



Billing Code 4310-55-P

## **DEPARTMENT OF THE INTERIOR**

### **Fish and Wildlife Service**

#### **50 CFR Part 17**

**[Docket No. FWS-R4-ES-2011-0012]**

**[4500030113]**

### **Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to List the Bay Skipper as Endangered or Threatened**

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Notice of 12-month petition finding.

**SUMMARY:** We, the U.S. Fish and Wildlife Service (Service), announce a 12-month finding on a petition to list the Bay skipper (*Euphyes bayensis*) as an endangered or threatened species under the Endangered Species Act of 1973, as amended, and to designate critical habitat. After review of the best available scientific and commercial

information, we find that listing the Bay skipper is not warranted at this time. However, we ask the public to submit to us any new information that becomes available concerning the threats to the Bay skipper or its habitat at any time.

**DATES:** The finding announced in this document was made on [INSERT DATE OF FEDERAL REGISTER PUBLICATION].

**ADDRESSES:** This finding is available on the Internet at <http://www.regulations.gov> at Docket Number **FWS–R4–ES-2011-0012**. Supporting documentation we used in preparing this finding is available for public inspection, by appointment, during normal business hours at the U.S. Fish and Wildlife Service, Mississippi Field Office, 6578 Dogwood View Parkway, Jackson, MS 39213. Please submit any new information, materials, comments, or questions concerning this finding to the above address.

**FOR FURTHER INFORMATION CONTACT:** Stephen Ricks, Mississippi Field Office (see **ADDRESSES**); by telephone 601-321-1122, or by facsimile 601-965-4340. If you use a telecommunications device for the deaf (TDD), please call the Federal Information Relay Service (FIRS) at 800–877–8339.

## **SUPPLEMENTARY INFORMATION:**

### **Background**

Section 4(b)(3)(B) of the Act (16 U.S.C. 1531 *et seq.*), requires that, for any petition to revise the Federal Lists of Endangered and Threatened Wildlife and Plants that contains substantial scientific or commercial information that listing the species may be warranted, we make a finding within 12 months of the date of receipt of the petition. In this finding, we will determine that the petitioned action is: (1) not warranted, (2) warranted, or (3) warranted, but the immediate proposal of a regulation implementing the petitioned action is precluded by other pending proposals to determine whether species are threatened or endangered, and expeditious progress is being made to add or remove qualified species from the Federal Lists of Endangered and Threatened Wildlife and Plants. We must publish these 12-month findings in the **Federal Register**.

*Previous Federal Actions:*

The Bay skipper was identified as a candidate for protection under the Act in the November 21, 1991, **Federal Register** (56 FR 58804). It was assigned a Category 2 status designation, which was given to those species for which there was some evidence of vulnerability, but for which additional biological information was needed to support a proposed rule to list as an endangered or threatened species. Assigning categories to candidate species was discontinued in 1996 (Notice of Candidate Review; February 28, 1996; 61 FR 7596), and only species for which the Service has sufficient information on biological vulnerability and threats to support issuance of a proposed rule are now regarded as candidate species. Due to a lack of information on the Bay skipper, it was no longer considered as a candidate species as of 1996.

On January 4, 2010, we received a petition dated December 29, 2009, from WildEarth Guardians and Xerces Society for Invertebrate Conservation requesting that the Bay skipper be listed as an endangered or threatened species and critical habitat be designated under the Act. The petition clearly identified itself as such and included the requisite identification information for the petitioners, as required by 50 CFR 424.14(a). In a January 25, 2010, letter to the petitioners, we acknowledged receipt of the petition, and stated that due to prior workload and limited funding, we would not be able to address the petition at that time, but would complete the action when workload and funding allowed. On May 6, 2010, we received a 60-day notice of intent (NOI) to sue under the provisions of the Act from petitioners for our alleged failure to make a finding within 90 days of receipt of the petition. In a June 11, 2010, letter to the petitioners, we acknowledged receipt of the NOI and stated that a publication date for the 90-day finding could not be predicted at that time. Funding became available during fiscal year 2011, and on July 12, 2011, we published a 90-day finding (76 FR 40868) that the petition presented substantial scientific or commercial information indicating that listing this species may be warranted, and requested scientific and commercial data and other information regarding this species. This notice constitutes the 12-month finding on the January 4, 2010, petition to list the Bay skipper as an endangered species.

