PETITION TO LIST
TEN GREAT BASIN BUTTERFLIES
UNDER THE U.S. ENDANGERED SPECIES ACT

Carson Valley silverspot butterfly ♂ Photo: Monte Sanford ©

Petition Submitted to the U.S. Secretary of Interior
Acting through the U.S. Fish and Wildlife Service

Petitioner:
WildEarth Guardians
312 Montezuma Avenue
Santa Fe, New Mexico 87501
(505) 988-9126

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WildEarth Guardians
A FORCE FOR NATURE

I. Summary

The many, varied habitats in the Great Basin of the western United States are home to a vast diversity of flora and fauna, including many endemic species. Speciation and endemism in butterflies is unusually high in the region: there are more than 200 species—and 700 subspecies—of butterflies in Nevada alone.

Unfortunately, many butterflies in the Great Basin are imperiled, mirroring trends elsewhere (New 1997). Butterfly populations and habitat are affected by natural events and myriad human activities (New 1997, Hoffman Black and Vaughan 2003). Many butterfly species need active conservation if they are to persist into the future (New 1997).

WildEarth Guardians petitions the U.S. Fish and Wildlife Service (Service) to list ten Great Basin butterflies under the Endangered Species Act. Each of these butterflies specializes in or is restricted to limited habitats that are threatened by land uses and other factors. Listing them as "endangered" or "threatened" under the Endangered Species Act would help conserve petitioned butterflies and protect their habitat (Hoffman Black and Vaughan 2003).

II. The Great Basin

The Great Basin is one of the most rugged and beautiful regions in the United States. It is a semi-arid closed basin that includes most of the state of Nevada, and parts of California, Oregon, Idaho and Utah (Chambers et al. 2008). Much of the region is basin and range country, where long, steep ridges of volcanic uplift and fault-block mountains flank broad valleys.

The Great Basin's huge size, varied topography, remarkable geology and climate create a multitude of habitat types. The region features mountainous forests, rolling hills of sagebrush and aspen, rocky outcroppings, lakes, rivers, streams, springs and wetlands, hot springs, playas, dunes, and alkali flats. The many and varied habitat types support significant species diversity and endemism. Nevada, which contains most of the Great Basin, enjoys incredible biodiversity. Only ten states reportedly have greater biodiversity than Nevada, and even fewer have so many endemic species (NNHP 2006).

Unfortunately, the Great Basin has been ravaged in the last 150 years and the region is now considered one of the most imperiled landscapes in the United States (Chambers et al. 2008). Myriad land uses and related effects have destroyed, degraded and fragmented Great Basin habitats, reducing connectivity, blocking corridors and isolating sensitive species. Nearly 16 percent of species in Nevada are in danger of extinction and thirteen endemic species in Nevada are known to have already gone extinct (NNHP 2006: 3).[1]

Many species dependent on aquatic or mesic habitats in the Great Basin are of particular concern (*see* NNHP 2006). Meadows, marshes, ponds, ephemeral pools, alkali flats, seeps and springs are among the most fragile—and degraded—habitat types in the Great Basin. Many wetlands have already been lost in the region (Brussard et al. 1998). The Nevada Natural Heritage Program

[1] Sada and Vinyard (2002: 280) reported that sixteen taxa associated with aquatic ecosystems in the Great Basin have become extinct since the 1800s (12 fishes, 3 mollusks, 1 aquatic insect).

(2008) identified invasive species (plants and animals), livestock grazing, water diversion and development, and channel modification as the most important threats to 234 remaining "priority wetland areas" in the state.

The Great Basin faces a difficult future. Chambers et al. (2008: 1) summarized:

> The population is expanding at the highest rate in the nation, and major sociological and ecological changes are occurring across the region. These changes can be attributed to numerous interacting factors including urbanization, changing land use, climate change, limited water resources, altered fire regimes, invasive species, insects, and disease. The consequences have been large-scale vegetation type conversions, loss of watershed function, and degradation of stream, riparian, and aquatic ecosystems.

These straining conditions will further endanger imperiled butterflies in the Great Basin and complicate their conservation and recovery. Invertebrates, particularly those dependent on isolated and shrinking habitats, are extremely susceptible to habitat modification and perturbations in microclimate (Brussard et al. 1998). Many invertebrates specialize in niche habitats—they may not be able to adapt to habitat changes, nor move to other areas when current habitat becomes unsuitable. Further, reestablishing extirpated populations of specially adapted invertebrates becomes less probable on altered or degraded habitat (Brussard et al. 1998).

Conservation and habitat protection are key to protecting sensitive invertebrate species. Unfortunately, a majority of the most imperiled species in Nevada are poorly represented in reserve areas, with 55 percent having less than 25 percent of known occurrences found in reserves (Greenwald and Bradley 2008). Reserves cover 14 percent of the state (Greenwald and Bradley 2008), but often miss key microhabitats important to narrowly adapted and/or endemic species. Even concentrations of imperiled species at many biological "hot spots" are largely unprotected (Greenwald and Bradley 2008). Imperiled species that lack sufficient regulatory protection, particularly habitat conservation, should be listed under the Endangered Species Act.

II. Endangered Species Act and Implementing Regulations

The Endangered Species Act of 1973 (ESA) protects plants and animals that are listed by the federal government as “endangered” or “threatened” (16 U.S.C. § 1531 et seq.). Any interested person may submit a written petition to the Secretary of the Interior requesting him to list a species as “endangered” or “threatened” under the ESA (50 C.F.R. § 424.14(a)). An “endangered species” is “any species that is in danger of extinction throughout all or a significant portion of its range” (16 U.S.C. § 1532(6)). A “threatened species” is defined as “any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range” (16 U.S.C § 1532(20)). “Species” includes subspecies and distinct population segments of sensitive taxa (16 U.S.C § 1532(16)).

The ESA sets forth listing factors under which a species can qualify for protection (16 U.S.C. § 1533(a)(1)):

A. The present or threatened destruction, modification, or curtailment of habitat or range;
B. Overutilization for commercial, recreational, scientific, or educational purposes;
C. Disease or predation;
D. The inadequacy of existing regulatory mechanisms; or
E. Other natural or manmade factors affecting its continued existence.

A taxon need only meet one of the listing criteria outlined in the ESA to qualify for federal listing.

III. Great Basin Butterflies Petitioned for Listing under the Endangered Species Act

WildEarth Guardians petitions to list ten butterflies as "threatened" or "endangered" under the Endangered Species Act:

Baking Powder Flat blue butterfly
Euphilotes bernardino minuta

Bleached sandhill skipper
Polites sabuleti sinemaculata

Carson Valley silverspot
Speyeria nokomis carsonensis

Carson Valley wood nymph
Cercyonis pegala carsonensis

Mattoni's Blue Butterfly
Euphilotes pallescens mattonii

Mono Basin Skipper
Hesperia uncas giulianii

Railroad Valley Skipper
Hesperia uncas fulvapalla

Railroad Valley skipper
Hesperia uncas reeseorum

Steptoe Valley crescentspot
Phyciodes cocyta arenacolor

White River Valley skipper
Hesperia uncas grandiosa

These local and endemic butterflies specialize in and/or are restricted to small habitat patches in the Great Basin (see Map 1). NatureServe ranks all of the butterflies globally and/or nationally, and within the state of Nevada, as "critically imperiled" (i.e., G1, N1, S1) or "imperiled" (i.e., G2, N2, S2). NatureServe's definitions of "critically imperiled" and "imperiled are at least equivalent to definitions of "endangered" or "threatened" under the ESA.

Critically Imperiled **--** At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.

Imperiled -- At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.

Furthermore, the factors considered by NatureServe in ranking species also overlap with the ESA's listing factors listed above.

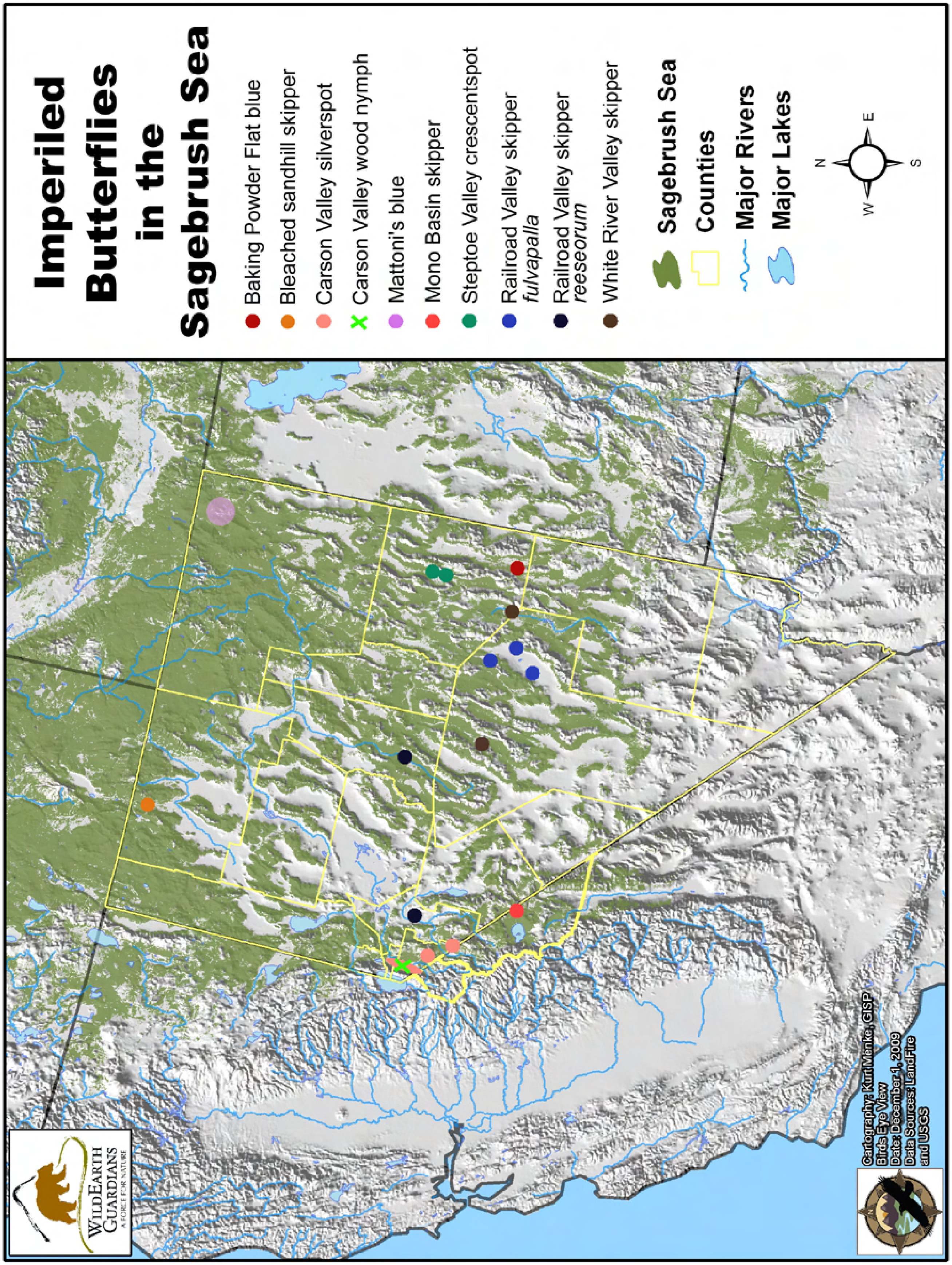
The Service currently lists all but one of the petitioned butterflies as “species of concern,” which are “species that are declining” and “might be in need of conservation action,” including possible listing under the ESA. The Bureau of Land Management (BLM) also lists many of the butterflies as “sensitive species” in Nevada. The designation includes “species that could easily become endangered or extinct in the state.”

Table 1. Imperiled Butterflies Petitioned for Listing under the Endangered Species Act

Species	NatureServe Global Rank	NatureServe National Rank	NatureServe State Ranks	BLM Sensitive Species	FWS Species of Concern
Baking Powder Flat blue butterfly	1*	1	NV (1)		
Bleached sandhill skipper	1*	1	NV (1)	NV	✓
Carson Valley silverspot	1*	1	CA (1), NV (1)	NV	✓
Carson Valley wood nymph	2*	2	CA (1-2), NV (2)	NV	✓
Mattoni’s blue butterfly	1*	1	NV (1)	NV	✓
Mono Basin skipper	1*	1	NV (1)		✓
Railroad Valley skipper (*fulvapalla*)	1*	1	NV (1)	NV	✓
Railroad Valley skipper (*reeseorum*)	1*†	1 or 2	NV (1)		✓
Steptoe Valley crescentspot	1*	1	NV (1)	NV	✓
White River Valley skipper	1*	1	NV (1)		✓

* NatureServe ranks the subspecies as more imperiled than the full species.
† Rounded rank.

Map 1



Imperiled Butterflies in the Sagebrush Sea
Baking Powder Flat blue
Bleached sandhill skipper
Carson Valley silverspot
Carson Valley wood nymph
Mattoni's blue
Mono Basin skipper
Steptoe Valley crescentspot
Railroad Valley skipper *fulvapalla*
Railroad Valley skipper *reeseorum*
White River Valley skipper
Sagebrush Sea
Counties
Major Rivers
Major Lakes
N
E
S
W
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Cartography: Kurt Menke, GISP
Birds Eye View
Date: December 1, 2009
Data Sources: LandFire and USGS

A. Threats to Great Basin Butterflies

Many of the petitioned butterflies occur in areas threatened by the same land uses, habitat alteration, and other factors. All of them may be vulnerable to effects related to limited range and small population size. These common threats are addressed here, organized by ESA listing factor.

