

CANDIDATE ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: Polites mardon

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COMMON NAME: Mardon skipper

LEAD REGION: Region 1

INFORMATION CURRENT AS OF: April 2004

STATUS/ACTION (Check all that apply):

       New candidate

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Continuing candidate

       Non-petitioned

Petitioned - Date petition received: 12/11/02

       90-day positive - FR date:       

       12-month warranted but precluded - FR date:       

       Is the petition requesting a reclassification of a listed species?

Former LP:       

New LP:       

Latest Date species became a Candidate: 10/25/99

       Candidate removal: Former LP:        (Check only one reason)

       A - Taxon more abundant or widespread than previously believed or not subject to a degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

       F - Range is no longer a U.S. territory.

       M - Taxon mistakenly included in past notice of review.

       N - Taxon may not meet the Act's definition of a species. @

X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Insect; HesperIIDae (Skippers)

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Washington, Oregon, California

CURRENT STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Washington, Oregon, California

LEAD REGION CONTACT (Name, phone number): Scott McCarthy (503/231-6131)

LEAD FIELD OFFICE CONTACT (Office, name, phone number): Western Washington Fish and Wildlife Office, Ted Thomas (360/753-4327)

BIOLOGICAL INFORMATION (Describe habitat, historic vs. current range, historic vs. current population estimates (# populations, #individuals/population), etc.):

The Mardon skipper (*Polites mardon*) is a small, nonmigratory butterfly species that was first described by W. H. Edwards (1881) (Black et al. 2002). This tawny-orange butterfly has a stout, hairy body. The upper surfaces of the wings are orange with broad dark borders. The lower surfaces are light tan orange, with a distinctive pattern of light yellow to white rectangular spots (Potter et al. 1999).

The Mardon skipper spends its entire life cycle in one location; it does not migrate. Dispersal distance is unknown, but is believed to be limited. After mating, females deposit their eggs into tufts of bunchgrass (*Festuca* spp.) (A. Potter, Washington Department of Fish and Wildlife (WDFW), pers. comm. 2003). Eggs hatch after 6 or 7 days (Newcomer 1966; Black et al. 2002). Larvae feed on fescue grass for approximately 3 months (Dornfeld 1980; Black et al. 2002). Pupae hibernate through winter, probably in a loose cocoon in the grass (Newcomer 1966).

Adults feed on nectar from a variety of herbaceous plants (Black et al. 2002). At one south Puget Sound prairie site, early blue violet (*Viola adunca*) and common vetch (*Vicia sativa*) were strongly preferred as nectar sources, and Scots broom (*Cytisus scoparius*) was strongly avoided (Hays et al. 2000; Black et al. 2002). Nectaring was also observed on common camas (*Camassia quamash*), prairie lupine (*Lupinus lepidus*), fine-leaved desert parsley (*Lomatium utriculatum*), western buttercup (*Ranunculus occidentalis*), and Idaho blue-eyed-grass (*Sisyrinchium idahoense*).

In the southern Cascades, adults have frequently been observed nectaring on vetch (*Vicia* spp.), penstemon (*Penstemon* spp.), and sego lily (*Calochortus* spp.) (Potter and Fleckenstein 2002). Wallflower (*Erysimum capitatum*), hawkweed (*Hieracium* sp.), hawksbeard (*Crepis* sp.), geranium (*Geranium* sp.), fleabane (*Erigeron* sp.) and yarrow (*Achillea millefolium*) are also reported nectar sources from this region (Newcomer 1966; Potter and Fleckenstein 2001). Mardon skipper larvae feed on species of bunchgrass, including Roemer's fescue (*Festuca idahoensis* var. *roemeri*), Idaho fescue (*Festuca idahoensis*) and red fescue (*Festuca rubra*) (Pyle 1989; A. Potter, pers. comm. 2003).

In 2001 surveys, the most common flowers used for nectar by Mardon skippers in habitats near Mt. Adams were *Vicia* spp. and *Fragaria* spp. (strawberry). Nectar species observations are not available for California and Oregon (Harke 2001).