#### *Species Information*

The Bay skipper, a small butterfly, was described as *Euphyes bayensis* by Shuey (1989) from Bay St. Louis, Hancock County, Mississippi. Shuey (1993) reported on the phylogeny (the history of the evolution of a species) within the *Euphyes* genus, finding that *E. bayensis* is a species in the *Euphyes dion* complex. During our status review, we received comments from Texas Parks and Wildlife Department (TPWD) questioning the taxonomic validity of the Bay skipper, particularly the lack of quantitative morphological studies of Texas populations (TPWD 2011). While we agree that additional studies would be useful, the species has been appropriately described, and all subsequent peer-reviewed taxonomic treatments and collection accounts consider the taxon as valid (e.g., Gatrell 2000, p. 4; Pelham 2008, p. 93; Marks 2011a, pp. 92-94).

The Bay skipper has a wingspan of 1.5 to 1.75 inches (in) (3.7 to 4.4 centimeters (cm)). Males are black with a large orange patch on the top of the wings, and have a prominent black stigma (defined mark) on the forewing. The females are dark brown with yellow spots on their forewing and a yellow streak on their hindwing. The ventral (bottom) sides of both front and hind wings of the females are a shade of brown that is paler than the dorsal (upper) side, and have pale yellow spots on the forewing, with two yellow streaks from the base to the margin (Shuey 1989, p. 165; Vaughan and Shepherd 2005, pp. 1-2; Butterflies and Moths of North America (BMNA) 2009, p. 1). The Bay skipper is similar in appearance to the Dion skipper (*Euphyes dion*), but is distinguished by a brighter shade of orange and narrower black borders on the dorsal (top) side of the wings (Shuey 1989, p. 166).

The life history and habitat requirements of the Bay skipper are poorly known. Bay skippers appear to have two major flight periods (late spring and fall), and the potential to produce two generations per year. The gap between the flight periods suggests that the larvae produced during the spring flight period may aestivate (become dormant) in the summer. The species may overwinter (hibernate) in the larval form. Aestivating and hibernating larvae are probably in the third or fourth instar (period between molts) (Vaughan and Shepherd 2005, p. 2).

Bay skippers have been observed only in association with estuarine herbaceous marsh, including brackish and freshwater marshes. The larval food plant is unknown, but *Cladium* sp. (sawgrass), *Phragmites* sp. (reeds), and *Schoenopletus* sp. (bulrush) are potential larval host plants (NatureServe 2009 as cited in WildEarth Guardians and Xerces Society for Invertebrate Conservation, p. 7; Salvato 2011, p. 14). Adults have been observed feeding on a variety of nectar-producing plants adjacent to wetlands, including *Solidago* sp. (goldenrod), *Verbena brasiliensis* (Brazilian vervain), and *Lippia* sp. (frog fruit) (Marks 2011a, pp. 92-94; Marks 2011b).

Until recently, the Bay skipper was considered to occur in only two locations: Bay St. Louis, Hancock County, Mississippi, and the Anahuac National Wildlife Refuge (NWR) (part of the Texas Chenier Plains NWR Complex), Chambers and Jefferson Counties, Texas. The lack of records suggested that the species had a very limited range and was very rare (Vaughan and Shepherd 2005, p. 2; NatureServe 2009, 2011). The Bay St. Louis locality was severely damaged by Hurricane Katrina in 2005, and it was

unknown if the species continued to survive in that locality. The Anahuac NWR and surrounding areas were inundated by Hurricane Ike in 2008, and no Bay skippers had since been reported at that location (NatureServe 2011, WildEarth Guardians and Xerces Society for Invertebrate Conservation 2009, p. 9).

As part of the status review following the 90-day finding, we contacted lepidopterists along the Gulf Coast for additional records, photographs, specimens, and other information on the distribution and abundance of the Bay skipper. We also conducted a 1-week survey for the Bay skipper at the two known localities, and other potentially suitable habitat along the Gulf Coast between Galveston Bay, Texas, and Sandestin, Florida (Salvato 2011 pp. 1-28). No Bay skippers were found on the Anahuac NWR, or at the type locality in Bay St. Louis. However, we were able to identify seven additional localities where Bay skippers have been recently sighted, two in Texas and five in Cameron Parish, Louisiana. These new localities were documented by publication (Gatrelle 2000, p. 4; Marks 2011a, pp. 92-94; Marks 2011b; Salvato 2011, p. 15), photographs, pinned specimens, and observation of the species during the 2011 survey (Salvato 2011 pp. 1-14). Recent sightings at an additional three locations in Cameron Parish, Louisiana, were unconfirmed (Salvato 2011, pp. 1-3). All of the new confirmed sites are within or adjacent to wildlife refuges (Texas Point NWR, Sabine NWR, Cameron Prairie NWR, Rockefeller Wildlife Refuge), a State park (Sea Rim State Park), or a nature center (Baytown Nature Center) (Salvato 2011, pp. 1-14).