A. Present or threatened destruction, modification, or curtailment of habitat or range.

Water Development. Mismanagement and overuse of surface- and groundwater has reduced and degraded riparian and aquatic habitats in the Great Basin (Sada 2008, Sada et al. 1992). Wetlands were reduced by 52 percent in Nevada between the 1780s and 1980s (Noss et al. 1995, *citing* Dahl 1990). Seeps and springs are degraded and destroyed by grazing, (gold) mining, pollution, water diversion and other factors in the Great Basin (Sada 2008, Sada et al. 2001, Brussard et al. 1998). Most springs—76 percent—observed on BLM land in northern Nevada were highly or moderately disturbed by livestock grazing and water diversion (Sada et al. 1992). The historic range for some petitioned butterflies was likely reduced from mismanagement and loss of mesic habitat in the Great Basin.

Now water development—especially enormous groundwater pumping projects proposed in southern, central and eastern Nevada—threaten to lower aquifers and dewater entire sub-basins, which would reduce or eliminate seeps and springs, wetlands and associated habitat (Deacon et al. 2007 and others).

Explosive population growth in Las Vegas and other communities in Nevada has increased demand for additional water supplies. Current proposals by the Southern Nevada Water Authority would pump up to 180,800 acre-feet of groundwater per year from southern, central and eastern Nevada and pipe it to Las Vegas Valley (Deacon et al. 2007). Outlying communities are pursuing rights to an additional 870,487 acre-feet of water per year for development and agriculture (Deacon et al. 2007). Proposed groundwater withdrawal could cause a greater reduction in water tables in the next 100 years than occurred in the 15,000 years after glaciers receded from the Great Basin (Schlyer 2007, unpublished report: 7, *citing* J. Deacon).

Riparian zones, wetlands, wet meadows and related habitats, though they comprise only a small fraction (~1 percent) of the land surface, are critically important to native and endemic species in the Great Basin (Brussard et al. 1998). Butterfly diversity is greater in these small, wet, lowland sites than in other, more xeric habitat types (Austin 1992). Wet areas are usually isolated within subbasins, separated by mountain ranges and/or large expanses of sagebrush steppe, which has accelerated speciation and specialization in butterflies (Austin 1992). Some of the butterflies petitioned here depend on meadows or other mesic habitats maintained by consistent, reliable freshwater springs.[2]

Groundwater pumping disrupts the equilibrium between aquifer recharge and spring discharge. Continuous pumping of the annual recharge "virtually guarantee[s] equivalent reductions in natural discharge" (Deacon et al. 2007: 690, citing Dettinger et al. 1995). There is a strong correlation among water table levels, soil moisture, and species occurrence (Sanford 2006).

[2] Some springs supplied by deeper aquifers emerge as warm ("hot") springs (Deacon et al. 2007).

Groundwater pumping has already dewatered many springs in southern Nevada, causing extirpation and extinction of endemic species (Deacon et al. 2007).

Proposed groundwater pumping in southern, central and eastern Nevada will lower water tables between just a few feet to several hundred feet (Deacon et al. 2007, Schaefer and Harrill 1995, Myers 2006). A drawdown of as little as 1 foot can affect aquifer spring discharge (Myers 2006). Proposed pumping in the Great Basin is estimated to reduce spring flow between 2 to 14 percent in the first 100 years (Deacon et al. 2007). Local and regional groundwater withdrawal is expected to reduce spring outflow and associated wetlands and transitional habitats in the Great Basin (Patten et al. 2007), which could affect hundreds of sensitive species (Deacon 2009, newsletter).

Local groundwater withdrawal is identified as a potential threat to the Carson wandering skipper (*Pseudocopaeodes eunus obscurus*), an endangered butterfly that occurs in the Carson Valley in western Nevada (Sanford 2006). It is feared that local pumping will dry out saltgrass habitat used by the skipper (Sanford 2006), leaving little remaining suitable habitat in the valley. Two subspecies petitioned here also occur in the Carson Valley: the Carson Valley silverspot and Carson Valley wood nymph. Other petitioned butterflies also depend on spring-fed habitats, including the Bleached sandhill skipper and the Steptoe Valley crescentspot.

Livestock Grazing. The effects of livestock grazing on riparian zones, wetlands, seeps and springs in the West are well known. Grazing removes native vegetation, reducing cover, biomass, and productivity of herbaceous and woody species; trampling by livestock destroys vegetation, increases runoff, compacts soil and accelerates erosion; grazing also facilitates the spread of nonnative plants (Belsky et al. 1999, Fleishner 1994, Sada et al. 2001). Water diversion and development of springs to water livestock also eliminates spring-fed habitats (Sada et al. 2001). Although light or moderate grazing can help maintain some butterfly habitat types (TNC 2008), heavy grazing is considered incompatible with conserving butterflies in the Great Basin (*e.g., see* Selby 2007), in the Carson Valley in Nevada (Sanford 2006), and threatens some butterflies petitioned here, including the Baking Powder Flat blue, Carson Valley silverspot, Carson Valley wood nymph, and Mono Basin skipper.

Agriculture. Artificial riparian habitats created by agriculture (i.e., irrigated cropland) were found to support fewer butterfly species (if also a greater abundance of butterflies) than native habitats (Fleishman et al. 1999). Most of the individuals censused at agricultural sites were vagile, widespread, generalist species and are often found on disturbed habitats (Fleishman et al. 1999). Less common and/or less vagile species were less likely to be found at agricultural sites (Fleishman et al. 1999). Also, uncommon species that specialize in native larval hostplants were not found at agricultural sites (Fleishman et al. 1999). While some forms of agriculture can preserve open space and support some butterfly species, these artificial habitats cannot replace natural, undisturbed ecosystems (Fleishman et al. 1999).

Herbicides/Insecticides. Herbicide application (including unintended herbicide drift) can degrade butterfly habitat by killing butterfly host- and nectaring plants (Selby 2007). This threat is more serious for butterfly species and subspecies that specialize in one hostplant. Indiscriminant use of insecticides on pastureland or adjacent cropland can also be an important threat to butterflies (Selby 2007).

B. Overutilization for commercial, recreational, scientific, or educational purposes.

While individuals of all of the petitioned butterflies have been collected by scientists and amateur collectors for many years, it is not known whether collection constitutes a threat to any of these butterflies as a whole. NatureServe indicated that specimens would be needed to document new occurrences of butterflies, but that they should be restrictively collected. The Service should investigate whether collecting is a threat in the course of a full status review for the petitioned butterflies.

C. Disease or predation.

Disease is not known to be a threat to the petitioned butterflies. Larvae and adult butterflies are subject to predation by a wide variety of vertebrate and invertebrate wildlife (e.g., birds, herptiles, other insects). However, it is not known whether predation constitutes a threat to any of these butterflies as a whole.

D. Inadequacy of existing regulatory mechanisms.

There is no federal or state program charged with managing sensitive invertebrates in Nevada or the Great Basin. Nevada state law only protects species that the state Wildlife Commission has specifically determined to be imperiled (Nev. Rev. Stat. 503.584 – 503.589)**.** Protected species may include mollusks and crustaceans, but apparently not other invertebrates (Nev. Rev. Stat. 501.110)—no butterfly is protected under the statute.

The Nevada Wildlife Action Plan does not prescribe conservation measures for sensitive butterflies in the state, and noted that "there has been very little state focus on the conservation of rare insects beyond participation in management strategy development for endangered butterflies which as a result of their federal listing have become the primary responsibility of the [U.S. Fish and Wildlife Service]" (WAPT 2006: 62). Some petitioned butterflies may occur at "preliminary focal areas" identified in the Wildlife Action Plan, but it is unclear what regulatory authority, if any, the state has to affect management in these areas.

Federal conservation efforts, such as the Great Basin Restoration Initiative, have struggled to deal with major problems facing the region. New management direction and millions of dollars will be necessary to reverse negative environmental trends in the Great Basin. Unfortunately, Chambers et al. (2008) noted that both research and management activities have been "severely" under-funded in the region.

E. Other natural or manmade factors affecting a species' continued existence.

Drought. Much of the Great Basin is an arid and hot landscape (in summer). Potential evapotranspiration exceeds annual precipitation by a factor of over 5 in some parts of the region (West 1983: 344, *citing* Major 1963). Drought, though a natural phenomenon, speeds evapotranspiration and could negatively affect riparian habitats, moist meadows, and similar habitats, particularly those already stressed by other factors. Droughts may become even more common in the Great Basin as climate change alters future precipitation (Chambers et al. 2008, Seager et al. 2007).

Climate Change. Average temperature has increased 0.6-1.1° F in the last 100 years in the Great Basin (Chambers 2008a). Raupach et al. (2007) discovered that the growth rate in anthropogenic CO_2 emissions increased more rapidly between 2000 and 2004 than even predicted by the highest growth rate (i.e., "worst case") scenario developed by a leading intergovernmental organization in the late 1990s. Drought may also contribute to increased atmospheric CO_2 by reducing the amount of CO_2 that is annually taken up by terrestrial vegetation (Peters et al. 2007). Increased CO_2 may favor invasive, annual grasses, including cheatgrass (*Bromus tectorum*) (Smith et al. 2000). Cheatgrass is believed to be adapting to salt flats, wet meadows and other habitat types that petitioned butterflies use.

Climate change has and will continue to affect hydrology and ecosystems in the American West. Up to 60 percent of the climate-related trends in river flow, winter air temperature and snow pack between 1950-1999 were influenced by human-induced climate change (Barnett et al. 2008). Climate change is already reducing snowpack in the West (Mote et al. 2005), expediting snow melt in spring and appears to be affecting the bloom-date of some plants in the Great Basin (Chambers 2008b, Stewart et al. 2005). Climate change is expected to affect the timing and flow from streams, springs and seeps in the Great Basin (Sada 2008, Chambers 2008a), which support the moist meadows on which some imperiled butterflies depend.

Climate change is projected to cause temperatures to continue to increase in the Great Basin by 3-4° F in spring and autumn, and by 5-6° F in winter and summer, by 2100 (Chambers 2008a, *citing* Cubashi et al. 2001). Any stabilization or cooling trend in average temperatures is expected to be temporary (Kerr 2008). Climate change is not a temporary or stochastic occurrence; it will cause permanent changes to Great Basin ecosystems.

Increased levels of CO2 and increased temperatures have myriad effects on plant growth and chemistry, which may affect insect persistence and abundance (Stiling 2003). Climate change could affect bloom phenology in butterfly hostplants, disrupting butterfly use of those plants and/or force the insects to either evolve to accommodate earlier bloom periods or switch to other hostplants (*see* Pratt and Ballmer 1993). This may be difficult or impossible for some butterfly species, particularly those that specialize in a single hostplant. Increasing temperatures may also have varying effects on insect development and reproduction (Sehnal et al. 2003).

New research suggests that species and ecosystems will need to shift (northward, away from the equator) an average of .42 km per year to survive the deleterious effects of increasing temperatures associated with climate change (Loarie et al. 2009). Distances may be greater, more than 1 km per year, for species in deserts, where climate change is predicted to have greater effect (Loarie et al. 2009). Research on a sample of 35 nonmigratory butterflies in Europe showed that 63 percent had ranges that shifted northward by 35 to 240 km during the 20th century (while only 3 percent shifted to the south) (Stiling 2003).[3] It is unlikely that small, isolated populations of imperiled butterflies in the Great Basin, already dependent on diminished and likely immovable habitats, will be able to shift to other habitats to adapt to the effects of climate change.

[3] Importantly, while butterflies may not be useful indicator species of ecosystem health, they might signal effects of climate change on butterfly populations and assemblages (Fleishman and Murphy 2009).

Fleishman (2008: 61) summarized the potential effects of climate change in the Great Basin to species persistence:

> Native species in the Great Basin are adapted to extreme and variable weather patterns on daily to decadal or longer time scales. The magnitude and speed of climatic changes anticipated by 2100 may exceed the plasticity of many species with respect to their phenology and patterns of resource use.

The specialized habitat requirements and limited mobility of many native or endemic species in the Great Basin limits their ability to adapt to anthropogenic environmental change (Fleishman 2008). Moreover, species and habitats already stressed by water diversion, groundwater pumping, development, grazing and other threats will be less able to cope with climate change.

Biological Vulnerability. The butterflies petitioned here have limited distribution and apparently small and/or a small number of populations, which may increase the likelihood of extinction.[4] The Service has recognized this threat for other species. For the Langford's tree snail (*Partula langfordi*), the Service stated:

> Even if the threats responsible for the decline of this species were controlled, the persistence of existing populations is hampered by the limited number of known individuals of this species. This circumstance makes the species more vulnerable to extinction due to a variety of natural processes. Small populations are particularly vulnerable to reduced reproductive vigor caused by inbreeding depression, and they may suffer a loss of genetic variability over time due to random genetic drift, resulting in decreased evolutionary potential and ability to cope with environmental change (Lande 1988; Pimm et al. 1988; Center for Conservation Update 1994; Mangel and Tier 1994).

FWS 2009b: 5.

Here, the Service relied on citations not specific to *Partula langfordi* that indicate the threat to survival presented by limited population numbers even without other known threats. The Service similarly noted for a snail called Sisi (*Ostodes strigatus*), "[e]ven if the threats responsible for the decline of this species were controlled, the persistence of existing populations is hampered by the small number of extant populations and the small geographic range of the known populations" (FWS 2009a: 4).

Britten et al. (2003) noted that characteristic population fluctuation and short generation times, combined with small populations, can influence genetic diversity and may threaten long-term persistence of a butterfly. Moreover, Sanford (2006) contended population size is not as important as the number of populations when assessing the status of an imperiled butterfly. Many of the butterflies petitioned here occur only as a single population or a few disparate populations. The Service should consider the threats of small population size and limited range to petitioned butterflies in its finding on this petition.

