspot, Becker's white, western pygmy-blue, checkered white, square-spotted blue, indra swallowtail, pearly marble, orange, sulphur, and marine blue.

Other distribution trends, such as regional distribution, are also indicated. For instance, the western pine elfin (Figure 24), juniper hairstreak (Figure 26), spring azure (Figure 33), Boisduval's blue (Figure 38), lupine blue (Figure 40), northern checkerspot (Figure 43) and California tortoiseshell (Figure 46) populations appear to mostly be isolated to the Panamint Range. Some of these populations may even represent currently unknown, genetically distinct subspecies. There is much to be answered by further investigations into the butterflies of Death Valley National Park.

Butterfly populations are not only influenced by climate, habitat conditions, and other site specific variables, they are also influenced by direct harm. Butterfly conservation in this park and elsewhere will help ensure the continued enjoyment of these fascinating creatures. Unfortunately, Death Valley National Park has had large-scale illegal commercial butterfly collectors in the past. Some have been caught and sentenced to jail and have faced stiff fines. Remember, specimen collecting within the park, for personal or commercial use, is prohibited, unless it is part of an approved research project and in possession of a valid National Park Service research permit. Handling butterflies or other wildlife is also not permitted. Butterflies in the park are best appreciated with the aid of binoculars or a camera. Please no nets or other capturing devices. Thank you for your interest in the resources of Death Valley National Park.

The intent is for this inventory and list be updated on an as-need basis, based upon the availability of new information, but at least once a year. Please help the staff at Death Valley by reporting butterfly sightings and taking an interest in the tremendous diversity of resources available for research and enjoyment within Death Valley National Park.

Potential Butterfly Species within Death Valley National Park

Since the list of butterfly species within Death Valley National Park, listed above, is not a complete list of all butterfly species within the park, there is still a high probability that additional species do occur within the park but have yet been verified. Listed below are some of these possible butterfly species. This list of potential butterfly species within the park should not be considered a complete list of all potential unrecorded butterfly species within the park, but instead represents species whose range is close to the park and therefore have perhaps a higher probability of also occurring within the park. Please keep a close watch for these and other un-recorded species within the park. Please send any notes and updates to the park, attention David A. Ek. Thank you!

Papilionidae

Battus philenor **Pipevine Swallowtail**

Papilio machaon **Old World Swallowtail**

Papilio rutulus **Western Tiger Swallowtail**

Confirmed in nearby Spring Mountains (Ek, 2007)

Pieridae

Neophasia menapia **Pine White**

Colias philodice **Clouded Sulphur**

Colias alexandra **Queen Alexandra's Sulphur**

Phoebis sennae **Cloudless Sulphur**

Eurema mexicana **Mexican Yellow**

Lycaenidae

Lycaena helloides **Purplish Copper**

Atlides halesus **Great Purple Hairstreak**

Ministrymon leda **Leda Ministreak**

Glaucopsyche piasus **Arrowhead Blue**

Lycaeides melissa **Melissa Blue**

Plebejus shasta **Shasta Blue**

Confirmed in nearby Ash Meadows NWR (Ek, 2007)

Riodinidae

Calephelis nemesis **Fatal Metalmark**

Calephelis wrighti **Wright's Metalmark**

Apodemia palmeri **Palmer's Metalmark**

Confirmed in nearby Ash Meadows NWR (Ek, 2007)

Nymphalidae

Libytheana carinenta **American Snout**

Euptoieta claudia **Variiegated Fritillary**

Chlosyne californica **California Patch**

Chlosyne lacinia **Bordered Patch**

Euphydryas chalcedona **Variable Checkerspot**

Unverified observation at Furnace Creek Inn (Ek, 2007)

Polygonia satyrus **Satyr Comma**

Polygonia gracilis **Hoary Comma**

Junonia genoveva **Tropical Buckeye**

Limenitis weidemeyerii **Weidemeyer's Admiral**

Adelpha bredowii **California Sister**

Coenonympha tullia **Common Ringlet**

E. chalcedona photo supposedly taken from park (Cook, 1989)

Hesperiidae

Erynnis brizo **Sleepy Duskywing**

Erynnis funeralis **Funereal Duskywing**

Erynnis persius **Persius Duskywing**

Pholisora catullus **Common Sootywing**

Pseudocopaeodes eunus **Alkali Skipper**

Hesperia pahaska **Pahaska Skipper**

Polites sabuleti **Sandhill Skipper**

Lerodea eufala **Eufala Skipper**

Agathymus alliae **Mojave Giant-skipper**

Total = 38

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APPENDIX

Checklist of Butterfly Species Documented within Death Valley National Park

Papilionidae

Papilioninae

- _____ *Papilio polyxenes* **Black Swallowtail**
- _____ *Papilio indra* **Indra Swallowtail**