Our survey and our review of the best available scientific and commercial information demonstrates that efforts to document the Bay skipper have been limited and localized, and the Bay skipper is more widely distributed than previously believed (Salvato 2011, pp. 1-14; Marks 2011a, pp. 92-94). It is likely that additional populations occur along the Gulf Coast, as extensive and apparently suitable estuarine marsh habitats with appropriate nectar and potential host plants were observed at numerous sites on both public and private lands (Salvato 2011, pp. 1-14). Within the currently known range of the Bay skipper (East Texas to Mississippi), there are 10 national wildlife refuges, seven State wildlife refuges, two State parks, one State wetland conservation area, and one national park that contain, protect, and manage for estuarine marsh habitats known to be occupied, or potentially occupied, by the species. Extensive areas of privately owned estuarine marsh habitats are also present, and such habitats are not conducive to development, farming, or other land use practices potentially detrimental to Bay skipper habitat.

### **Summary of Information Pertaining to the Five Factors**

Section 4 of the Act and its implementing regulations at 50 CFR 424 set forth the procedures for adding a species to, or removing a species from, the Federal Lists of Endangered and Threatened Wildlife and Plants. Under section 4(a)(1) of the Act, a species may be determined to be an endangered or threatened species based on any of the following five factors:

(A) The present or threatened destruction, modification, or curtailment of its 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.

In making this finding, information pertaining to the Bay skipper in relation to the five factors provided in section 4(a)(1) of the Act is discussed below. In considering what factors might constitute threats, we must look beyond the mere exposure of the species to the factor to determine whether the species responds to the factor in a way that causes actual impacts to the species. If there is exposure to a factor, but no response, or only a positive response, that factor is not a threat. If there is exposure and the species responds negatively, the factor may be a threat and we then attempt to determine how significant a threat it is. If the threat is significant, it may drive or contribute to the risk of extinction of the species such that the species warrants listing as threatened or endangered as those terms are defined by the Act. This does not necessarily require empirical proof of a threat. The combination of exposure and some corroborating evidence of how the species is likely impacted could suffice. The mere identification of factors that could impact a species negatively is not sufficient to compel a finding that listing is appropriate; we require evidence that these factors are operative threats that act on the species to the point that the species meets the definition of a threatened or endangered species under the Act.

In making our 12-month finding on the petition, we considered and evaluated the best available scientific and commercial information.

*A. The Present or Threatened Destruction, Modification, or Curtailment of the Species'*

*Habitat or Range*

Until recently, the Bay skipper was recognized as occurring in only two localized areas: Bay St. Louis, Mississippi, and the Anahuac NWR, Texas (e.g., Vaughan and Shepherd 2005, pp. 1-2; NatureServe 2011). Habitat for the Bay St. Louis, Mississippi, population of the Bay skipper was severely damaged by Hurricane Katrina in 2005, and the Anahuac NWR, Texas, population was inundated by Hurricane Ike in 2008. There was concern that one or both of these populations of the Bay skipper might have been extirpated due to habitat loss or modification by the hurricane activity (WildEarth Guardians and Xerces Society for Invertebrate Conservation 2009, p. 9), and there was additional concern that the species could be extinct.

Given these concerns, we conducted a 1-week survey that included the historical occurrence locations, as well as multiple points in between, during a week of the September 2011 flight period (Salvato 2011, pp. 1-28). This limited survey failed to locate the species at either of the previously occupied locations of Bay St. Louis, Mississippi, or Anahuac NWR, Texas. However, only a few hours were spent searching each of the historical locations, thus neither the continued presence nor the extirpation of the species from these two sites could be confirmed, as habitat at both locations appeared

to be suitable to sustain the species (Salvato 2011, pp. 5–6, 11). As discussed above, the survey did confirm seven extant site locations of the Bay skipper in Chambers and Jefferson Counties, Texas, and in Cameron Parish, Louisiana (Gatrelle 2000, p. 4; Wauer 2006; Marks 2011a, pp. 92-94; Salvato 2011, pp. 1-14).

Although all of the site locations are known to have experienced one or more severe storm events by recent hurricanes (i.e., Hurricane Katrina 2005, Hurricane Rita 2005, Hurricane Gustav 2008, Hurricane Ike 2008), the Bay skipper continues to persist at the 7 newly confirmed locations. The Bay skipper is endemic to, and adapted to, estuarine marsh habitats. Such habitats in the northern Gulf of Mexico are frequently subject to tropical storms and hurricanes, and the area has experienced an increase in storm activity (Goldenberg *et al.* 2001, p. 474-475). Some researchers believe the increase in tropical storm and hurricane intensity, duration, and frequency can be attributed to warming of the Gulf of Mexico's water temperatures (Karl *et al.* 2009, pp. 5-6).