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[4] *See, e.g.,* Service candidate assessment forms for *Doryopteris takeuchii, Huperzia stemmermanniae, Megalagrion nesiotes, Melicope degeneri, Melicope hiiakae, Myrsine mezii, Ostodes strigatus, Partula langfordi, Peperomia subpetiolata, Phyllostegia bracteata*, and *Tryonia circumstriata*, available at www.fws.gov/endangered/wildlife.html (accessed Jan. 11, 2009).

Some petitioned butterflies occur as isolated populations in patchy environments. The lack of dispersal corridors and/or resistance to dispersal (e.g., distance to nearest suitable habitat, barriers to movement, fragmentation from land development, etc.) may inhibit gene flow between populations and increase extinction probabilities (Wilcox and Murphy 1985, Ricketts 2001).[5] Habitat area and quality can be major predictors for sustaining populations (Hanski 1994, Fleishman et al. 2002), and habitat connectivity may be particularly important for conserving sensitive butterflies (Haddad 1999, Hudgens and Haddad 2003, Haddad and Baum. 1999). Management and land use planning should conserve both occupied and potential habitat patches to allow for butterflies to disperse, evolve and adapt to changing environmental conditions (Britten et al. 2003, Sanford 2006). The Service should consider the threats of isolated populations and habitat fragmentation to all of the petitioned butterflies in its finding on this petition.

B. Petitioned Great Basin Butterflies

Baking Powder Flat blue butterfly
Euphilotes bernardino minuta (Austin 1998)

Classification and Nomenclature

Common Name. *Euphilotes bernardino minuta* is known as the "Baking Powder Flat blue butterfly," after the location where the subspecies was described.

Taxonomy. The petitioned subspecies is *Euphilotes bernardino minuta* Austin, 1998.

Table 2. Taxonomy of *Euphilotes bernardino minuta*	
Kingdom	Animalia
Phylum	Arthropoda
Class	Insecta
Order	Lepidoptera
Family	Lycaenidae
Genus	*Euphilotes*
Species	*Euphilotes bernardino*
Subspecies	*Euphilotes bernardino minuta*
Sources: NatureServe (2009); Integrated Taxonomic Information System, www.itis.gov.	

[5] Even more vagile insect species, such as the dragonfly, which may fly relatively long distances between suitable habitats, may be affected by habitat loss and fragmentation (Simpkin et al. 2000).

Description, Life History, Distribution

Austin (1998c: 549) described the Baking Powder Flat blue:

> MALE. Size = 9.6 [mm] (9.0-10.2 [mm]). Dorsum purplish-blue (near Campanula); black outer margin of moderate width (occasionally broad); veins black distally on both wings; often submarginal orange (near Spectrum Orange) in posterior cells on hindwing; fringes white and lightly checkered with gray. Ventral surface grayish-white; maculation moderately developed; slight posterior gray flush on forewing; hindwing with Chrome Orange aurora of moderate width.
>
> FEMALE. Size = 10.4 [mm] (9.7-11.0 [mm]). Dorsum dark brownish-gray (Hair Brown), slightly grayer basally; hindwing with orange (near Spectrum Orange) aurora of moderate width, this outlined distally with series of blackish marginal spots; fringes as male. Venter as male.

Photographs of pinned Baking Powder Flat blue butterflies are posted at http://butterfliesofamerica.com/euphilotes_bernardino_minuta.htm.

Austin (1998c) described this subspecies from Baking Powder Flat in Spring Valley in White Pine County. The BLM has written that Baking Powder Flat is the largest contiguous habitat for the Baking Powder Flat blue butterfly (BLM 2009). The subspecies has only been found at Baking Powder Flat (Austin and Leary 2008, Austin 1998c). *Euphilotes* is noteworthy for its close relationship with the plant genus *Eriogonum* (wild buckwheat) (72 FR 24253). Many species and subspecies of *Euphilotes* have highly restricted ranges, in part because of this specialized relationship with *Eriogonum* (72 FR 24253).

Euphilotes spp. may remain in diapause in sandy substrates or leaf litter for several years while waiting for appropriate conditions to emerge as adults (A. Warren, pers. comm.). For this reason, it may be difficult to census *Euphilotes* populations. However, in the case of the Baking Powder Flat blue, surveys have found no populations beyond Baking Powder Flat (B. Boyd, pers. comm.).

Conservation Status, Threats

NatureServe (2009) reviewed the Baking Powder Flat blue butterfly in 1999 and nationally ranked it as “critically imperiled.” NatureServe (2009) also ranked the subspecies as “critically imperiled” in Nevada. The BLM lists the Baking Powder Flat blue as a “sensitive species” in Nevada (BLM 2007a). Wisdom et al. (2005: 293, Table A5.1) identified the butterfly as a species of conservation concern. Rich (1999) also included the subspecies in a comprehensive review of sensitive flora and fauna in sagebrush steppe.

Baking Powder Flat is described as “a flat valley bottom (an old dry lake bed) with scattered low sand dunes” (Austin 1998c: 550). Austin (1998c) noted that the butterfly’s hostplant, Shockley’s buckwheat (*Eriogonum shockleyi shockley*), grows on the hard and otherwise bare areas between the dunes[6] (Austin identified the plant as *Eriogonum shockleyi longilobum,* a synonymous, but outdated classification for the plant). Some *Eriogonum* spp. are evolved to grow on dry or exposed sites (like Baking Powder Flat) (Pratt 1994, reviewing literature), and their presence may prevent or reduce weed incursion onto a site (Monsen et al. 2004).

The BLM has described Shockley's buckwheat (a.k.a. "Shockley buckwheat," "matted cowpie buckwheat") as "a common, mound-forming plant often found on fine-textured substrates" and noted its dominance at Baking Powder Flat (BLM 2009: 20). However, the agency also lists the plant as a "sensitive species" in Idaho (BLM 2007a). Wisdom et al. (2005: 297, Table A5.1) identified the Shockley's buckwheat as a species of conservation concern in the Great Basin.

The BLM designated Baking Powder Flat as an Area of Critical Environmental Concern (ACEC) in 2008 (72 FR 67748, 73 FR 55867) (pending any litigation that may affect final designation of the ACEC). The ACEC totals 13,640 acres. Livestock grazing and limited off-road vehicle use are authorized in the ACEC (BLM 2007b: 2.4-101).

Three grazing allotments appear to cover parts of the Baking Powder Flat ACEC (BLM 2007b: Map 2.4 16-1). The grazing allotments are large, perennial allotments and grazing is authorized for relatively large numbers of livestock (BLM 2007b: 3.16-3).

Table 3. Grazing Allotments in Baking Powder Flat ACEC

Grazing Allotment	Allotment Number	Acres	Active AUMs	Evaluated for Meeting Standards of Rangeland Health
Scotty Meadows	10128	17,322	1,227	Not evaluated
Willow Springs	10129	46,967	6,608	Evaluated
Spring Valley	10130	79,323	6,329	Evaluated

Source: BLM 2007b: 2.4-68 – 2.4-73, Tables 2.4-15, 2.4-16.

These three allotments are subject to regular, if not heavy grazing use (a 2009 BLM proposal to install a piezometer and staff gage in the Baking Powder Flat ACEC noted that the selected project site was "heavily impacted" by livestock (BLM 2009: 21)). *Eriogonum* spp. are palatable to (if not preferred by) livestock and native ungulates (Monsen et al. 2004). Although Shockley's buckwheat is susceptible to grazing (*see* Moseley and Reveal 1996), trampling and destruction from soil compaction by livestock is a greater concern (NatureServe 2009, B. Boyd, pers. comm.). A reduction of Shockley's buckwheat at Baking Powder Flat could negatively affect the Baking Powder Flat blue (NatureServe 2009).

The Nevada Natural Heritage Program ranked the Baking Powder Flat playa/ephemeral pool/spring pool complex among the 26 highest priority wetland areas in the state (NNHP 2008). Water diversion/development, groundwater pumping, farming, livestock grazing and mining are considered the greatest threats to the area (NNHP 2008: 42). It is estimated that 30 percent of the area has already been degraded or converted to other land uses (NNHP 2008). Fire in

[6] The hard interspaces between dunes at Baking Powder Flat are in fact overlaid by a soft, fragile, fine textured substrate (B. Boyd, pers. comm.).

surrounding sagebrush and subsequent invasion by nonnative weeds are also identified as potential threats to the Baking Powder Flat (B. Boyd, pers. comm.).

Now the Southern Nevada Water Authority has proposed to pump and transfer 91,200 acre-feet of groundwater per year from Spring Valley (Myers 2006). If permitted, groundwater pumping at this rate would lower aquifers 200 feet in 100 years and 300 feet in 1,000 years (Myers 2006). The Baking Powder Flat complex, located at the southern end of Spring Valley, could be negatively affected in the short- and intermediate-term (Myers 2006). Charlet (2006) predicted that water pumping will cause desertification at Baking Powder Flat long-term (1,000 years). Myers (2006) criticized the effectiveness of monitoring and mitigation programs to avoid adverse effects of proposed groundwater pumping in Spring Valley.

Bleached sandhill skipper
Polites sabuleti sinemaculata (Austin 1987)

Classification and Nomenclature

Common Name. *Polites sabuleti sinemaculata* is known as the "bleached sandhill skipper" (NatureServe 2009). It may also be called "Denio sandhill skipper" (NNHP 2009). We refer to the subspecies as the bleached sandhill skipper in this petition.

Taxonomy. The petitioned subspecies is *Polites sabuleti sinemaculata* Austin, 1987.

Table 4. Taxonomy of *Polites sabuleti sinemaculata*	
Kingdom	Animalia
Phylum	Arthropoda
Class	Insecta
Order	Lepidoptera
Family	Hesperiidae
Genus	Polites
Species	*Polites sabuleti*
Subspecies	*Polites sabuleti sinemaculata*
Sources: NatureServe (2009); Integrated Taxonomic Information System, www.itis.gov.	

Description, Life History, Distribution

Austin (1987: 7-8) described bleached sandhill skipper:

> MALE. Size large (LFW=12.6mm., [l1.9-13.4mm)) for *Polites sabuleti*. Dorsum bright golden-orange with a prominent black stigma on primaries of the form of all *P. sabuleti*. Poststigmal patch grayish and typical for the species. Dark margin of primaries absent to faint, usually indicated only by a slightly darker yellow-orange color. Terminal line black, prominent. Fringes of same golden-yellow as wing. Secondaries with no outer marginal border, black along costal and anal margins narrow, base of wing usually dusted lightly with black. Terminal line and fringes as on primaries.

Ventral surface paler yellow-orange than dorsum. Black of primaries restricted to very base of cell and narrowly along posterior margin, not extending as far distally as usual on other *Polites sabuleti.* Pattern typical of species but very faintly contrasting, indicated by slightly differing shades of yellow-orange. Secondaries with cobweb pattern also faintly indicated. Genitalia the most distinctive of those *P. sabuleti* examined in this study (Fig. 6). Basically, of typical *P. sabuleti* form but with a relatively longer and more curved saccus, valvae very heavily covered with whitish "hairs".

FEMALE. Size large (LFW=14.0mm., [13.1-15.0mm)) for *Polites sabuleti.* Dorsal wing color pale yellow-orange with typical *P. sabuleti* pattern present but washed out and less distinctly indicated: dark areas narrower, these heavily overscaled with ground color. Postmedial area of primaries whitish-yellow. Terminal line dark gray, fringes pale grayish on primaries, white on secondaries.

Ventral surface paler with pattern more distinctly indicated than on male. Postmedial pale areas of primaries and postmedian band and associated pattern of secondaries ghostly white.

Photographs of pinned bleached sandhill skipper butterflies are posted at http://www.butterfliesofamerica.com/polites_sabuleti_sinemaculata.htm.

The bleached sandhill skipper is known only from one location, at Baltazor Hot Spring near Denio Junction in Humboldt County, Nevada, where it was first described (Austin 1987). The type locality is a salt flat with dense growth of *Distichlis spicata* (saltgrass), which probably serves as the larval hostplant (Austin 1987). Adults, which may fly in late summer, were found taking nectar from *Asteraceae* (Austin 1987).

The bleached sandhill skipper lacks patterning of other *Polites sabuleti* subsp. and is considered “by far the most distinctive” of the subspecies (Austin 1987: 8). The bleached sandhill skipper appears quite different from all other nearby populations of *P. sabuleti* (Austin 1987).

Conservation Status, Threats

NatureServe (2009) reviewed the bleached sandhill skipper in 1998 and nationally ranked the subspecies as “critically imperiled.” NatureServe (2009) also ranked the subspecies as “critically imperiled” in Nevada. The Service identifies the bleached sandhill skipper as a “species of concern” (FWS 2009c) and previously designated it as a "category 2" candidate species under the Endangered Species Act (59 FR 58982). The BLM lists the butterfly as a “sensitive species” in Nevada (BLM 2007a). Wisdom et al. (2005: App. 2, Table A2.6) identified the bleached sandhill skipper as a species of conservation concern. Rich (1999) also included the subspecies in a comprehensive review of sensitive flora and fauna in sagebrush steppe.

Austin (1985a) noted that *Polites sabuleti* subsp. appear restricted largely to the valley(s) where they occur in the Great Basin. The bleached sandhill skipper is only known to occur at one salt flat (Austin 1987; B. Boyd, pers. comm.). Although thousands of bleached sandhill skipper have been observed flying in the past (A. Warren, pers. comm.), the population appeared to have declined upon observation 2-3 years ago (B. Boyd, pers. comm.).

Continental Lake and Baltazor meadow are identified as a priority wetland in Nevada; 20 percent of the area is degraded or converted to other uses (NNHP 2006).

Carson Valley silverspot
Speyeria nokomis carsonensis (Austin, 1998)

Classification and Nomenclature

Common Name. *Speyeria nokomis carsonensis* is known as the "Carson Valley silverspot."

Taxonomy. The petitioned subspecies is *Speyeria nokomis carsonensis* Austin, 1998.