The Mardon skipper is a rare, northwestern butterfly with a remarkably disjunct range. This species is currently known from four widely separated locations: the southern Puget Trough region, the southern Washington Cascades, the Siskiyou Mountains in southern Oregon, and coastal northern California (Black et al. 2002).

On south Puget Sound prairies, Mardon skippers are found in open, glacial outwash grasslands with abundant *Festuca idahoensis* var. *roemeri* interspersed with *Viola adunca* (Potter et al. 1999; Black et al. 2002). In the southern Cascades, the Mardon skipper is found in open grasslands within ponderosa pine (*Pinus ponderosa*) savanna/woodland or in the grand fir (*Abies grandis*) zone at elevations ranging from 549 to 1,677 meters (m) (1,800 to 5,500 feet (ft)) (Harke 2001; Potter and Fleckenstein 2002). To date, all occupied sites in the southern Washington Cascades have been found within 56 kilometers (km) (35 miles (mi)) of Mt. Adams.

Sites with grassland vegetation, including meadows, grassy forest openings, roadside meadows, and grass-dominated tree plantations, support Mardon skipper populations. Southern Cascade sites vary in size from small 0.25 hectare (ha) (0.5 acre (ac)) or less meadows to large grassland complexes. Site conditions range from dry, open ridgetops to grasslands associated with wetlands, springs, or riparian habitat.

Populations in southern Oregon occupy small (less than 0.25 ha (0.5 ac)) high-elevation (1,372–1,555 m (4,500–5,100 ft)) grassy meadows within mixed conifer forests.

The California population is located on a serpentine bald dominated by *Festuca* spp. In each of these areas, frequent low-intensity fires have historically played an important role in maintaining the grassland plant communities.

In Washington, the historic range and abundance of Mardon skippers is not known, and there are no known estimates of abundance prior to 1980 (Black *et al.* 2002). Mardon skippers are apparently extirpated from five historic sites (four in the Puget Prairie and one in the southern Cascades) (Potter *et al.* 1999). Historically, Mardon skippers were collected from Thurston, Klickitat, and Yakima Counties. Currently, Mardon skippers occupy sites in Thurston, Pierce, Klickitat, Skamania, and Yakima Counties (Potter *et al.* 1999).

South Puget Sound Prairie. In 1998, 17 individuals were counted on a 100-ha (247-ac site) in Pierce County. In Thurston County, there were an estimated 5–10 adults at one 2 to 4 ha (5 to 10 ac) site and an estimated 50–80 adults at a second 8 to 12 ha (20 to 30 ac) site. No Mardon skippers were found at four historic sites surveyed in 1998 (Potter *et al.* 1999).

In May and June 2001, two sites were surveyed in Thurston County; no Mardon skippers were detected at one site (40 ha (100 ac)) and 144 Mardon skippers (highest of 3 counts) were detected at the second site (11 ha (26 ac)). In 2002 surveys, Mardon skippers were found at all three known sites in Thurston County (A. Potter, pers. comm. 2003).

Southern Washington Cascades. In 1998, Mardon skippers were found at six of eight sites surveyed. More than 100 adults were estimated to occur at one site, but estimates of adults for the other 5 sites ranged from 5–50 (Potter *et al.* 1999). In 2001, surveys for Mardon skippers were increased and 29 sites surveyed, Mardon skippers were documented at 13. The number of Mardon skippers observed at occupied sites ranged from 1 or 2 individuals to more than 180 individuals. All of these sites were located near Mt. Adams in the grand fir zone. One new site, on the southern slopes of Mt. Adams at 1,707 m (5,600 ft), represents the highest elevation record for the species (Harke 2001).