Researchers studying butterfly community response to hurricane and tropical storm events have documented local species declines and extirpations; however, this research has also found that those butterfly species most closely associated with the local vegetation survived and rapidly recovered from periodic storm impacts (Salvato and Salvato 2007, p. 160). Others recovered more gradually. For example, although the endangered Miami blue butterfly (*Cyclargus thomasi bethunebakeri*) declined on Bahia Honda following impacts from hurricanes Dennis, Katrina, and Wilma during 2005, the

population returned to pre-storm abundance within 2 years following the storms (Salvato and Salvato 2007, p. 160).

Estuarine plant species that are considered to be utilized by Bay skipper larvae include sawgrass, reeds, and bulrush (Salvato 2011, pp. 1-14). Adult Bay skippers have been observed feeding on native and exotic flowering plants such as goldenrod, Brazilian vervain, and frog fruit, as well as a variety of other annual and perennial nectar-producing plants adjacent to wetlands (Marks 2011a, pp. 92-94). All of these plants are common or abundant throughout the range of the Bay skipper. These plants are rapid colonizers under appropriate conditions, with seed dispersal occurring via water, wind, or animal transport. All of these plants will rapidly recover from severe storm impacts, as well as colonize new habitats as conditions become appropriate. The discovery of seven new site locations for the Bay skipper, all of which have been recently impacted by hurricane activity, indicates that this butterfly species, and the plants that it utilizes, are adapted to surviving severe storm events.

There are concerns that Bay skipper habitats could be negatively affected by sea level rise (WildEarth Guardians and Xerces Society for Invertebrate Conservation 2009, p. 9), and that impacts from storm events could be compounded by projected sea level rise (Karl *et al.* 2009, pp. 5-6). Since 2003, global mean sea level rise has been estimated at approximately 2.5 mm (0.10 in)/year (McMullen and Jabbour 2009, p. 26). Estimates of mean sea level trends (including subsidence) along the Gulf of Mexico within the range currently or potentially occupied by Bay skipper vary from 2.1 mm (0.0827 in)/year at Pensacola, Florida, to 9.6 mm (0.378 in)/year at Eugene Island, Louisiana, and

6.84 mm (0.2693 in)/year at Galveston, Texas (National Oceanographic and Atmospheric Administration 2012; see also Mitchum 2011 pp. 8-9). As noted above, during our status review, we obtained information on potential larval host and nectar plant species utilized by the Bay skipper, all of which are widely distributed, adapted to estuarine habitats, and capable of rapidly colonizing new habitats as conditions become appropriate.

Additionally, the flight capability of the Bay skipper and its life cycle (e.g., at least two broods per year) provide an ability for the species to accommodate local habitat changes.

During our survey, five of the seven newly recognized butterfly locations were found in Louisiana estuarine marshes. Coastal Louisiana contains the largest estuarine herbaceous marsh in the United States; however, it is also experiencing the highest rate of wetland loss in the country (Couvillion *et al.* 2011, p. 1). While it is likely that some Bay skipper habitats have been detrimentally affected by coastal marsh erosion in Louisiana, potential curtailment of range cannot be quantified due to the lack of information on historical range and specific habitat. Rates of wetland loss in Louisiana have been decreasing since 1978 (Couvillion *et al.* 2011, p. 12), and the estuarine herbaceous marsh habitat continues to be a dominant feature of the coastal landscape. In addition, multiple projects have been completed, are underway, or are under evaluation in Louisiana to further reduce losses and restore wetlands (see Other Conservation Efforts, below).

There is no available information supporting concerns that land management actions (e.g., livestock grazing, rice farming, land management involving conventional farm machinery, prescribed fires, herbicide use, water control) (WildEarth Guardians and

Xerxes Society 2009, pp. 10-11) are negatively affecting the Bay skipper. Estuarine marsh habitats where the Bay skipper have been identified are low-elevation herbaceous wetlands not suitable or utilized directly for grazing or farming, and are generally not subject to impacts by conventional farm machinery. Marshes may be periodically burned; however, fire is a natural component of the estuarine ecosystem, and managed fires are localized, seasonal, and beneficial to Bay skipper estuarine marsh habitats. Due to their low elevations and lack of agricultural potential, estuarine ecosystems are generally not subject to herbicide or pesticide use. As noted in the Background, above, there are multiple State or Federal refuges and protected areas that are managed for estuarine biodiversity. Herbicide and pesticide use in such areas is either restricted or closely managed. For example, on the Anahuac National Wildlife Refuge, herbicides are used only to combat exotic plant species (Cooper, pers. comm. 2010). While highway right-of-ways may be periodically subject to herbicide control measures, this would seasonally affect only a small proportion of the nectaring plants available to butterflies in any given area.