Table 5. Taxonomy of *Speyeria nokomis carsonensis*	
Kingdom	Animalia
Phylum	Arthropoda
Class	Insecta
Order	Lepidoptera
Family	Nymphalidae
Genus	*Speyeria*
Species	*Speyeria nokomis*
Subspecies	*Speyeria nokomis carsonensis*
Sources: NatureServe (2009); Integrated Taxonomic Information System, www.itis.gov.	

Description, Life History, Distribution

Austin (1998d: 573-574) described Carson Valley silverspot:

> MALE. Size = 39.1 [mm] (36.3-41.2 [mm]). Dorsum near Spectrum Orange on hindwing, forewing sightly darker; forewing marked with black as follows: five sinuous lines across discal cell (including one at distal end of cell forming "B" shape), irregular median series of curved black bars in each cell, another black bar distal to this in cell R4+5-MI, postmedian series of spots, submarginal series of chevrons, marginal line connected narrowly along veins to terminal line; blackish smudges on veins lA+2A, CuA_2 and CuA_l proximal to median series of spots; base of wing brownish-orange; veins very narrowly black. Hindwing marked with black as follows: discal cell with "V" shaped mark and bar just proximal to it, irregular series of broad median chevrons, postmedian series of small chevron to arrowhead shaped spots (often absent anteriorly), faint to prominent series of submarginal chevrons, black marginal line very narrowly connected along veins to black terminal line; base of wing brownish-orange; hair-like scent scales proximally along veins Rs, M_l and upper discal cell vein; fringes yellowish, interrupted by black vein tips on forewing.
>
> Ventral forewing Orange-Rufous; apex Buff, marks as on dorsum but somewhat narrower; silvered spots proximal to postmedian spots in R_4+$_5$-M_1 and M_1-M_2 and distal to submarginal chevrons anteriorly; veins brown. Hindwing ground color Buff, very sparsely scaled on proximal 1/2 with black, appearing slightly greenish; silvered spots as follows: basally on costal margin, base of discal cell, cell Sc+R_1Rs and CuA_2-1A+2A (latter outlined

very thinly with black distally), round spot in mid discal cell (encircled with black), median spots in $Sc+R_1Rs$, discal cell and CuA_2-1A+2A, complete postmedian series of triangular shaped spots, complete submarginal series of triangular shaped spots (all latter edged proximally with black, postmedian series with indistinct black line on distal side of spots); complete submarginal line distal to silvered spots and terminal line black; veins thinly brownish-orange.

FEMALE. Size = 38.9 [mm] (37.2-40.7 [mm]). Dorsal ground color near Trogon Yellow; black marks as male; wing bases dark brown to mid discal cell on forewing, then nearly meeting black postmedian line on both wings; forewing with slight orange tinge to pale areas except apically; hindwing with strong orange tinge in cell $Sc+R_1Rs$, adjacent to median black in cell $Rs-M_1$ (often in M_1-M_2 also) and often along anal margin.

Ventral forewing as male but yellow nearer Trogon Yellow with some black scaling giving greenish aspect; hindwing of same ground color; proximal 2/3 with dark underscaling giving obvious greenish (Olive-Yellow) aspect.

Photographs of live and pinned Carson Valley silverspot butterflies and their habitat are posted at http://montesanford.com/?p=399 and http://montesanford.com/?p=405 and http://butterfliesofamerica.com/speyeria_nokomis_carsonensis.htm.

The Carson Valley silverspot butterfly is a distinct phenotype of the Apache fritillary (*Speyeria nokomis apacheana*) that was recently recognized as a separate subspecies (Austin 1998d). The silverspot uses wet meadows and other mesic habitats where its larval hostplant, *Viola nephrophylla*, grows (TNC c2009, factsheet).[7] Austin (1998d: 574) describes its range as "...isolated colonies in wet meadows along the eastern base of the Carson Range from southern Washoe County, Nevada south to northern Alpine County, California, in the Pine Nut Mountains, Douglas County, Nevada and into the Sweetwater Mountains, Lyon County, Nevada." The subspecies might also be present along the Walker River drainage in Mono County, California (TNC c2009, factsheet). More recent observations suggest that the subspecies is not as widely distributed as described. Adults fly from late July to September (Davenport et al. 2007).

Conservation Status, Threats

NatureServe (2009) reviewed the Carson Valley silverspot in 1999 and globally and nationally ranked the subspecies as "critically imperiled." NatureServe (2009) also ranked the subspecies as "critically imperiled" in California and Nevada. The Service identifies Carson Valley silverspot as a "species of concern" (FWS 2009c) and previously designated it as a "category 2" candidate species under the Endangered Species Act (59 FR 58982). The BLM lists the butterfly as a "sensitive species" in Nevada (BLM 2007a). Rich (1999) included the subspecies in a comprehensive review of sensitive flora and fauna in sagebrush steppe. The silverspot is reduced from historic abundance (M. Sanford, pers. comm.) and populations continue to decline (NNHP 2006).

[7] *Speyeria* may also use other species of *Viola* as hostplants (Austin and Leary 2008).

The Carson Valley silverspot may occur at approximately 37 sites within its current range (M. Sanford, pers. comm.). The Nevada Natural Heritage Program has recorded thirteen occurrences[8] of Carson Valley silverspot in Nevada (NNHP 2009), several of them at important conservation sites identified by the program (where the subspecies is apparently declining) (NNHP 2006).

Table 6. Nevada Natural Heritage Program Conservation Sites with Recorded Occurrences of Carson Valley Silverspot

NNHP Site	Land Ownership (KNOWN)	Land Ownership (POSSIBLE)	County	Latest Year Observed / Site Surveyed
Carson Range North	BLM Forest Service	Private	Washoe	1958
Snow Valley	Forest Service Private	BLM State	Carson Valley	1965
Mineral Valley		BLM Private	Douglas	1964
Pine Nut Creek	BLM	Private	Douglas	1964
Sugar Loaf	Private	BLM	Douglas	1977

Source: NNHP (2006).

All conservation sites with recorded occurrences of Carson Valley silverspot are "companion" conservation sites associated with other, higher priority conservation areas. All of the sites are important for the habitat they provide to imperiled species, and all of them may be threatened by habitat loss in the foreseeable future (NNHP 2006). No records for Carson Valley silverspot were found in the California Wildlife Habitat Relationships System, and no Special Status Invertebrate Species Accounts have been prepared on the butterfly.

Most populations of Carson Valley silverspot are believed to occur in the Carson Valley, at wetlands, meadows and other mesic habitats associated with the Carson River and its tributaries. Most of the valley is privately owned. There are some tribal lands in the valley. The BLM owns much of the uplands surrounding the river in Nevada. The Forest Service is the primary owner of both the river corridor and uplands in the headwaters of the Carson River in California (TNC 2008).

The Nevada Natural Heritage Program ranked the Carson River among the 26 highest priority wetland areas in the state, and listed a multitude of associated sites—tributaries, riparian areas, wet meadows, marshes, ponds, and ephemeral pools—in the Carson Valley as additional priority areas (NNHP 2008). Many of the areas are significantly degraded or converted to other land uses (NNHP 2008: 36). Water diversion/development, groundwater pumping, land development, farming, and livestock grazing continue to threaten these habitats (NNHP 2008: 36).

The Nature Conservancy has also identified the Middle Carson River as a "portfolio site" of immediate importance to conservation in the Great Basin (TNC 2008). The Conservancy noted that wetlands have been significantly reduced from their historic extent in the valley and

[8] Species "occurrences" recorded in the Nevada Natural Heritage Program database may not represent total occurrences in the state or represent the current range of a species. Also, multiple occurrences recorded in the database might be reported from the same location.

identified land development, groundwater pumping, invasive plant species, conversion to agricultural use, inappropriate livestock grazing and application of herbicides as the most important threats to remaining wetlands and wet meadows (TNC 2008).

These land uses and related effects fragment, degrade and eliminate butterfly habitat. The spread of nonnative tall whitetop (*Lepidium latifolium*), for example, can dominate native herbaceous communities in the Carson Valley (TNC 2008), potentially crowding out the silverspot's larval hostplant and nectaring plants. Impacts from livestock grazing (i.e., trampling) and herbicide use may facilitate the spread of invasive plants by reducing the competitiveness of native plant species.

Some populations of Carson Valley silverspot, as well as some potential habitat, occur on properties at least partially protected from land development through conservation easements. Unfortunately, these lands are not immune from the effects of groundwater pumping, invasive species and other threats. Livestock grazing and other agricultural use also tend to occur on these areas, which have occasionally significantly reduced resident silverspot populations (M. Sanford, pers. comm.).

Populations of Carson wandering skipper are similarly confined to disjunct habitat patches in the Carson Valley that, although saved from land development, are nonetheless vulnerable to external threats such as groundwater pumping. The threats and challenges to conserve the skipper, as summarized by Sanford (2006: 396), are applicable to the silverspot:

> Conservation of habitat patches has been highly successful. However, land development and groundwater withdrawal are in high demand surrounding the species' habitat and pose significant impacts on its survival. The species survival or extinction will be dictated by these land uses. Land development may decrease dispersal capabilities, and groundwater withdrawal may cause a vegetation shift resulting in the loss of skipper populations. Recovery will depend on the adaptive management of land uses that conserves current populations and on [sic] permits dispersal among the network of habitat patches.

Most sites known or believed to host populations of Carson Valley silverspot are not protected by conservation easements and may be vulnerable to development. Increasing human populations in the Carson Valley and in Nevada are driving new real estate development in the Carson Valley (TNC 2008). Rangelands, croplands and natural habitats are being converted to new housing, light industry, and recreational uses such as golf courses (TNC 2008, M. Sanford, pers. comm.). Residential and commercial development on these sites and/or on adjacent properties may eliminate and fragment habitat for the Carson Valley silverspot (*see* Sanford 2006 (land development is a primary threat to the Carson wandering skipper)). Habitat fragmentation can isolate populations, reduce connectivity between populations and hamper dispersal to other suitable habitat. Isolation of individual populations may be especially harmful if the silverspot occurs as a metapopulation, as some experts believe (Fleishman et al. 2002, Sanford et al, in press).

New development and industry has also increased demand on local groundwater resources (TNC 2008 and others). Increased groundwater pumping may affect flow to seeps and springs, and any change in the timing, duration and volume of flow from seeps and springs could adversely affect the silverspot's larval hostplant and, therefore, the butterfly itself.

While light or moderate grazing may help maintain wet meadows on the valley floor (TNC 2008), heavy livestock grazing on public and private land in the Sierra Nevadas, Pine Nut Mountains and Sweetwater Mountains, has severely degraded smaller, more fragile habitats for the Carson Valley silverspot. Annual grazing removes vegetation from seep- and spring-fed meadows and water diversions to support grazing have caused meadows to dry up, eliminating silverspot habitat. These higher elevation seeps and springs represent a last refuge for the subspecies as groundwater pumping and/or climate change dry out moist habitats in the Carson Valley below.

It is unknown whether the Jack's Valley Wildlife Management Area (WMA) south of Carson City in Douglas County provides habitat for the Carson Valley silverspot. Also, part of the WMA is bounded by residential development, which might render it unavailable to the butterfly.

Carson Valley wood nymph
Cercyonis pegala carsonensis (Austin, 1992)

Classification and Nomenclature

Common Name. *Cercyonis pegala carsonensis* is known as the "Carson Valley wood nymph."

Taxonomy. The petitioned subspecies is *Cercyonis pegala carsonensis* Austin, 1992.

Table 7. Taxonomy of *Cercyonis pegala carsonensis*	
Kingdom	Animalia
Phylum	Arthopoda
Class	Insecta
Order	Lepidoptera
Family	Nymphalidae
Genus	*Cercyonis*
Species	*Cercyonis pegala*
Subspecies	*Cercyonis pegala carsonensis*
Sources: NatureServe (2009); Integrated Taxonomic Information System, www.itis.gov.	

Description, Life History, Distribution

Austin (1992: 10-11) described Carson Valley wood nymph:

> MALE. Size = 26.5 (25.0-28.4). Dorsum brown (Prout's Brown to Burnt Umber); forewing with two black submarginal ocelli with minute white pupils, posterior ocellus same size to larger than anterior, both outlined narrowly with yellowish (Trogon Yellow), sometimes obscure especially proximally; terminal, marginal and submarginal lines indistinctly darker than ground color. Hindwing with thin marginal and broader submarginal blackish brown

lines; white-pupiled (rarely blind) black ocellus in cell CuA_1-CuA_2, this smaller than forewing ocelli, usually outlined with Trogon Yellow at least distally; often small to minute, blind ocelli (sometimes outlined as main ocellus) in one or both adjacent cells and less often extending anteriorly to cell M_2-M_3; fringes brownish on both wings, similar to ground color.

Ventral surface paler than dorsum (Drab to Brussels Brown, often with grayish cast especially on hindwing); forewing ocelli similar to those on dorsum, pupils white but larger than on dorsum and frequently with trace of blue, yellow outlines broader and occasionally fusing narrowly between ocelli, this yellow margined indistinctly with brown, field containing ocelli lightly striated; basal portion of wing moderately striated; postmedian line distinct; thin, dark brown terminal, marginal and submarginal lines. Hindwing moderately striated; terminal, marginal, submarginal and postmedian lines as on forewing; nearly always six ocelli with small white pupils, outlined with Trogon Yellow and then indistinctly with brown, posterior group of ocelli usually roundish and separate, anterior group variable with center ocellus usually drawn out proximally-distally, often fused with ocellus posterior to it.

FEMALE. Size = 29.0 (27.0-31.0). Dorsum pale brown (Prout's Brown to Mikado Brown); forewing with submarginal ocelli as male but larger, outlined more broadly with Trogon Yellow, this usually fused into relatively distinct (but not sharply defined) yellowish field; terminal, marginal and submarginal lines as on male. Hindwing with ocelli as on male; submarginal area usually Trogon Yellow, this grading gradually into ground color proximally; terminal, marginal and submarginal lines as on male.