Prior to 2002, all known sites in the southern Washington Cascades were located east of the Cascade crest. Surveys in 2002 located 10 new sites near Mt. Adams, including 6 sites west of the Cascade crest in the upper Cispus River drainage. Surveys in 2003 conducted by the WDFW and U.S. Forest Service staff were conducted on the Gifford Pinchot National Forest where two new locations of skippers were discovered within the Little White Salmon watershed. A new Mardon skipper site was also located by FWS personnel, northeast of Mt. Adams near Mt. Adams Lake (V. Harke, in litt., 2004). Currently, there are 43 known sites in the southern Cascades of Washington.

Southern Oregon, Siskiyou Mountains. There are three or four Mardon skipper sites within a 16-km (10-mi) radius in southeastern Jackson County. At one site, an estimated 200 individuals were present in 1991, but that count has not been duplicated in subsequent years. Other sites, most recently visited in 1991, hosted a few individuals (Potter *et al.* 1999; Paul Runquist, pers. comm. 1998).

Northern Oregon, Columbia River Gorge. During the 2003 field season, surveys were conducted on the Mount Hood National Forest on the Oregon side of the Columbia Gorge National Scenic Area. No mardon skippers were located during these surveys. There are no documented occurrences of Mardon skippers in northern Oregon, but the area appears to have suitable grassland habitat for the species (V. Harke, in litt., 2004).

Northern California. Mardon skippers were present in 1997, but there were no surveys in 1998. In good years, dozens of individuals are found in the 0.4 to 0.8 ha (1 to 2 ac) core area and along a ridge for 3B5 km (2B3 mi) (Potter *et al.* 1999; S. Mattoon and K. Hanson, pers. comm. 1998). Surveys were conducted in Del Norte County, northern California in 2003, four new Mardon skipper sites were discovered in the vicinity of the historic Del Norte site (V. Harke, in litt., 2004).

THREATS (Describe threats in terms of the five factors in section 4 of the ESA providing specific, substantive information. If this is a removal of a species from candidate status or a change in listing priority, explain reasons for change):

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

Because the Mardon skipper is nonmigratory, and thus relatively sedentary, maintaining occupied habitat quality is essential (Erhlich 1992). Pyle (1989) identified the threats to the Mardon skipper as any factor that degrades its obligate grassland habitats, including development, overgrazing, the use of herbicides and pesticides (*Bacillus thuringiensis* var. *kurstaki* (Btk)), the encroachment of invasive nonnative and native vegetation, and succession from grassland to forest.

Prairies, which once covered hundreds of thousands of acres of the southern Puget Sound region prior to settlement, have been lost to development, conversion to other uses (agriculture and gravel mining), fire suppression, and invasion by native and nonnative plant species. Today, less than 3 percent of the original prairie landscape remains, and much of this has competing human uses (Crawford and Hall 1997).

Invasion and dominance of nonnative plant species into native grasslands is common and has occurred rapidly at several current and historic Mardon skipper sites. Introduced plants threaten the Mardon skipper by directly competing with larval food plants. Many invasive woody shrubs, forbs, and grasses also prevent or obscure access by adults to nectar plants. Invasive, nonnative, sod-forming grasses (such as *Holcus* spp. and *Arrhenatherum elatius*), and weedy forbs, including *Hypochaeris* spp., threaten native bunchgrasses (*Festuca* spp.) that Mardon skippers depend on for egg deposition, larval food, and hibernaculum structures. The short character of Festuca dominated grasslands allows access for the adult butterfly to its similarly short, native nectar sources (Black *et al.* 2002). All Mardon skipper sites have not been

evaluated for the presence of aggressive, nonnative plants; however, the problem is increasingly common (Potter et al. 1999).

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The invasive shrub, Scotch broom, poses a threat to grasslands on south Puget Sound prairies because of its ability to form dense stands that exclude native grassland species (Black et al. 2002). Parker et al. (1997) found a nearly exclusive relationship between Scotch broom and *Festuca idahoensis* var. *roemerii*. Also, due to its highly flammable nature, areas of Scotch broom increase the vulnerability of nearby native plants and butterflies, to high-intensity fire. While intensive management appears to be controlling Scotch broom at two south Puget Sound prairies, this management must be continued for the foreseeable future. Unfortunately, control methods for Scotch broom, which may include hand pulling, herbicide spraying, tractor mowing, or burning, can negatively impact Mardon skippers. Some Mardon skipper eggs, larvae, or pupae, which are immobile and on ground-level vegetation, may be harmed by trampling or heat (Ehrhardt 1985; Dana 1991).