#### *Other Conservation Efforts*

Following the severe impacts of Hurricanes Katrina and Rita in 2005, the Coastal Protection and Restoration Authority (CPRA) was established by the Louisiana legislature to work with other State agencies, Federal agencies, private industries, and other nongovernmental entities. One of their primary goals is to conserve and restore Louisiana coastal wetlands and their role in hurricane protection. Since 2005, over 200

restoration and protection projects have been constructed, are in progress, or are proposed (CPRA 2012, pp. 22-25). Projects that protect, enhance, or restore estuarine herbaceous marshes include water and sediment diversions, marsh nourishment, marsh creation, shoreline protection, and hydrologic restoration (CPRA 2012, pp. 115-139).

The National Wildlife Refuge System Improvement Act of 1997 and the Fish and Wildlife Service Manual (601 FW 3, 602 FW 3) require maintaining biological integrity and diversity, comprehensive conservation planning for each refuge, and set standards to ensure that all uses of refuges are compatible with their purposes and the Refuge System's wildlife conservation mission. The comprehensive conservation plan (plan) addresses conservation of fish, wildlife, and plant resources and their related habitats, while providing opportunities for compatible wildlife-dependent recreation uses. An overriding consideration reflected in these plans is that fish and wildlife conservation has first priority in refuge management, and that public use be allowed and encouraged as long as it is compatible with, or does not detract from, the Refuge System mission and refuge purpose(s).

The Texas Chenier Plains National Wildlife Refuge Complex, which includes Anahuac and Texas Point National Wildlife Refuges, and the Southwest Louisiana National Wildlife Refuge Complex, which includes Cameron and Sabine National Wildlife Refuges, encompass most of the known, and much of the potential, habitat for Bay skipper in Texas and Louisiana (see Background, above). Both Refuge complexes have developed plans that prohibit, or closely control, land use management actions which may be harmful to maritime habitats and wildlife species, including the Bay skipper (U.S. Fish and Wildlife Service 2006, 2007, 2008). Currently, the Bay skipper is

not specifically named in the plans for each refuge; however, protection is provided to the species indirectly through management of potentially harmful land uses, and the plans can, and will be, amended to incorporate new information on locations and habitat management for Bay skipper (Hunter, pers. comm. 2012).

The Bay skipper is also found on the Rockefeller Wildlife Refuge, managed by the Louisiana Department of Wildlife and Fisheries, and Sea Rim State Park, managed by Texas Parks and Wildlife Department. Management activities on State Parks and Refuges are guided by State Wildlife Action Plans (Louisiana Department of Wildlife and Fisheries 2005, Texas Parks and Wildlife Department 2005), which provide a framework to recognize, manage, and conserve imperiled State wildlife. The Bay skipper is recognized as a species of management concern in the Texas Wildlife Action Plan (Texas Parks and Wildlife Department 2005, p. 59), and will be considered for inclusion in the upcoming revision of the Louisiana Wildlife Action Plan list (Bass, pers. comm. 2012). State Wildlife Action Plans also alert private and corporate landowners of the status, habitats, and general locations of wildlife species of concern, and help ensure consideration of the potential presence of the species and its habitat requirements during Federal and State permit review processes.

#### *Summary of Factor A*

In summary, we find that while Bay skippers are periodically and locally affected by hurricanes and tropical storms, the species and their habitats are adapted to such events. We find no evidence that the Bay skipper and the maritime plant communities upon which it depends will be unable to shift their distributions to accommodate current



rates of sea level rise. Their flight capability, and the production of two generations per year of the Bay skipper, should enable the species to rapidly colonize areas impacted by severe storm events, as well as adjust to maritime habitat shifts that may occur from sea level rise. We also find little evidence that land management actions are now having, or have in the past, had a wide negative effect on the species. Additionally, the magnitude of all of these potential threats to the species has also been reduced by the discovery and recognition of the Bay skipper's wider distribution, and ongoing efforts to protect and enhance estuarine marsh habitats. Therefore, our review of the best available scientific and commercial information does not provide evidence that the present or threatened destruction, modification, or curtailment of habitat and range represents an ongoing and significant threat to the Bay skipper now or in the future.

*B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes*

Rare butterflies and moths can be highly prized by collectors, and an international trade exists for some species for both live and decorative markets, as well as the specialist trade that supplies hobbyists, collectors, and researchers (e.g., Collins and Morris 1985, pp. 155–179; [http://www.theinsectcollector.com/acatalog/specimens\\_real.htm](http://www.theinsectcollector.com/acatalog/specimens_real.htm)).