Ventral surface paler than dorsum (Cinnamon-Drab to Fawn Color); markings much as on male but field around forewing ocelli paler than ground color, usually yellowish; yellow around ocelli more often fused. Hindwing marked as male; occasional ocelli absent and less fusion among anterior group; area distal to postmedian line whiter than basal area.

Photographs of live Carson Valley wood nymph butterflies and their habitat are posted at http://montesanford.com/?p=394. Photographs of pinned specimens are posted at http://butterfliesofamerica.com/cercyonis_pegala_carsonensis.htm.

Cercyonis pegala lives in wet areas in many Great Basin valleys, occurring as several subspecies (Austin 1992, citing Austin 1985a). The Carson Valley wood nymph was described from lush, wet meadows in the Carson Valley, at the base of the Carson Range in Nevada (Austin 1992). The larval hostplant for this subspecies is unknown (M. Sanford, pers. comm.). Adults fly from early July to early September and were observed taking nectar from white and yellow *Apiaceae* and *Asteraceae* (Austin 1992).

Austin (1992) described the current range for the Carson Valley wood nymph as including parts of southern Washoe County, south through the Carson Valley, to extreme east-central Alpine County on the California state border (Austin 1992). The Nevada Natural Heritage Program has recorded 14 occurrences of Carson Valley wood nymph (NNHP 2009) (recent surveys have found the butterfly at 12 sites in the valley). However, populations appear to be declining (between 10-30 percent in the short-term), and the subspecies may already be extirpated in Washoe County (NatureServe 2009).

Conservation Status, Threats

NatureServe (2009) reviewed the Carson Valley wood nymph in 2005 and globally and nationally ranked the subspecies as "imperiled." NatureServe (2009) also ranked the subspecies as "imperiled" in Nevada and "imperiled – critically imperiled" in California. The Service identifies Carson Valley wood nymph as a "species of concern" (FWS 2009c) and previously designated it as a "category 2" candidate species under the Endangered Species Act (59 FR 58982). The BLM lists the butterfly as a "sensitive species" in Nevada (BLM 2007a). Rich (1999) included the subspecies in a comprehensive review of sensitive flora and fauna in sagebrush steppe. Surveys conducted between 2001-2006 indicate that some populations of the wood nymph have been extirpated in recent years (M. Sanford, pers. comm.).

Austin (1985a) noted that *Cercyonis* spp. appear restricted largely to the valley(s) where they occur in the Great Basin. Carson Valley wood nymph is limited to the Carson Valley, where it uses wetlands, spring- and seep-fed meadows and similar habitats. Most of the valley is privately owned. There are some tribal lands in the valley. The BLM owns much of the uplands surrounding the river in Nevada. The Forest Service is the primary owner of both the river corridor and uplands in the headwaters of the Carson River in California (TNC 2008).

The Nevada Natural Heritage Program ranked the Carson River among the 26 highest priority wetland areas in the state, and listed a multitude of other sites—tributaries, riparian areas, wet meadows, marshes, ponds, and ephemeral pools—in the Carson Valley as additional priority areas (NNHP 2008). Many of the areas are significantly degraded or converted to other land uses (NNHP 2008: 36). Water diversion/development, groundwater pumping, land development, farming, and livestock grazing continue to threaten these habitats (NNHP 2008: 36, NatureServe 2009). These threats are considered "substantial" and "imminent" (NatureServe 2009).

The Nature Conservancy has also identified the Middle Carson River as a "portfolio site" of immediate importance to conservation in the Great Basin (TNC 2008). The Conservancy noted that wetlands have been significantly reduced from their historic extent in the valley and identified land development, groundwater pumping, invasive plant species, conversion to agricultural use, inappropriate livestock grazing and application of herbicides as the most important threats to remaining wetlands and wet meadows (TNC 2008).

These land uses and related effects fragment, degrade and eliminate butterfly habitat. The spread of nonnative tall whitetop (*Lepidium latifolium*), for example, can dominate native herbaceous communities in the Carson Valley (TNC 2008), potentially crowding out the wood nymph's larval hostplant and nectaring plants. Impacts from livestock grazing (i.e., trampling) and herbicide use may also facilitate the spread of invasive plants by reducing the competitiveness of native plant species.

Some populations of Carson Valley wood nymph, as well as some potential habitat, occur on properties at least partially protected from land development through conservation easements. Unfortunately, these lands are not immune from the effects of groundwater pumping, invasive species and other threats. Livestock grazing and other agricultural use also tend to occur on these areas.

Most sites known or believed to host populations of Carson Valley wood nymph are not protected by conservation easements and may be vulnerable to development. Increasing human populations in the Carson Valley and in Nevada are driving new real estate development in the Carson Valley (TNC 2008). Rangelands, croplands and natural habitats are being converted to new housing, light industry, and recreational uses such as golf courses (TNC 2008, M. Sanford, pers. comm.). Residential and commercial development on these sites and/or on adjacent properties may eliminate and fragment habitat for the Carson Valley wood nymph (*see* Sanford 2006 (land development is a primary threat to the Carson wandering skipper)). Habitat fragmentation can isolate populations, reduce connectivity between populations and hamper dispersal to other suitable habitat.

New development and industry has also increased demand on local groundwater resources (TNC 2008 and others). Increased groundwater pumping may affect flow to seeps and springs, and any change in the timing, duration and volume of flow from seeps and springs could adversely affect the wood nymph's habitat.

While light or moderate grazing may help maintain wet meadows in Carson Valley (TNC 2008), heavy livestock grazing on public and private land can eliminate or degrade butterfly habitat.

It is unknown whether the Jack's Valley Wildlife Management Area (WMA) south of Carson City in Douglas County provides habitat for the Carson Valley wood nymph. Also, part of the WMA is bounded by residential development, which might render it unavailable to the butterfly.

Mattoni's Blue Butterfly
Euphilotes pallescens mattonii (Shields, 1975)

Classification and Nomenclature

Common Name. *Euphilotes pallescens mattonii* is known as "Mattoni's blue butterfly."

Taxonomy. The petitioned subspecies is *Euphilotes pallescens mattonii* Shields, 1975. Shields (1975) originally classified the species as *Shijimiaeoides rita mattonii*. The subspecies was subsequently reclassified as *Euphilotes* species (Pratt 1994: 400), but questions concerning its classification persisted.

NatureServe (2009) classifies Mattoni's blue as *Euphilotes pallescens mattonii,* following Opler and Warren (2003) and Austin (1998a). The Nevada Natural Heritage Program also classifies the subspecies as *Euphilotes pallescens mattonii* (NNHP 2009). The BLM lists the butterfly as *E. p. mattonii*, as well (BLM 2007a).

Other sources classify Mattoni's blue differently. Both the Service (59 FR 58982) and Hodges (1983: 56) used the scientific name *Euphilotes rita mattoni* (*see also* Tilden and Smith 1986, Miller 1992, Shields and Reveal 1988). The different classifications result from confusion over how to classify similar *Euphilotes* taxa (Pratt and Emmel 1998).

While there is continued research into differentiation between *E. pallescens* and *rita* (Cassie et al. 2001: 13), *E. pallescens mattonii* is more recently and widely used for Mattoni's blue. For example, Austin (1985b) listed the subspecies as *E. r. mattonii* in 1985, before reclassifying it as *E. pallescens mattonii* in 1998.

Table 8. Taxonomy of *Euphilotes pallescens mattonii*	
Kingdom	Animalia
Phylum	Arthropoda
Class	Insecta
Order	Lepidoptera
Family	Lycaenidae
Genus	*Euphilotes*
Species	*Euphilotes pallescens*
Subspecies	*Euphilotes pallescens mattonii*
Sources: NatureServe (2009); Integrated Taxonomic Information System, www.itis.gov.	

Description, Life History, Distribution

Shields (1975: 20) described Mattoni's blue:

Male: Holotype forewing, 10 mm. UPPER SURFACE, Primaries: lavender blue cyanic overlay; marginal line ½ mm wide, black scales extending *ca.* outer 1/3 of veins and scattered black scales over rest of veins (veins almost outlined thinly in black in several), blue scales lightly dusted with black scales over ground; fringe white with black checkering at vein tips (but usually lacking for M_1, and M_2); small 1/3 length fringe scales black, uneven.

Secondaries: fringe white except Cu_1, Cu_2, small row black and uneven; terminal band partially or nearly filling cells Sc and Rs; praeterminal macules fused on lower ½ to terminal line, giving scalloped appearance to band from M_1 to CU_2, or separate; some black scales dusting over blue ground overlay; aurora faintly present in Cu_1, Cu_2 of one, absent in the others; black scaling on outer 1/3 of veins M_2 to Cu_2, boxing in the praeterminal macules, veins M_1 and Rs completely covered with black scales.

UNDER SURFACE, Primaries: ground is snowy white with slight grayish cast in several; terminal line thin; macules heavily marked (except for faint praeterminal marks), slight or extensive smoky suffusion in cell Cu_2.

Secondaries: aurora golden orange or yellowish orange, 1/3 mm wide, continuous band from M_1 to Cu_2 (except one discontinuous), scalloped appearance; praeterminal marks separate from aurora; macules smaller than those of forewing.

Female: Allotype forewing, 11 mm. UPPER SURFACE, Primaries: ground dark brown, solid; discoidal spot distinct. Secondaries: aurora ¾ mm wide, from M_1 to Cu_2; fringe white without checkering; solid dark brown ground.

UNDER SURFACE, Primaries as in [male] except smoky suffusion below Cu_2.

Secondaries: as in [male] except aurora 1 mm wide.

Photographs of pinned Mattoni's blue butterflies are posted at http://butterfliesofamerica.com/euphilotes_pallescens_mattonii.htm.

Euphilotes pallescens is widespread across the Great Basin and in southern California. Despite this wide distribution, it occurs in isolated colonies (i.e., within subbasins), almost always near sandy sites where *Eriogonum* hostplants grow. This isolation has allowed for differentiation into subspecies (Austin 1998b).

Euphilotes taxa typically use one or a few species of *Eriogonum* for mating, feeding, and as larval hosts. Mattoni's blue was found using *Eriogonum microthecum laxiflorum* (slender buckwheat) at the type locality (Shields 1975). Slender buckwheat grows in mountain habitats above approximately 4,900 feet in elevation. Adults usually fly within the first two weeks of flowering. Mattoni's blue flies in July (Shields 1975). Females ovipost upon young flowers. Larvae feed on pollen and developing seeds (Pratt 1994, reviewing literature).

Shields (1975) discovered the Mattoni's blue in Elko County. The Nevada Natural Heritage Program noted that Mattoni's blue butterfly is endemic to Nevada and has recorded four occurrences of the subspecies in the state (NNHP 2009), apparently in the Pilot-Thousand Springs, Long-Ruby Valleys and Bruneau watersheds in Elko County (NatureServe 2009, Austin 1985b). *Euphilotes* spp. may remain in diapause in sandy substrates or leaf litter for several years while waiting for appropriate conditions to emerge as adults (A. Warren, pers. comm.). For this reason, it can be difficult to census *Euphilotes* populations.

Conservation Status, Threats

NatureServe (2009) reviewed Mattoni's blue butterfly in 1998 and nationally ranked the subspecies as "critically imperiled." NatureServe (2009) also ranked the subspecies as "critically imperiled" in Nevada. The Service identifies Mattoni's blue as a "species of concern" (FWS 2009c) and previously designated it as a "category 2" candidate species under the Endangered Species Act (59 FR 58982). The BLM lists the butterfly as a "sensitive species" in Nevada (BLM 2007a). Wisdom et al. (2005: 293, Table A5.1) identified the Mattoni's blue as a species of conservation concern. Rich (1999) also included the subspecies in a comprehensive review of sensitive flora and fauna in sagebrush steppe.

Mattoni's blue butterfly may be restricted to its current habitat in Elko County. If the subspecies is dependent on slender buckwheat, it may not be able to disperse long distances to other sites where it occurs (Shields and Reveal 1988). Land use, climate change and/or other factors could also hinder dispersal. For example, *Eriogonum* spp. are palatable to (if not preferred by) livestock (Monsen et al. 2004) and grazing and/or trampling could affect current and potential habitat for the butterfly.

Mono Basin Skipper
Hesperia uncas giulianii (McGuire, 1998)

Classification and Nomenclature

Common Name. *Hesperia uncas giulianii* and at least three other *Hesperia uncas* subspp. from central Nevada are generally called "Railroad Valley skipper" (NatureServe 2009 and others). However, the *giuliani* subsp. is also called "Mono Basin skipper" (NNHP 2009), the name we use in this petition to differentiate it from other *Hesperia uncas* subspp.

Taxonomy. The petitioned subspecies is *Hesperia uncas giulianii* (McGuire, 1998).

Table 9. Taxonomy of *Hesperia uncas giulianii*	
Kingdom	Animalia
Phylum	Arthropoda
Class	Insecta
Order	Lepidoptera
Family	Hesperiidae
Genus	*Hesperia*
Species	*Hesperia uncas*
Subspecies	*Hesperia uncas giulianii*
Sources: NatureServe (2009); Integrated Taxonomic Information System, www.itis.gov.	