Small, roadside meadows are vulnerable to native species removal and nonnative grass introduction when reseeding occurs after road work. Currently, this threat applies to most southern Oregon and several southern Washington Cascade sites. At least one historic locale in the southern Washington Cascades and a large portion of potential habitat has been destroyed by this practice (Potter et al. 1999).

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Human structures, including roads and trails, logging landings, helicopter pads, buildings, towers, livestock corrals, trail destinations, and campgrounds are often built in forest openings. Construction in these areas results in direct habitat loss and degradation of remaining habitat. In Washington, roads, trails, and buildings have destroyed habitat at one south Puget Sound prairie. Helicopter landing pads have removed habitat at two southern Washington Cascade locales. A lookout tower, roads, trails, and buildings are also present at one of these sites. Buildings at two additional southern Cascade locales have significantly reduced the size of available habitat. Roads, trails, and camping areas have destroyed habitat at another. Oregon Siskiyou sites are located adjacent to roads in a highly managed landscape. It is likely, therefore, that these structures and associated human activities threaten southern Oregon populations as well (Potter et al. 1999)

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Small, isolated populations of sedentary insects, such as the Mardon skipper, are vulnerable to fire (Black et al., 2002). Their grassland habitat persisted partly because of repeated, patchy, low-intensity fires. However, large-scale, high-intensity fires would be detrimental through direct mortality of individuals and damage to habitat because of the continuous, rather than patchy distribution of the burn.

Recreational activities, including walking, horseback and off-road vehicle use, probably kill some Mardon skippers directly (Black et al. 2002). These activities also degrade habitat by damaging native plants and opening ground cover for invasion by weeds. Two occupied south Puget Sound prairies, three southern Washington Cascades sites, and the California population are currently threatened by recreational activities (Potter et al. 1999).

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Livestock grazing impacts populations through direct trampling of eggs, larvae, pupae, and adults (Black et al. 2002). Larval and adult food sources are destroyed by consumption by

livestock and trampling. The native fescue bunch grasses, essential to Mardon skippers, regenerate by seeds that are likely consumed during grazing. Soil disturbance allows invasion by weeds. Grazing occurs on occupied habitat in the southern Cascades, with a significant negative impact on one site, and in Oregon Siskiyou; however, grazing no longer occurs on occupied sites in the southern Puget region (Potter et al. 1999).

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Insecticide application poses a threat to populations in the southern Puget Sound region and the Washington Cascades. Bacillus thurengensis var. kurstaki (Bt or Btk) is a lepidopteran-specific insecticide that is applied in large-scale, aerial applications to control Asian gypsy moth (Lymantria dispar) in the Puget Sound region and in the Washington Cascades to control spruce budworm (Choristoneura occidentalis). This insecticide has been proposed for use in the Washington and southern Oregon Cascades to control the Douglas-fir tussock moth (Orygia pseudotsugata) (Black et al. 2002). Although grasslands are not targeted for application, small meadow or savanna/woodlands may receive aerial applications due to difficult visibility of small sites and drift of the insecticide. Lepidopteran species, such as the Mardon skipper, that are single brooded, spring-active species with caterpillars actively feeding during the application period of Bacillus thurengensis for the target insect species are especially vulnerable (Wagner and Miller 1995; Black et al. 2002). Unless applied with care beyond that required by standard procedures and label directions, Bacillus thurengensis is lethal to the Mardon skipper. Most of the southern Washington Cascade Mardon skipper sites have either recently been treated or are proposed for Bacillus thurengensis applications by Federal, State, tribal and private land managers (Wagner and Miller 1995; Potter et al. 1999).