However, the primary reason that little is known about the Bay skipper, as discussed above, is a lack of scientific or educational collecting in the area it inhabits. While we found some information regarding targeted scientific collecting activity to better document the distribution of the Bay skipper (Salvato 2011, pp. 1-14; Marks 2011a, pp. 92-94; Marks 2011b), our status review did not indicate that any commercial or

recreational trade in the species is occurring. Therefore, our review of the best available scientific and commercial information does not indicate that overutilization of the Bay skipper for commercial, recreational, scientific, or educational purposes is a threat to the species now or in the future.

### *C. Disease or Predation*

Studies suggest that various diseases and parasites (*e.g.*, baculovirus, *Ophryocystis* sp.) have the potential to negatively impact butterflies (Altizer and Oberhauser 1999, p. 76; Hesketh *et al.* 2010), and butterflies have many natural predators including frogs, lizards, birds, carnivorous insects, and spiders. However, the best available information does not indicate that disease or pathogens are specifically affecting Bay skippers, nor does it provide any evidence regarding the effect of natural predation on Bay skipper populations. The recently confirmed additional populations and a wider range for the Bay skipper reduce any potential vulnerability the species may have to extirpation by disease or predation in the future. Based on our analysis of the best available information, we have determined that neither disease nor predation are significant threats to the Bay skipper now or in the future.

### *D. The Inadequacy of Existing Regulatory Mechanisms*

The Bay skipper is classified as an S1 species in both Texas and Mississippi (NatureServe 2011). The S1 designation, based upon the number of occurrences within a State, is considered “critically imperiled – State level” under the NatureServe construct.

However, no formal or regulatory consideration is provided to the species or its habitat in Texas or Mississippi as a result of this classification. The Bay skipper has only recently been discovered in Louisiana (Marks 2011a, pp. 92-94; Salvato 2011, pp. 1-15), but receives no formal protections in that State. The Louisiana Natural Heritage Program has been informed of the discovery of the species in the State, and is currently working to update the NatureServe list to reflect that it has been found in the State (Bass pers. comm. 2012).

As noted under “Other Conservation Efforts,” above, the Louisiana CPRA has been established to work with other State and Federal agencies and nongovernmental entities to protect and restore Louisiana coastal wetlands, which include Bay skipper herbaceous marsh habitats. In addition, Bay skipper populations occurring on National Wildlife Refuges are protected by the National Wildlife Refuge System Improvement Act of 1997 and its implementing regulations, which require maintaining biological integrity and diversity on refuge lands. Bay skipper populations occurring in private estuarine wetland habitats are generally protected under section 404 of the Clean Water Act, which established a project review and permitting process to avoid or minimize wetland impacts, and which requires mitigation of unavoidable impacts.

Therefore, based on our analysis of the best available scientific and commercial information, there is currently no evidence that the inadequacy of existing regulatory mechanisms is a threat to the Bay skipper now or in the future.

### *E. Other Natural or Manmade Factors Affecting the Species' Continued Existence*

#### **Climate Change Effects**

Our analyses under the Act include consideration of ongoing and projected changes in climate. The terms “climate” and “climate change” are defined by the Intergovernmental Panel on Climate Change (IPCC). “Climate” refers to the mean and variability of different types of weather conditions over time, with 30 years being a typical period for such measurements, although shorter or longer periods also may be used (IPCC 2007, p. 78). The term “climate change” thus refers to a change in the mean or variability of one or more measures of climate (e.g., temperature or precipitation) that persists for an extended period, typically decades or longer, whether the change is due to natural variability, human activity, or both (IPCC 2007, p. 78). Various types of changes in climate can have direct or indirect effects on species. These effects may be positive, neutral, or negative and they may change over time, depending on the species and other relevant considerations, such as the effects of interactions of climate with other variables (e.g., habitat fragmentation) (IPCC 2007, pp. 8–14, 18–19). In our analyses, we use our expert judgment to weigh relevant information, including uncertainty, in our consideration of various aspects of climate change.