Description, Life History, Distribution

McGuire (1998: 461-462) described Mono Basin skipper:

> MALE. Forewing length of holotype, 15.5 mm (paratype range 13.9-15.1 mm). Head: Dorsal hirsuite vestiture predominantly blue with greenish tint and some cream. Eyelash length about one-half greatest diameter of eye. Antennae with club abruptly constricting to apiculus from basal nudum segments; apiculus short with three to four segments ventrally. Thorax: dorsally with blue-green and cream vestiture; inconspicuous black underscaling with considerable iridescence present. Wings: moderately long and narrow with forewing somewhat pointed. Stigma with pocket of upper element moderately narrow, its width three times that of the antennal shaft; the lower element nearly continuous (linearly) with the upper element. Forewing upper surface bright fulvous with yellow-orange hue without olive tint, extending to subterminal spots; apical and subterminal spots pale yellow. Border fuscous, narrow and indistinct due to extensive overscaling of fulvous ground color. Hindwing below with overscaling light to mid-greenish ochre; veins generally white; spots white, prominent and moderately small with extension along veins in basal area; black patches distally bordering spots prominent except distal to cell spot where more diffuse, but still contrasting with adjacent spaces except for area basad of cell spot.
>
> FEMALE. Forewing length of allotype, 18.0 mm (paratype range 16.5-18.0 mm). Head: Eyelash length one-half to two-thirds greatest diameter of eye. Wings: rather broad and mildly rounded. Forewings above bright with extensive fulvous of rich tone; border minimal to moderate and indistinct with fuscous area extensively suffused with fulvous; apical and subterminal spots distinct and white. Hindwings above similar. Hindwings below light greenish with slightly darker green overscaling; minimal dark border of greenish brown along outer edge of spots; spots white, distinct and moderate; size with basad spots extending moderately along veins. Veins white but inconspicuous. Vannal region light yellow-green.

Photographs of live and pinned Mono Basin skipper are posted at http://butterfliesofamerica.com/hesperia_uncas_giuliani.htm.

Phenotypic characteristics of the Mono Valley skipper are similar, though altogether distinct, from those of three other *Hesperia* spp. petitioned here (see Table 10). Genitalia characters of the four subspecies are also distinctive, as summarized in Austin and McGuire (1998: 784, Table 2).

Table 10. Differentiation in Four *Hesperia uncas* in the Great Basin

Subspecies / Characteristic	*H. uncas fulvapalla*	*H. uncas grandiosa*	*H. uncas giulianii*	*H. uncas reeseorum*
Dorsum				
Ground color	yellow ocher	clay color	dull spectrum orange	clay color
Subapicalsmall, macules	large, chamois to pale horn color	medium, warm buff to trogon yellow	medium, warm buff to pale hom color	large, warm buff to chamois
Margins	indistinct to obsolete	relatively prominent to obsolete	relatively prominent	relatively prominent
Stigma	narrow	broad	narrow	broad
Female aspect	pale tawny	tawny to dark	tawny	tawny to dark
Venter				
Forewing color	yellow ocher paling to chamois or pale horn color	yellow ocher paling to pale horn color	orangish clay color paling to warm buff	yellow ocher paling to chamois
Hindwing color	smoke gray	olive gray to smoke gray	yellowish olive green to olive gray	lime green to smoke gray
Postmedium mascule width	very broad	broad	medium	narrow
Dark marks	indistinct	distinct	faint to distinct	distinct
Veins	white, to outer margin	white, to outer margin	white, not to outer margin	white, not to outer margin
Anal margin	chamois to pale horn color	buff yellow to sulphur yellow	buff yellow	buff yellow to sulphur yellow

Source: Austin and McGuire (1998).

The Mono Basin skipper is known only from the Adobe Hills in Mono County, California, where multiple occurrences were reported (McGuire 1998).[9] Specimens were found at 7,000-9,200 feet; at least one population was described using "open, sparse sage flats" (McGuire 1998: 462). The Mono Basin skipper flies from late May to mid-July (Davenport et al. 2007).

Habitat for the Mono Basin skipper at its type locality was described as gently rolling hills with sandy soil; sparse *Pinus monophylla* (singleleaf piñon) woodlands and sagebrush steppe (McGuire 1998). The skipper oviposited on *Stipa* spp., which was considered common in the area (McGuire 1998). *Eriogonum umbellatum* subsp., *Lupinus argenteus*, and *Stipa pinetorum* were additional plant associates reported in the area.

[9] The subspecies may also occur in extreme western Mineral County, Nevada, where a similar phenotype was observed (Austin and McGuire 1998; *see also* McGuire 1998: 463).

Conservation Status, Threats

NatureServe (2009) reviewed the Mono Basin skipper in 1999 and nationally ranked it as "critically imperiled." NatureServe (2009) also ranked the subspecies as "critically imperiled" in Nevada and the Nevada Natural Heritage Program listed the species as "at risk" (NNHP 2009). The Service identifies *Hesperia uncas* subspecies as "species of concern" (FWS 2009c) and previously designated them as a "category 2" candidate species under the Endangered Species Act (59 FR 58982). Rich (1999) included *Hesperia uncas* subspecies of Railroad Valley skipper in a comprehensive review of sensitive flora and fauna in sagebrush steppe.

The Mono Basin skipper is believed to be restricted to the Adobe Hills. Livestock grazing occurs in the Adobe Hills. Grazing reduces grasses and forbs in shrub-steppe, spreads invasive plants, increases woody shrubs, and facilitates conifer encroachment in shrub-steppe habitats. Conifer encroachment can convert shrubsteppe to woodland. This would be negative for Mono Basin skipper, which depends on *Stipa* sp. that grows in "open spaces created by the widely spaced shrubs" in the Adobe Hills (McGuire 1998: 462). Invasive plants spread by grazing fuel unnatural fire that also eliminates shrubsteppe.

Railroad Valley Skipper

Hesperia uncas fulvapalla (Austin and McGuire, 1998)

Classification and Nomenclature

Common Name. *Hesperia uncas fulvapalla* and at least two other *Hesperia uncas* subspp. from central Nevada are generally called "Railroad Valley skipper" (NatureServe 2009 and others). We refer to this subspecies as Railroad Valley skipper *fulvapalla* in this petition.

Taxonomy. The petitioned subspecies is *Hesperia uncas fulvapalla* (Austin and McGuire, 1998).

Table 11. Taxonomy of *Hesperia uncas fulvapalla*

Kingdom	Animalia
Phylum	Arthropoda
Class	Insecta
Order	Lepidoptera
Family	Hesperiidae
Genus	*Hesperia*
Species	*Hesperia uncas*
Subspecies	*Hesperia uncas fulvapalla*

Sources: NatureServe (2009); Integrated Taxonomic Information System, www.itis.gov.

Description, Life History, Distribution

Austin and McGuire (1998: 777) described Railroad Valley skipper *fulvapalla*:

> MALE. Forewing length = 16.7 mm (range = 16.1-17.0 mm). Dorsal wings yellow-orange (Yellow Ocher); forewing with indistinct and narrow blackish outer margin, often obsolete posteriorly, heavily overscaled with ground color; apical macules large, Chamois to Pale Horn Color; costa of ground color lightly overscaled with black and with black veins; other veins black; stigma narrow, black with silvery central line. Hindwing with black costa, overscaled with grond [sic] color; outer margin similar, very narrow or absent; some black scaling on anal margin; discal color slightly paler above ventral postmedian macules; veins occasionally black distally; fringes of both wings very pale gray.
>
> Ventral forewing Yellow ocher, very pale (Chamois to Pale Horn Color) posteriorly; Grayish Olive to Smoke Gray (color 45) about large white apical macules; black below stigma and at very base of wing. Hindwing Yellow Ocher; overscaled with black to appear Smoke Gray (color 45) postmedian and subbasal macules very large, white, indistinctly outlined with slightly darker Olive-Gray; veins white medially and to outer margin; anal margin Chamois to Pale Horn Color with slight black scaling basally.
>
> * * *
>
> FEMALE. Forewing length = 19.2 mm (range = 18.0-20.7 mm). Dorsal wing color as on male; no stigma; outer marginal black of forewing as on male ranging to obsolete; apical macules as on male or slightly larger, the series extending posteriorly onto disc and often one in discal cell; occasionally slight blackish wash posterior to discal cell. Hindwing as male; outer marginal black usually only terminal line; fringes of both wings very pale gray.
>
> Ventral surface as on male; slightly darker than ground color (Grayish Olive) in hindwing cells between postmedian and subbasal macules and at base of discal cell.

Photographs of pinned Railroad Valley skipper *fulvapalla* are posted at http://butterfliesofamerica.com/hesperia_uncas_fulvapalla.htm.

Once widespread, populations of *H. uncas* may have become isolated as the Great Basin warmed and was desiccated during the Holocene. The distinct subspecies *fulvapalla*, *grandiosa*, and *reeseorum* may have evolved from this isolation, lack of gene flow and founder effect (Austin and McGuire 1998). Phenotypic characteristics of the Railroad Valley skipper *fulvapalla* are similar to those of three other *Hesperia* spp. petitioned here (see Table 10). Genitalia characters of the four subspecies are also distinctive, as summarized in Austin and McGuire (1998: 784, Table 2).

While *Hesperia uncas* are known to use prairie and sagebrush steppe (NatureServe 2009, *citing* Scott 1986), subspecies in the Great Basin may depend on more limited habitats (B. Boyd, pers. comm.). Austin and McGuire (1998) described *Hesperia uncas fulvapalla* from alkali meadows on the floor of Railroad Valley in Nye County. The Nevada Natural Heritage Program noted that the Railroad Valley skipper *fulvapalla* is endemic to Nevada.[10]

[10] Interestingly, Austin and McGuire (1998) also reported *Hesperia uncas fulvapalla* from the Calleo area in Juab County, Utah. The butterfly is not further reported from this site in subsequent literature.

Railroad Valley is a large basin in east-central Nevada, approximately 80 miles in length and up to 20 miles wide. Most of the basin is located in Nye County. U.S. Highway 6 traverses the valley, southwest to northeast, connecting small communities, including Currant, Crows Nest, Green Springs, Lockes and Nyala. Most of Nevada's oil production comes from several small oil fields in Railroad Valley. The Railroad Valley includes a state WMA near Lockes, which consists of four units. It is unclear whether any of the units provide current or potential habitat for *Hesperia uncas fulvapalla.*

Conservation Status, Threats

NatureServe (2009) reviewed Railroad Valley skipper *fulvapalla* in 1999 and nationally ranked it as "critically imperiled." NatureServe (2009) also ranked the subspecies as "critically imperiled" in Nevada. The Service identifies *Hesperia uncas* subspecies as "species of concern" (FWS 2009c) and previously designated them as a "category 2" candidate under the Endangered Species Act (59 FR 58982). The BLM lists *Hesperia uncas* subspecies as "sensitive species" in Nevada (BLM 2007a). Rich (1999) included *Hesperia uncas* subspecies in a comprehensive review of sensitive flora and fauna in sagebrush steppe.

Austin (1985a) noted that *Hesperia* spp. appear restricted largely to the valley(s) where they occur in the Great Basin. Railroad Valley skipper *fulvapalla* (along with *H. u. grandiosa*, and *H. u. reeseorum*) belong to a group of pallid phenotypes that occur at alkaline and/or saltgrass flats or marshes on valley bottoms (Austin and McGuire 1998). Isolated populations of subsp. *fulvapalla* are less able to interconnect or disperse to suitable habitat, particularly where land use, water diversion and development, and/or climate change and other factors fragment habitat and hinder dispersal.

The Nevada Natural Heritage Program has recorded four occurrences of the Railroad Valley skipper *fulvapalla* in the Railroad Valley (NNHP 2009), all of them at important conservation sites identified by the program (NNHP 2006).

Table 12. Nevada Natural Heritage Program Conservation Sites with Recorded Occurrences of Railroad Valley Skipper (*fulvapalla*)

NNHP Site	Land Ownership (KNOWN)	Land Ownership (POSSIBLE)	County	Latest Year Observed / Site Surveyed
Currant	BLM Forest Service Private	State	Nye	1984
Duckwater Springs	BLM Duckwater Indian Reservation Private	BLM State	Nye	1984
Lockes	BLM State Private		Nye	1990

Source: NNHP (2006).

The Nevada Natural Heritage Program considers the Duckwater Springs and Lockes sites of "highest conservation priority," ranking them among the most important in the state for only known or highest quality populations of highly imperiled species (NNHP 2006). The program assigned both sites its highest ranks for "Site Protection Urgency" and "Site Management Urgency" (NNHP 2006). The rankings indicate the sites have a "[g]ood chance of being immediately threatened by severely destructive forces" and that species populations could experience "loss or irretrievable degradation…within 1 year without immediate new, or ongoing annual, management" (NNHP 2006: 14). The Currant site is listed as a "companion" conservation site associated with other, higher priority conservation sites (NNHP 2006).

The Nevada Natural Heritage Program also ranked Railroad Valley springs and marshes among the 26 highest priority wetland areas in the state (NNHP 2008). The program considers 80 percent of Railroad Valley springs and marshes to be degraded; the remainder has been converted to other land uses (NNHP 2008: 41). Water diversion/development, groundwater pumping, hydrogeomorphic modification, farming, and livestock grazing continue to threaten these habitats (NNHP 2008: 36).

Distribution of the Railroad Valley skipper *fulvapalla* may partially overlap the historic or current range of the Railroad Valley springfish (NNHP 2006). The springfish was listed as "threatened" under the Endangered Species Act in 1986 and critical habitat was designated for the fish (51 FR 10857). Although an aquatic species, the history of management of the springfish and its habitat in Railroad Valley may be instructive for understanding threats to the skipper, particularly the difficulty of managing isolated, endemic species in the face of stochastic environmental events (*see* Deacon Williams and Willams 1989, 51 FR 10857).

Greenwald and Bradley (2008) identified some portion of the Duckwater Indian Reservation as a "hot spot" for imperiled species in Nevada, but noted that less than 1 percent of the area is protected in a reserve (as defined by the authors and commonly defined by others).[11] We do not know if Railroad Valley skipper *fulvapalla* occurs within the small protected the area. The authors also identified part of the Railroad Valley as an imperiled species hot spot (perhaps the Currant site or the Lockes area), but noted that only about 5 percent of the area is protected in a reserve[12] (Greenwald and Bradley 2008). We do not know if the skipper occurs in the protected area.