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Herbicide use could damage a population by harming larval or adult food sources. One south Puget Sound Prairie and one Oregon population are especially vulnerable because herbicide applications are used to manage vegetation on electrical utility line right-of-ways crossing these sites.

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

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Insect collecting is a valuable component of research, including systematic work, and is often necessary for documenting the existence of populations (Black et al. 2002). It is, however, a potential threat to insect populations. Rare butterflies, such as the Mardon skipper, are desirable to collectors. Populations that are small and easily accessible, which is true of most Mardon skipper populations, are especially threatened (Potter et al. 1999; Black et al. 2002).

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Most Mardon skipper populations are small enough in numbers and area that activities of researchers may pose a threat. Trampling can cause direct mortality, and damage to the habitat may lead to additional mortality.

#### C. Disease or predation.

Disease and predation may be a threat to populations that are suppressed by other factors, but no examples are known for this species.

#### D. The inadequacy of existing regulatory mechanisms.

Although there is no Washington State Endangered Species Act, the Washington Fish and

Wildlife Commission has the authority to list species and provide protection from direct take. However, species listing in Washington has no associated habitat protection regulation. The Mardon skipper is currently a candidate for listing in Washington. However, candidate status within Washington State has no protective measures associated with it. It is not listed as a protected species in Oregon or California (Black et al. 2002).

E. Other natural or manmade factors affecting its continued existence.

Most insect populations experience large fluctuations in size. Weather, predation, disease and even the timing of surveys may cause annual changes in butterfly numbers of an order of magnitude or more. Small populations are acutely vulnerable to extirpation from any one of the threats presented above. Sites from which Mardon skippers have been extirpated are unlikely to be recolonized because surviving populations are widely separated and very small, and Mardon skippers are relatively sedentary. Almost all remaining Mardon skipper populations are small and therefore vulnerable to this process (Potter et al. 1999).

FOR RECYCLED PETITIONS:

- a. Is listing still warranted? Yes
- b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? Yes
- c. Is a proposal to list the species as threatened or endangered in preparation? No
- d. If the answer to c. above is no, provide an explanation of why the action is still precluded. In December 2002, the Service received a petition to list this species under the Endangered Species Act. We considered the petition in this assessment and incorporated information from the petition where appropriate. Since publication of the 2002 CNOR, the publication of a proposed rule to list this subspecies has been precluded by other higher priority listing actions, and based on work scheduled, we expect that will remain the case for the remainder of fiscal Year 2004. Nearly the entire national listing budget has been consumed by work on various listing actions taken to comply with court orders and court-approved settlement agreements, emergency listing, and essential litigation-related, administrative, and program management functions. We will continue to monitor the status of Mardon skippers as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures.

LAND OWNERSHIP (Estimate proportion Federal/state/local government/private, identify non-private owners): Most of the sites occur on Federal lands, but State, Tribal, and private lands also have occurrences. In the following states, land ownership includes:

Washington: Department of Defense, Washington Department of Fish and Wildlife, Yakama Indian Reservation, private, USDA Forest Service.

Oregon: USDA Forest Service, Bureau of Land Management, and private ownership.

California: USDA Forest Service.

PRELISTING (Describe status of conservation agreements or other conservation activities):

Within the south Puget Sound prairie ecosystem, the removal of woody shrubs using herbicides, mechanical methods and prescribed burning (Department of Defense lands) has been accomplished to improve habitat for the species. A number of WDFW wildlife areas have been improved using mowing and herbicide spraying methods to remove nonnative and woody shrubs.