#### *Rising Sea Levels*

As noted under Factor A (above), annual rates of sea level rise along the Gulf of Mexico within the range currently or potentially occupied by Bay skipper vary from 2.1 mm (0.0827 in)/year at Pensacola, Florida, to 9.6 mm (0.378 in)/year at Eugene Island,

Louisiana, and 6.84 mm (0.2693 in)/year at Galveston, Texas (National Oceanographic and Atmospheric Administration 2012), and the estuarine plant communities that support the Bay skipper are composed of species that have the ability to rapidly colonize new areas under appropriate conditions and, therefore, can shift their distributions to accommodate currently predicted rates of sea level rise. Additionally, the flight capability of the Bay skipper and its ability to produce two generations per year enable the species to adjust to and exploit estuarine habitat shifts that may occur from gradual sea level rise. Also noted under Factor A (above), is the resilience of estuarine-adapted butterfly species to major storm events subjecting their habitats to inundation. This is supported by the discovery of new populations of Bay skipper (Salvato 2011, pp. 1-15) in areas that have recently been subjected to one or more severe tropical storms (see Background, above). Rising temperatures associated with climate change and rising sea levels may also present new host and nectaring plant opportunities for Bay skipper (e.g., Pateman *et al.* 2012, pp. 1028-1030). Our review of the best available information does not indicate that sea level rise is a significant threat to the species.

#### *Increased Intensity and Frequency of Storms*

Climate change can cause more frequent and severe storms, including hurricanes. This can have a number of detrimental effects on butterfly populations, including habitat loss, destruction of preferred food and host plants, flooding, and extirpation of affected populations. There is concern that hurricanes may have extirpated Bay skipper populations from Bay St. Louis, Mississippi, and Anahuac NWR, Texas, due to habitat damage and inundation. However, seven new populations of Bay skipper were

discovered, all of them in locations that have experienced one or more recent hurricane storm events. This indicates that while severe storms have the potential to negatively affect Bay skipper populations, the species is capable of recovering from storm damage, even when storms occur closely spaced in time, such as Hurricanes Gustav and Ike in 2008. Salvato and Salvato (2007) noted that butterflies that were quick to recover after severe storms were those species associated with the local vegetation. The Bay skipper is endemic to estuarine marsh habitats and associated with vegetation that is quick to colonize new areas under appropriate conditions, so the Bay skipper is likely capable of recovering quickly from severe storms. The species also has the advantage of producing two generations per year, allowing for faster recolonization of damaged areas. Our review of the best available scientific and commercial information does not indicate that increased frequency and intensity of storms is a significant threat to the species.

### Biological Vulnerability

Species with small population sizes and restricted ranges are more vulnerable to random natural or human-induced events (e.g., storms, droughts, spills, etc.). There were concerns that the Bay skipper may have been extirpated after the habitat for the Bay St. Louis, Mississippi, population of Bay skipper was severely damaged by Hurricane Katrina in 2005, and the habitat for the Anahuac NWR, Texas, population was inundated by Hurricane Ike in 2008 (WildEarth Guardians and Xerces Society for Invertebrate Conservation 2009, p. 9). However, the discovery of additional populations, inhabiting locations which were not previously known to be occupied, with limited survey effort at

the end of the September 2011 flight season, indicates that the range and total population size of the Bay skipper is poorly known and may neither be restricted, nor small (see Background). Additionally, apart from localized stochastic events, our review of the best available scientific and commercial information did not provide evidence of any specific threats to the known populations (see Factors A, B, C, and D, above), nor did it indicate that the Bay skipper is biologically vulnerable due to restricted range and small population size.

#### Pesticide Use

Butterflies and their larvae are vulnerable to pesticides; however, the estuarine marsh habitats where the species occurs are not subject to activities requiring pesticide use (see Factor A, above), and there is no available evidence to indicate that the Bay skipper is being impacted or is likely to be impacted by pesticide or other chemical use.

#### *Summary of Factor E*

The discovery of additional populations and a wider range for the Bay skipper reduces the species' potential vulnerability to stochastic events. In summary, our review of the best available scientific and commercial information found no evidence that other natural or manmade factors, such as rising sea level due to climate change, biological vulnerability from restricted range or small population size, or pesticide use are threats to the Bay skipper either now or in the future.

#### **Finding**

As required by the Act, in assessing whether the Bay skipper is an endangered or threatened species throughout all of its range, we considered the five factors. We examined the best scientific and commercial information available regarding the past, present, and future threats faced by the Bay skipper. We reviewed the petition, information available in our files, other available published and unpublished information, and we consulted with recognized butterfly experts and other Federal and State agencies. We also conducted a brief survey for the species (Salvato 2011, pp. 1-28).

Information acquired during our review of the Bay skipper indicated that there has been an increase in the known range of the species, and an expansion of the number of known site occurrences for the species. Our limited survey of potential habitats between the Florida panhandle and Galveston, Texas, found abundant and apparently suitable habitat, and confirmed seven new site records in 7 days (Salvato 2011, pp. 1-28). In addition, there is a large extent of coastal estuarine habitats along Texas, Louisiana, and Mississippi that have not been surveyed for the presence of the Bay skipper. Existing programs have been developed and implemented to conserve and restore the extensive estuarine wetland network occupied by the Bay skipper.