Current proposals to pump groundwater in central Nevada would affect the Railroad Valley (Deacon et al. 2007). Simulations indicate that pumping could significantly lower water levels in the southern part of the basin, perhaps between 10-100 feet in 30 years (Schaeffer and Harrill 1995). Current water pumping, plus rights sought for future pumping, represent 265 percent of the estimated perennial yield of groundwater in Railroad Valley (Deacon et al. 2007). Proposed water development would likely affect spring discharge in the valley, including Duckwater Springs and Lockes Springs (Deacon et al. 2007), which may support habitat for *H. u. fulvapalla*. Oil development may also affect aquifers in the valley (*see* Deacon Williams and Williams 1989).

[11] Reserves included wilderness areas, wilderness study areas, national parks, national wildlife refuges, research natural areas, areas of critical environmental concern, national conservation areas and Nature Conservancy preserves (Greenwald and Bradley 2008: 2953). Notably, the authors did not include wildlife management areas or other state or local designations as reserves.

[12] The identified protected area may be critical habitat for the Railroad Valley springfish.

Railroad Valley skipper
Hesperia uncas reeseorum (Austin and McGuire, 1998)

Classification and Nomenclature

Common Name. *Hesperia uncas reeseorum* and at least two other *Hesperia uncas* subspp. from central Nevada are generally called "Railroad Valley skipper" (NatureServe 2009 and others). We refer to this subspecies as Railroad Valley skipper *reeseorum* in this petition.

Taxonomy. The petitioned subspecies is *Hesperia uncas reeseorum* (Austin and McGuire, 1998).

Table 13. Taxonomy of *Hesperia uncas reeseorum*

Kingdom	Animalia
Phylum	Arthropoda
Class	Insecta
Order	Lepidoptera
Family	Hesperiidae
Genus	*Hesperia*
Species	*Hesperia uncas*
Subspecies	*Hesperia uncas reeseorum*

Sources: NatureServe (2009); Integrated Taxonomic Information System, www.itis.gov.

Description, Life History, Distribution

Austin and McGuire (1998: 776) described Railroad Valley skipper *reeseorum*:

> MALE. Forewing length = 15.2 mm (range = 13.9-15.8 mm). Dorsal wings pale fulvous (Clay Color, color 123B); forewing margin blackish overscaled lightly with ground color (appearing brown), broadest at apex, latter with small yellowish (Warm Buff to Chamois) subapical and submarginal macules; costal margin narrowly blackish distally and often overscaled with ground color especially basally with black veins; other veins black distally; stigma broad, black with silvery central line. Hindwing with black costa and narrow outer margin, both overscaled with ground color; ground color paler above ventral postmedian macules; veins black at least distally; anal margin and wing base with some black scales; fringes of both wings very pale gray.
>
> Ventral forewing paler fulvous than dorsum (Yellow Ocher), paler yet posteriorly (Chamois); outer margin near Olive-Gray to Smoke Gray (color 45); apical macules white; area beneath stigma and wing base black; hindwing olive-green (Lime Green to Smoke Gray, color 45); narrow postmedian and subbasal macules white, margined on both sides with dark greenish Olive; similar color at base of discal cell; veins white medially, this extending distally but not to outer margin; anal margin Buff Yellow to Sulphur Yellow with black scaling basally.

* * *

FEMALE. Forewing length = 18.2 mm (range = 17.2-19.0 mm). Dorsal wing color and markings similar to male (no stigma); outer margin broader, this often extending to lower edge of discal cell; apical macules pale (Chamois), these extending posteriorly onto disc; often similar macule distad in discal cell. Hindwing more overscaled with black than on male, thus postmedian pale areas more distinct; fringes of both wings very pale gray.

Ventral surface similar to male but more blackish medially on forewing; forewing apical macules and hindwing postmedial macules larger; white on veins on hindwing often extending to outer margin; anal margin Lime Green to Smoke Gray (color 44).

Photographs of live and pinned Railroad Valley skipper *reeseorum* are posted at http://butterfliesofamerica.com/hesperia_uncas_reeseorum.htm.

Once widespread, populations of *H. uncas* may have become isolated as the Great Basin warmed and was dessicated during the Holocene. The distinct subspecies *fulvapalla*, *grandiosa*, and *reeseorum* may have evolved from this isolation, lack of gene flow and founder effect (Austin and McGuire 1998). Phenotypic characteristics of the Railroad Valley skipper *reeseorum* are similar to those of three other *Hesperia* spp. petitioned here (see Table 10). Genitalia characters of the four subspecies are also distinctive, as summarized in Austin and McGuire (1998: 784, Table 2).

The Railroad Valley skipper *reeseorum* is named after the Reese River Valley in Lander County, where it was described by Austin and McGuire (1998). While *Hesperia uncas* are known to use prairie and sagebrush steppe (NatureServe 2009, *citing* Scott 1986), subspecies in the Great Basin may depend on more limited habitats (B. Boyd, pers. comm.). The type locality is an extensive alkali flat dominated by saltgrass (*Distichlis* spp.) (Austin and McGuire 1998). Adults were seen visiting a thistle (*Cirsium*) for nectar (Austin and McGuire 1998), and apparently use *Sporobolus airoides* (alkali sacaton) as its hostplant (Austin and Leary 2008). The subspecies *reeseorum* was also reported from alkaline, saltgrass habitat in Mason Valley in Lyon County (Austin and McGuire 1998).

Conservation Status, Threats

NatureServe (2009) reviewed Railroad Valley skipper *reeseorum* in 1999 and assigned it a rounded national rank of "critically imperiled." NatureServe (2009) also ranked the subspecies as "critically imperiled" in Nevada. The Service identifies *Hesperia uncas* subspecies as "species of concern" (FWS 2009c) and previously designated them as a "category 2" candidate under the Endangered Species Act (59 FR 58982). Rich (1999) included *Hesperia uncas* subspecies in a comprehensive review of sensitive flora and fauna in sagebrush steppe.

Austin (1985a) noted that *Hesperia* spp. appear restricted largely to the valley(s) where they occur in the Great Basin. Railroad Valley skipper *reeseorum* (along with *H. u. fulvapalla* and *H. u grandiosa*) belong to a group of pallid phenotypes that occur at alkaline and/or saltgrass flats or marshes on valley bottoms (Austin and McGuire 1998). Isolated populations of subsp. *reeseorum* are less able to interconnect or disperse to suitable habitat, particularly where land use, water diversion and development, and/or climate change and other factors fragment habitat and hinder dispersal.

The Nevada Natural Heritage Program ranked the Mason Valley/Walker River riparian zone among the 26 highest priority wetland areas in the state (NNHP 2008). The program also identified marshes, ponds, playas and ephemeral pools in the Mason Valley as priority areas (NNHP 2008). Most of the riparian habitat along the Walker River is converted to other land uses, and the remaining habitat is considered degraded (NNHP 2008: 38). Saltgrass and alkali sacaton (the butterfly's hostplant) are used for livestock grazing (Newman and Gates 2006, Favorite 2003). Priority wetlands in the Mason Valley (including the Wildlife Management Area) are variously threatened by water diversion/development, groundwater pumping, hydrogeomorphic modification, and livestock grazing (NNHP 2008: 38-39).

The Nevada Natural Heritage Program also identified several segments of the Reese River and associated habitats as "priority wetland areas" (NNHP 2008). Many of the areas are significantly degraded or converted to other land uses (NNHP 2008: 41). Water diversion/development, groundwater pumping, hydrogeomorphic modification, farming, and livestock grazing continue to threaten these habitats (NNHP 2008: 41).

It is unknown if the Railroad Valley skipper *reeseorum* occurs at Mason Valley WMA, although the area does contain significant "alkali desert scrub." Livestock grazing is periodically allowed, and farming and prescribed burning are used on the wildlife management area to improve wildlife habitat. However, these activities might also destroy or degrade butterfly habitat. Alkali Lake WMA is also located in the vicinity of the Mason Valley sighting. It is unknown if Alkali Lake WMA provides habitat for var. *reeseorum.*

Steptoe Valley crescentspot
Phyciodes cocyta arenacolor (Austin, 1998)

Classification and Nomenclature

Common Name. *Phyciodes cocyta arenacolor* is known as the "Steptoe Valley crescentspot" (NNHP 2009 and others), and is occasionally called "Steptoe Valley checkerspot." We refer to the subspecies as the Steptoe Valley crescentspot in this petition.

Taxonomy. The petitioned subspecies is *Phyciodes cocyta arenacolor* Austin, 1998.

NatureServe (2009) noted that this subspecies has been classified as both *Phyciodes cocyta arenacolor* and *Phyciodes pascoensis arenacolor.* NatureServe and others classify the subspecies as *P. cocyta arenacolor*, following recently updated nomenclature (A. Warren, pers. comm.), while Austin (1998a, 1998d) and others classified the butterfly as *P. pascoensis arenacolor* (*e.g.,* Nevada Natural Heritage Program (2006); the Service (59 FR 58982), "*Phyciodes pascoensis* spp."); and BLM (2007), "*Phyciodes pascoiensis* [sic] *arenacolor*").

Table 14. Taxonomy of *Phyciodes cocyta arenacolor*	
Kingdom	Animalia
Phylum	Arthropoda
Class	Insecta
Order	Lepidoptera
Family	Nymphalidae
Genus	*Phyciodes*
Species	*Phyciodes cocyta*
Subspecies	*Phyciodes cocyta arenacolor*
Sources: NatureServe (2009); Integrated Taxonomic Information System, www.itis.gov.	

Description, Life History, Distribution

Austin (1998d: 577) described Carson Valley silverspot:

> MALE. Size = 18.2 [mm] (17.0-18.8 [mm]). Dorsum orange (near Spectrum Orange) and black; margin broadly black with marginal spot in cell M_3–CuA_1; submargin broadly connected with slightly paler yellow-orange postmedian (separated only by thin incomplete line of blackish lunules), postmedian separated narrowly centrally and more broadly anteriorly and posteriorly from median and basal areas, latter marked with several thin black lines. Hindwing with broad black margin, this with thin indistinct, somewhat grayish lunules especially posteriorly; submargin with series of bold black dots, submargin not separated from postmedian orange; basal area orange with thin black lines; veins black distally, usually not so basally; fringes of both wings dark grayish, indistinctly checkered with white.
>
> Ventral forewing ground color paler (yellower) than on dorsum; margin and submargin brownish, interrupted by yellow in cell M_3-CuA_1 and some yellowish near apex usually as yellowish submarginal lunules; black patch near tornus and another subapically on costa; median black area from costa to inner margin as on dorsum; basal portion of wing with irregular brown lines. Hindwing yellowish (Chamois to Warm Buff); small brownish patch subapically and along middle of outer margin, the latter with distinct pale (often whitish) submarginal crescent in cell M3-CuAI; row of usually distinct blackish dots proximal to this, largest in cell M_3-CuA_1 and decreasing in size anteriorly and posteriorly; basal 2/3 of wing with several indistinct redbrown lines.
>
> FEMALE. Size = 19.2 [mm] (18.2-20.0 [mm]). Dorsum paler orange than male with forewing postmedian Cream Color and submargin creamy-orange; black more extensive than on male, completely separating distal pale areas and dark overscaling obscuring much of basal orange. Hindwing like male but black broader, separating rows of pale spots.
>
> Ventral forewing similar to male but postmedian pale as on dorsum, giving bicolored aspect; ventral hindwing whitish with markings of male, these darker and more extensive.

Photographs of pinned Steptoe Valley crescentspot are posted at http://butterfliesofamerica.com/phyciodes_cocyta_arenacolor.htm.

Austin (1998d: 577) discovered the Steptoe Valley crescentspot at Monte Neva Hot Springs, in a "broad and often wet valley bottom" in White Pine County. The Nevada Natural Heritage Program noted that the Steptoe Valley crescentspot is endemic to Nevada and has recorded three occurrences of the subspecies in the state (NNHP 2009), one at Monte Neva Hot Springs and two at a site near McGill (NNHP 2006). The subspecies was last observed at these locations in 1993 (NNHP 2006). Adults apparently fly from early July to mid August (Austin 1998d).

Both Monte Neva Hot Springs and the McGill site are on BLM and private land, between 5940-6,220 feet elevation (NNHP 2006). The habitats are described as wetlands (B. Boyd, pers. comm.).

Conservation Status, Threats

NatureServe (2009) reviewed Steptoe Valley crescentspot in 1998 and nationally ranked the subspecies as "critically imperiled." NatureServe (2009) also ranked the subspecies as "critically imperiled" in Nevada. The Service identifies the Steptoe Valley crescentspot as a "species of concern" (FWS 2009c) and previously designated it as a "category 2" candidate species under the Endangered Species Act (59 FR 58982). The BLM lists the butterfly as a "sensitive species" in Nevada (BLM 2007a). Wisdom et al. (2005: App. 2, Table A2.6) identified the Steptoe Valley crescentspot as a species of conservation concern. Rich (1999) also included the subspecies in a comprehensive review of sensitive flora and fauna in sagebrush steppe.

The Nevada Natural Heritage Program considers Monte Neva Hot Springs of "highest conservation priority," ranking the site among the most important in the state for only known or highest quality populations of highly imperiled species (NNHP 2006). The program also assigned the site its highest ranks for "Site Protection Urgency" and "Site Management Urgency" (NNHP 2006). The rankings indicate the site has a "[g]ood chance of being immediately threatened by severely destructive forces" and that species populations could experience "loss or irretrievable degradation…within 1 year without immediate new, or ongoing annual, management" (NNHP 2006: 14). The McGill site is listed as a "companion" conservation site associated with other, higher priority conservation sites (NNHP 2006).