Pieridae

Pierinae

- _____ *Pontia beckerii* **Becker's White**
- _____ *Pontia sisymbrii* **Spring White**
- _____ *Pontia protodice* **Checkered White**
- _____ *Pieris rapae* **Cabbage White**
- _____ *Euchloe hyantis* **Pearly Marble**
- _____ *Anthocharis cethura* **Desert Orangetip**
- _____ *Anthocharis sara* **Sara Orangetip**

Coliadinae

- _____ *Colias eurytheme* **Orange Sulphur**
- _____ *Colias cesonia* **California Dogface**
- _____ *Eurema nicippe* **Sleepy Orange**
- _____ *Nathalis iole* **Dainty Sulphur**

Lycaenidae

Lycaeninae

- _____ *Lycaena arota* **Tailed Copper**
- _____ *Lycaena xanthoides* **Great Copper**

Theclinae

- _____ *Satyrium behrii* **Behr's Hairstreak**
- _____ *Satyrium fulginosa* **Sooty Hairstreak**
- _____ *Satyrium sylvinus* **Sylvan Hairstreak**
- _____ *Satyrium saepium* **Hedgerow Hairstreak**
- _____ *Callophrys sheridanii* **Sheridan's Hairstreak**
- _____ *Callophrys fotis* **Desert Elfin**
- _____ *Callophrys eryphon* **Western Pine Elfin**
- _____ *Callophrys spinetorum* **Thicket Hairstreak**
- _____ *Callophrys gryneus* **Juniper Hairstreak**
- _____ *Strymon melinus* **Gray Hairstreak**

Polyommatainae

- _____ *Brephidium exile* **Western Pygmy-blue**
- _____ *Leptotes marina* **Marine Blue**
- _____ *Hemiargus ceraunus* **Ceraunus Blue**
- _____ *Hemiargus isola* **Reakirt's Blue**
- _____ *Everes amyntula* **Western Tailed-blue**
- _____ *Celastrina ladon* **Spring Azure**
- _____ *Euphilotes battoides* **Square-spotted Blue**
- _____ *Euphilotes enoptes* **Dotted Blue**
- _____ *Philotiella speciosa* **Small Blue**
- _____ *Glaucopsyche lygdamus* **Silvery Blue**
- _____ *Plebejus icarioides* **Boisduval's Blue**
- _____ *Plebejus acmon* **Acmon Blue**
- _____ *Plebejus lupini* **Lupine Blue**

Riodinidae

Riodininae

- _____ *Apodemia mormo* **Mormon Metalmark**

Nymphalidae

Nymphalinae

- ___ *Thessalia leanira* **Leanira Checkerspot**
- ___ *Chlosyne palla* **Northern Checkerspot**
- ___ *Chlosyne acastus* **Sagebrush Checkerspot**
- ___ *Phyciodes mylitta* **Mylitta Crescent**
- ___ *Nymphalis californica* **California Tortoiseshell**
- ___ *Nymphalis antiopa* **Mourning Cloak**
- ___ *Nymphalis milberti* **Milbert's Tortoiseshell**
- ___ *Vanessa virginiensis* **American Lady**
- ___ *Vanessa cardui* **Painted Lady**
- ___ *Vanessa annabella* **West Coast Lady**
- ___ *Vanessa atlanta* **Red Admiral**
- ___ *Junonia coenia* **Common Buckeye**

Limenitidinae

- ___ *Limenitis lorquini* **Lorquin's Admiral**

Danainae

- ___ *Danaus plexippus* **Monarch**
- ___ *Danaus gilippus* **Queen**

Satyrinae

- ___ *Cercyonis sthenele* **Great Basin Wood-nymph**

Hesperiidae

Pyrginae

- ___ *Heliopetes ericetorum* **Northern White-skipper**
- ___ *Pyrgus communis* **Common Checkered Skipper**
- ___ *Pyrgus scriptura* **Small Checkered-skipper**
- ___ *Pyrgus albescens* **White Checkered-skipper**
- ___ *Hesperopsis libya* **Mojave Sootywing**
- ___ *Hesperopsis alpheus* **Saltbush Sootywing**

Hesperiinae

- ___ *Copaeodes aurantiaca* **Orange Skipperling**
- ___ *Hylephila phyleus* **Fiery Skipper**
- ___ *Hesperia juba* **Juba Skipper**
- ___ *Hesperia comma* **Common Branded-skipper**
- ___ *Atalopedes campestris* **Sachem**
- ___ *Ochlodes yuma* **Yuma Skipper**

Megathyminae

- ___ *Megathymus yuccae* **Yucca Giant-skipper**