Our review of the best available scientific and commercial information revealed that the Bay skipper is poorly known and additional research is needed to define range and abundance. However, during our status review, we did not document any significant threats to the species or its habitat throughout its currently known range, or within a significant portion of that range; instead, with minimal effort we increased the number of known populations (from 2 to 7), and extended the range of the species into the largest



estuarine herbaceous marsh in the United States. We found no evidence that the species has experienced curtailment of range or habitat or is affected by disease or predation, commercial or recreational harvest, the inadequacy of existing regulations, or any other natural or manmade factor. We documented only localized impacts from severe tropical storms and hurricanes; however, the species' potential vulnerability to local extirpations that might result from severe storms or any other stochastic event is offset by the discovery of additional populations and a wider range for the Bay skipper.

Based on our review of the best available scientific and commercial information pertaining to the five factors, we find that the threats are not of sufficient severity or intensity to indicate that the Bay skipper is in danger of extinction (endangered), or likely to become endangered within the foreseeable future (threatened), throughout all or a significant portion of its range. Therefore, we find that listing the Bay skipper as an endangered or threatened species is not warranted throughout all of its range at this time.

#### *Significant Portion of the Range*

Having determined that the Bay skipper does not meet the definition of an endangered or threatened species throughout its entire range, we must next consider whether there are any significant portions of the range where the Bay skipper is in danger of extinction or is likely to become endangered in the foreseeable future. A portion of a species' range is significant if it is part of the current range of the species and it contributes substantially to the representation, resiliency, or redundancy of the species. The contribution must be at a level such that its loss would result in a decrease in the ability to conserve the species.

In determining whether a species is an endangered or threatened species in a significant portion of its range, we first identify any portions of the range of the species that warrant further consideration. The range of a species can theoretically be divided into portions an infinite number of ways. However, there is no purpose to analyzing portions of the range that are not reasonably likely to be both (1) significant and (2) endangered or threatened. To identify only those portions that warrant further consideration, we determine whether there is substantial information indicating that: (1) The portions may be significant, and (2) the species may be in danger of extinction there or likely to become so within the foreseeable future. In practice, a key part of this analysis is whether the threats are geographically concentrated in some way. If the threats to the species are essentially uniform throughout its range, no portion is likely to warrant further consideration. Moreover, if any concentration of threats applies only to portions of the species' range that are not significant, such portions will not warrant further consideration.

If we identify portions that warrant further consideration, we then determine whether the species is endangered or threatened in these portions of its range. Depending on the biology of the species, its range, and the threats it faces, the Service may address either the significance question or the status question first. Thus, if the Service considers significance first and determines that a portion of the range is not significant, the Service need not determine whether the species is an endangered or threatened species. Likewise, if the Service considers status first and determines that the species is not an endangered or threatened species in a portion of its range, the Service need not determine

if that portion is significant. However, if the Service determines that both a portion of the range of a species is significant and the species is an endangered or threatened species, the Service will specify that portion of the range as an endangered or threatened species under section 4(c)(1) of the Act.

The Bay skipper is highly restricted to estuarine habitats, and threats to estuarine habitats are limited and localized throughout its range. This species' small range suggests that stressors are likely to affect it in a uniform manner throughout its range. However, we found the stressors are not of sufficient intensity or severity or geographically concentrated to warrant evaluating whether a portion of the range is significant under the Act. Accordingly, our assessment applies to the Bay skipper throughout its entire range.

We do not find that the Bay skipper is in danger of extinction now, nor is it likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Therefore, listing the Bay skipper as an endangered or threatened species under the Act is not warranted at this time.

We request that you submit any new information concerning the status of, or threats to, the Bay skipper to the Mississippi Ecological Service's Fish and Wildlife Office (see **ADDRESSES** section) whenever it becomes available. New information will help us monitor the Bay skipper and encourage its conservation. If an emergency situation develops for the Bay skipper or any other species, we will act to provide

immediate protection.

### **References Cited**

A complete list of references cited is available on the Internet at <http://www.regulations.gov> at Docket No. FWS-R4-ES-2011-0012 and upon request from the Mississippi Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

### **Author**

The primary author of this notice is the staff of the Mississippi Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

### **Authority**

The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: August 9, 2012

Signed: Rowan W. Gould

Acting Director, U.S. Fish and Wildlife Service

~~[Endangered and Threatened Wildlife and Plants; 12-Month Finding on a  
Petition to List the Bay Skipper as Endangered or Threatened]~~

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