REFERENCES (Identify primary sources of information (e.g., status reports, petitions, journal publications, unpublished data from species experts) using formal citation format):

- Black, S.H., K. Hitt, and M. Vaughn. 2002. Petition to list the Mardon skipper butterfly (Polites mardon) as an endangered species under the U.S. Endangered Species Act. Report submitted to The Xerces Society, Gifford Pinchot Task Force, The Northwest Environmental Defense Center, Center for Biological Diversity, Oregon Natural Resources Council, Friends of the San Juans, and Northwest Ecosystem Alliance. 25 pp.
- Crawford, R.C. and H. Hall. 1997. Changes in the south Puget prairie landscape. Pages 11B16 in P. V. Dunn, and K. Ewing, eds. 1997. Ecology and Conservation of the South Puget Sound Prairie Landscape. The Nature Conservancy, Seattle, WA. 289pp.
- Dana, R.P. 1991. Conservation management of the prairie skippers Hesperia dacotae and Hesperia ottoe: basic biology and threat of mortality during prescribed burns. U. of Minnesota. Minnesota Agricultural Experiment Station Bulletin 594B1991(ADBSBB 5511BS). 62 pp.
- Edwards, W.H. 1881. Description of new species of butterflies. Papilio 1(4):43B48.
- Ehrhardt, A. 1995. Diurnal Lepidoptera: sensitive indicators of cultivated and abandoned grassland. Journal of Applied Ecology 22:849B861.
- Harke, V. 2001. U.S. Fish and Wildlife Service surveys for Mardon skipper in southwestern Washington summary year 2001. Unpublished report submitted to Washington Department of Fish and Wildlife, Olympia, WA. 19 pp.
- Hays, D.W., A. Potter, C. Thompson, and P. Dunn. 2000. Critical habitat components for four rare south Puget Sound butterflies. Washington Department of Fish and Wildlife, Olympia, and The Nature Conservancy of Washington, Seattle. 35 pp.
- Newcomer, E.J. 1966. Life histories of three western species of Polites. J. Res. Lepid. 5:243B247.
- Parker, I., W. Harpole, and D. Dionne. 1997. Plant community diversity and invasion of the exotic shrub Cytisus scoparius: testing hypotheses of invasibility and impact. Pages 149-161 in P. V. Dunn, and K. Ewing, eds.. 1997. Ecology and Conservation of the South Puget Sound Prairie Landscape. The Nature Conservancy, Seattle, WA. 289pp.

Potter, A.E., and D. W. Hays. 1998. Fieldwork conducted by Washington Department of Fish and Wildlife for the critical habitat components of candidate south Puget Sound prairie butterflies - Interim 1998 Field Season. Washington Department of Fish and Wildlife, Olympia, WA.

Potter, A. and J. Fleckenstein. 2002. Mardon skipper range and distribution in Washington in relation to state and federal highways with a habitat description and survey method guidelines. Final report to Washington Department of Transportation. Washington Department of Fish and Wildlife, Olympia, WA. 18 pp.

Potter, A., J. Fleckenstein, S. Richardson, and D. Hayes. 1999. Washington state status report for the Mardon skipper. Washington Department of Fish and Wildlife, Olympia, WA. 39 pp.

Pyle, R.M. 1989. Washington butterfly conservation status report and plan. Washington Department of Wildlife, Nongame Program, Olympia, WA. 217 pp.

LISTING PRIORITY (place \* after number)

THREAT
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Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5 *
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

**Rationale for listing priority number:**

*Magnitude:* The magnitude of the threat is high because of the small size of all populations and their disjunct distribution. Loss of any population could lead to extirpation of the species at any of these disjunct locations.

*Imminence:* Any of the potential threats may occur at any time. Threats to Mardon skippers are non-imminent because the number of known locations for the species has increased from less than 10 in 1998 to greater than 40 in 2003. Its disjunct distribution has increased from three locales found in Washington and Oregon to include new populations in northern California, therefore broadening its spatial distribution.

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes to the candidate list, including listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all additions of species to the candidate list, removal of candidates, and listing priority changes.

Approve: Carolyn Bohan April 15,  
2004 Acting Regional Director, Fish and Wildlife Service Date

Concur: Steve Williams April 19, 2004  
Director, Fish and Wildlife Service Date

Do not concur: \_\_\_\_\_  
Director, Fish and Wildlife Service Date

Director's Remarks:  
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Date of annual review: April 2004

Conducted by: T. Thomas

Comments:  
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