There are many important wetland habitats in the Steptoe Valley. The Nevada Natural Heritage Program ranked the Duck Creek area, Basset Lake, and Basset Slough riparian meadow in Steptoe Valley as three of the 26 highest priority wetland areas in the state (NNHP 2008). Multiple other sites in the Steptoe Valley are also listed as priority wetland areas, including springs, a marsh, small ponds and Commins Lake on the Steptoe Valley WMA (NNHP 2008: 42). The degraded condition of many of these sites is an indication that wetlands in Steptoe Valley are mismanaged, which may threaten the Steptoe Valley crescentspot. Deacon (2009, newsletter) noted that proposed groundwater pumping in the region could lower water tables in the Steptoe Valley, which could negatively affect spring-fed habitats.

White River Valley skipper
Hesperia uncas grandiosa (Austin and McGuire, 1998)

Common Name. *Hesperia uncas grandiosa* and at least two other *Hesperia uncas* subspp. from central Nevada are generally called "Railroad Valley skipper" (NatureServe 2009 and others). However, the *grandiosa* subsp. is also called "White River Valley skipper" (NNHP 2009), the name we use in this petition to differentiate it from other *Hesperia uncas* subspp.

Taxonomy. The petitioned subspecies is *Hesperia uncas grandiosa* (Austin and McGuire, 1998).

Table 15. Taxonomy of *Hesperia uncas grandiosa*	
Kingdom	Animalia
Phylum	Arthropoda
Class	Insecta
Order	Lepidoptera
Family	Hesperiidae
Genus	*Hesperia*
Species	*Hesperia uncas*
Subspecies	*Hesperia uncas grandiosa*
Sources: NatureServe (2009); Integrated Taxonomic Information System, www.itis.gov.	

Description, Life History, Distribution

Austin and McGuire (1998: 778) described White River Valley skipper:

> MALE. Forewing length = 16.8 mm (range = 16.0-17.6 mm). Dorsal wings pale fulvous (Clay Color, color 123B); forewing margin blackish overscaled moderately with ground color (appearing brown), broadest at apex, often becoming obsolete posteriorly; apex with relatively large yellowish (Warm Buff to Trogon Yellow) macules; costal margin narrowly blackish distally and often overscaled with ground color especially basally, black veins; other veins black distally; stigma broad, black with silver central line. Hindwing with black costa and narrow outer margin, latter occasionally reduced to terminal line, both overscaled with ground color; ground color paler above ventral postmedian macules; veins black at least distally; anal margin and wing base with some black scales; fringes of both wings very pale gray.
>
> Ventral forewing paler than dorsum (Yellow Ocher), still paler posteriorly (Pale Horn Color); outer margin Olive-Gray to Smoke Gray (color 45); apical macules white; area beneath stigma and wing base black; hindwing olive (Olive Gray to Smoke Gray, color 45) over Buff Yellow ground color; postmedian and subbasal macules white, very broad, margined narrowly on both sides (except basad on cell M_1-M_2) with dark Grayish Olive; cells M_2-M_3 through CuA_1-CuA_2 of similar color between postmedian and subbasal macules and at base of discal cell; veins white medially and extending to outer margin; anal margin Buff Yellow to Sulphur Yellow with black scaling basally.

* * *

> FEMALE. Forewing length = 19.7 mm (range = 18.8-20.7 mm). Dorsal wing color and markings similar to male but darker due to black overscaling; no stigma; outer margin broader, this often extending to lower edge of discal cell; apical macules paler (Chamois to Pale Horn Color), these extending posteriorly onto disc; often similar macule distad in discal cell. Hindwing more overscaled with black than on male, thus postmedian pale areas more distinct; fringes of both wings very pale gray.
>
> Ventral surface similar to male but more blackish medially on forewing; hindwing postmedial macules larger; white on veins of hindwing usually extending to outer margin.

Photographs of live and pinned White River Valley skipper are posted at http://butterfliesofamerica.com/hesperia_uncas_grandiosa.htm.

Once widespread, populations of *H. uncas* may have become isolated as the Great Basin warmed and was dessicated during the Holocene. The distinct subspecies *fulvapalla*, *grandiosa*, and *reeseorum* may have evolved from this isolation, lack of gene flow and founder effect (Austin and McGuire 1998). Phenotypic characteristics of the White River Valley skipper are similar to those of three other *Hesperia* spp. petitioned here (see Table 10). Genitalia characters of the four subspecies are also distinctive, as summarized in Austin and McGuire (1998: 784, Table 2).

While *Hesperia uncas* are known to use prairie and sagebrush steppe (NatureServe 2009, *citing* Scott 1986), subspecies in the Great Basin may depend on more limited habitats (B. Boyd, pers. comm.). Austin and McGuire (1998) described *Hesperia uncas grandiosa* using alkaline meadows and saltgrass flats in early summer in the White River Valley. Austin and Leary (2008) also documented the subspecies using its apparent hostplant, *Juncus mexicanus* (Mexican rush), in Big Smoky Valley in Nye County in 1984.

Conservation Status, Threats

NatureServe (2009) reviewed White River Valley skipper in 2005 and nationally ranked it as "critically imperiled." NatureServe (2009) also ranked the subspecies as "critically imperiled" in Nevada and reported total population at 1,000-2,500 individuals. The Service identifies subspecies of Railroad Valley skipper as "species of concern" (FWS 2009c) and previously designated them as a "category 2" candidate species under the Endangered Species Act (59 FR 58982). Rich (1999) included subspecies of Railroad Valley skipper in a comprehensive review of sensitive flora and fauna in sagebrush steppe.

White River Valley skipper (along with *H. u. fulvapalla* and *H. u reeseorum*) belong to a group of pallid phenotypes observed at alkaline and/or saltgrass flats or marshes on valley bottoms (Austin and McGuire 1998). Austin (1985a) noted that *Hesperia* spp. appear restricted largely to the valley(s) where they occur in the Great Basin. Isolated populations of subsp. *grandiosa* are probably unable to interconnect or disperse to other locations. *H. u. grandiosa* is threatened by drought, grazing, rechannelization of the White River and water development in the valley(s) where it occurs (NatureServe 2009). Much of the White River Valley is privately owned; populations of *H. u. grandiosa* are not considered adequately protected and managed (NatureServe 2009).

The Nevada Natural Heritage Program noted that the White River Valley skipper is endemic to Nevada and has recorded one occurrence of the subspecies in the state (NNHP 2009), at Ruppes Place/Boghole in the White River Valley in White Pine and Nye counties (NNHP 2006). Ruppes Place/Boghole is on BLM, state and private land and ranges from 5,150-5,320 feet in elevation (NNHP 2006).

The Nevada Natural Heritage Program considers Ruppes Place/Boghole of "highest conservation priority," ranking the site among the most important in the state for only known or highest quality populations of highly imperiled species (NNHP 2006). In addition, the program assigned Ruppes Place/Boghole its highest ranks for "Site Protection Urgency" and "Site Management Urgency" (NNHP 2006). The rankings indicate the site has a "[g]ood chance of being immediately threatened by severely destructive forces" and that species populations could experience "loss or irretrievable degradation…within 1 year without immediate new, or ongoing annual, management" (NNHP 2006: 14).

The Nevada Natural Heritage Program also identified sites in both upper and lower White River Valley, including Ruppes Place/Boghole, as "priority wetland areas" (NNHP 2008). Springs and brooks in the upper White River (including Ruppes Place/Boghole) have been severely impacted: 25 percent of these habitats has been eliminated, 15 percent are degraded, and 10 percent have been converted to other land uses (NNHP 2008: 44). These areas are threatened by water diversion/development, groundwater pumping, hydrogeomorphic modification, farming and livestock grazing (NNHP 2008: 44).

Proposed groundwater withdrawal in the Cave, Dry Lake and Delamar valleys, if permitted, is predicted to reduce flow to springs in southern White River Valley by 50 percent in 15 years (Deacon 2007, unpublished report, *citing* Myers 2007). This would have significant negative effects on spring-fed habitats in the valley (Deacon 2007, unpublished report). *Juncus mexicanus*, the apparent hostplant for White River Valley skipper, grows in moist habitats. It is also moderately palatable to domestic livestock and native ungulates (USDA-NRCS Plants Database).

Several wetland habitats in the northern Big Smoky Valley have also been identified as high priority wetlands in Nevada with moderate to high conservation value (NNHP 2008). A complex of sites, including Charnock Springs, Darrough's Hot Springs, and an alkali flat, may support habitat like that from which Austin and McGuire (1998) reported White River Valley skipper in Big Smoky Valley. The Nevada Natural Heritage Program reported that 50 percent of these sites have been degraded or converted to other land uses, and that water diversion/development, groundwater pumping, hydrogeomorphic modification, land development, farming, livestock grazing, mining, non-native species, and energy development continue to threaten these habitats (NNHP 2008: 35).

C. ESA Listing Factor Analysis for Petitioned Great Basin Butterflies

The ESA sets forth listing factors under which a species can qualify for protection (16 U.S.C. § 1533(a)(1). A taxon need only meet one of the listing criteria outlined in the ESA to qualify for federal listing. The petitioned butterflies each meet one or more of the ESA listing criteria.

Table 16. ESA Listing Factor Analysis for Petitioned Great Basin Butterflies					
Species	**Listing Factor A: Habitat Loss and Degradation**	**Listing Factor B: Over-utilization**	**Listing Factor C: Disease**	**Listing Factor D: Inadequate Regulatory Mechanisms**	**Listing Factor E: Other Natural or Man-made Factors**
Baking Powder Flat blue butterfly	Groundwater withdrawal, effects from livestock grazing; habitat loss from various factors.			No federal or state regulatory protection.	NatureServe G1/N1; one known population, small habitat; climate change.
Bleached sandhill skipper				No federal or state regulatory protection.	NatureServe G1/N1; one known population, small habitat.
Carson Valley silverspot	Land development, livestock grazing, invasive species, agriculture, groundwater withdrawal.			No federal or state regulatory protection.	NatureServe G1/N1; reduced populations.
Carson Valley wood nymph	Land development, livestock grazing, invasive species, agriculture, groundwater withdrawal.			No federal or state regulatory protection.	NatureServe G2/N2; reduced populations.
Mattoni's blue butterfly				No federal or state regulatory protection.	NatureServe G1/N1; limted range.
Mono Basin skipper	Livestock grazing and associated effects.			No federal or state regulatory protection.	NatureServe G1/N1; one known population, small habitat; climate change.
Railroad Valley skipper (*fulvapalla*)	Severe habitat loss and degradation from agriculture, livestock grazing and other factors; groundwater withdrawal.			No federal or state regulatory protection.	NatureServe G1/N1; two populations; climate change.
Railroad Valley skipper (*reeseorum*)	Livestock grazing, agriculture, ground-water withdrawal.			No federal or state regulatory protection.	NatureServe G1/N1·2; two populations; climate change.
Steptoe Valley crescentspot	Habitat loss and degradation from multiple factors; groundwater withdrawal.			No federal or state regulatory protection.	NatureServe G1/N1; two populations, limited range; climate change.
White River Valley skipper	Habitat loss and degradation from multiple factors; land development; ground-water withdrawal.			No federal or state regulatory protection.	NatureServe G1/N1; two populations(?); climate change.

V. Request for Listing under the Endangered Species Act

Hoffman Black and Vaughan (2003) considered listing imperiled insects as "endangered" or "threatened" under the Endangered Species Act as "vital" to their protection and effective for protecting their habitat. Listing may be especially important for rare, endemic insects and/or habitat specialists due to their anonymity and their dependence on limited or micro-habitats (Dunn 2005). However, despite all its vaunted strength as a biodiversity protection statute, the ESA does nothing to protect a species unless it is first listed under the Act. Listing is the critical first step in the ESA's system of species protection.

WildEarth Guardians petitions the U.S. Fish and Wildlife Service in the U.S. Department of Interior to list Baking Powder Flat blue butterfly (*Euphilotes bernardino minuta*), Bleached sandhill skipper (*Polites sabuleti sinemaculata*), Carson Valley silverspot (*Speyeria nokomis carsonensis*), Carson Valley wood nymph (*Cercyonis pegala carsonensis*), Mattoni's Blue Butterfly (*Euphilotes pallescens mattonii*), Mono Basin Skipper (*Hesperia uncas giulianii*), Railroad Valley Skipper (*Hesperia uncas fulvapalla*), Railroad Valley skipper (*Hesperia uncas reeseorum*), Steptoe Valley crescentspot (*Phyciodes cocyta arenacolor*), and White River Valley skipper (*Hesperia uncas grandiose*) as "endangered" or "threatened" under the ESA. Protecting these butterflies under the act is warranted, given their small populations, limited range and the threats they face.

VI. Request for Designation of Critical Habitat

WildEarth Guardians requests that the Service designate critical habitat for these butterflies concurrent with final ESA listing. Critical habitat should be sufficiently large to stabilize and recover butterfly populations, support their complete life cycle, and buffer them from harmful land uses and other impacts (*see* Sanford 2006). Greenwald and Bradley (2008) noted that protecting key habitats in Nevada can effectively conserve entire assemblages of sensitive species.

VII. References

51 Fed. Reg. 10857 (Mar. 31, 1986) (Endangered and Threatened Wildlife and Plants: Determination of Threatened Status of Threatened and Critical Habitat for the Railroad Valley Springfish).

59 Fed. Reg. 58982 (Nov. 15, 1994) (Animal Candidate Review of Listing as Endangered or Threatened Species).

72 Fed. Reg. 24253 (May 2, 2007) (Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to List the Sand Mountain Blue Butterfly (*Euphilotes pallescens* ssp. *arenamontana*) as Threatened or Endangered with Critical Habitat).

72 Fed. Reg. 67748 (Nov. 30, 2007) (Notice of Availability of the Proposed Resource Management Plan and Final Environmental Impact Statement for the Ely Field Office, Nevada).

73 Fed Reg. 55867 (Sept. 26, 2008) (Notice of Availability: Record of Decision for the Ely Resource Management Plan/Environmental Impact Statement, Nevada).

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