U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Ipomopsis polyantha*

COMMON NAME: Pagosa skyrocket

LEAD REGION: Region 6

INFORMATION CURRENT AS OF: March 12, 2007

STATUS/ACTION
___ Species assessment - determined species did not meet the definition of endangered or threatened under the Act and, therefore, was not elevated to Candidate status
___New candidate
_X_ Continuing candidate
_X_ Non-petitioned
___ Petitioned - Date petition received:
__ 90-day positive - FR date:
__ 12-month warranted but precluded - FR date:
__ Did the petition request a reclassification of a listed species?
FOR PETITIONED CANDIDATE SPECIES:
a. Is listing warranted (if yes, see summary of threats below)
b. To date, has publication of a proposal to list been precluded by other higher priority listing actions?
c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded.
___ Listing priority change
Former LP: ___
New LP: ___
Date when the species first became a Candidate (as currently defined): 5/11/2005
___ Candidate removal: Former LP: ___
___ A – Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.
___U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.
___ F – Range is no longer a U.S. territory.
___ I – Insufficient information exists on biological vulnerability and threats to support listing.
___ M – Taxon mistakenly included in past notice of review.
___ N – Taxon does not meet the Act's definition of "species."
___ X – Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Flowering Plant, Polemoniaceae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Colorado

CURRENT STATES/ COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Archuleta County, Colorado

LAND OWNERSHIP: Approximately 53 percent of occupied habitat is on Colorado Department of Transportation highway right of ways, 44 percent is on private lands, 1 percent is on Town of Pagosa park land, and 2 percent on Bureau of Land Management (BLM) land ,which will become private when a planned land exchange is completed. The BLM reports that the status of the proposed land exchange is still pending (Brinton, 2007, p. 1)

LEAD REGION CONTACT: Pat Mehlhop, (303) 236-4215, pat_mehlhop@fws.gov

LEAD FIELD OFFICE CONTACT: Ellen Mayo, (970) 243-2778, ellen_mayo@fws.gov

BIOLOGICAL INFORMATION:

Species Description

Ipomopsis polyantha is an "Herbaceous perennial or possibly biennial (monocarpic) up to 30 to 60 cm (12 to 24 inches) tall, branched from near the base, with grayish deeply divided leaves with linear leaflets scattered up the stem. The inflorescences occur along the stem in the axils of the leaves as well as at the top of the stem. The white tubular flowers may be flecked with purple dots and have short tubes with flaring lobes" (Anderson 1988, p. 3). These dots are occasionally so dense as to give the flower a pinkish or purplish hue. The corolla is 10 millimeters (0.4 inches) long with a short throat of 4.5-6.5 mm (0.17-0.25 in) and flaring lobes. The stamens are noticeably exserted (Anderson 2004, p. 13).

Taxonomy

I. polyantha was originally described by Rydberg (1904) as *Gilia polyantha.* Grant (1956) moved the species into the genus *Ipomopsis.* Two other taxa have been included within *I. polyantha* as synonyms or varieties: *Gilia polyantha* var. *brachysiphon* and *G. polyantha* var. *whitingii* (Kearney and Peebles 1943). Recent taxonomic research suggests that neither *brachysiphon* nor *whitingii* should be treated as infraspecific taxa under *I. polyantha* (Anderson 2004, p. 11). Porter et al. (2003) included *whitingii* but not *brachysiphon* in their phylogenetic analysis of *Ipomopsis,* and it does not appear to be closely related to *I. polyantha.* Thus, the most up-to-date sources available indicate that *I. polyantha* is a distinct species. It is treated as such in Kartesz (1999) and in the PLANTS database (U.S. Department of Agriculture, National Resources Conservation Service 2003).

Habitat

I. polyantha is limited specifically to Pagosa-Winifred soils derived from Mancos Shale. The pH is nearly neutral to slightly alkaline (6.6-8.4). The elevation range is 6,800-7,300 feet. It occurs in discontinuous colonies as a pioneer on open shale or as a climax species along the edge of ponderosa pine/juniper/oak forested areas. Anderson (1988, p. 7) reported finding the highest

densities under ponderosa pine forests with montane grassland understory. Now it is found mostly on sites that are infrequently disturbed, such as road right of ways that are fenced from grazing (as opposed to open range), seldom grazed pastures, and vacant lots (Anderson 2004, p. 20).

Historical and Current Range/Distribution

Between its discovery in 1899 and its designation as a category 2 candidate in 1985, *I. polyantha* was only found in the vicinity of Pagosa Springs. In 1985, an additional occurrence was found about 10 miles west of the town, and in 2002 another occurrence was documented 1.2 miles east of Pagosa Springs (Anderson 2004, p.13). All known populations are within 13 miles of each other and collectively occupy approximately 252 hectares (623 acres) (Colorado Natural Heritage Program (CNHP) 2006, p. 3). There have been many surveys of potential habitat over the years, but there also is potential habitat that remains unsurveyed for lack of access to private lands. These unsurveyed parcels are 16 hectares (40 acres) or smaller, with a scattering of plants visible from the road. None of the potential habitat identified to date extends beyond the reported range of the species. Reports of this species occurring in Arizona and New Mexico by the PLANTS National Database and state floras actually pertain to entities that were formerly treated as infraspecific taxa under *I. polyantha* (Anderson 2004, pp. 11, 15).

Population Estimates/Status

The total estimate was 2,246-10,626+ plants as of 2003 (Anderson 2004. p. 19).

Population estimates for the three known locations are:

1) Pagosa Springs

In 2003 there were 2,000-10,000+ plants on private land, highway right of way (ROW) and Town park land. Surveys in 2005 found much higher densities of plants. In 2005 and 2006 a 1 hectare (2.3 acre) site of private land south of the fairgrounds was sampled. Samples of plant density there showed about 40 plants per square meter and an equal or greater number of rosettes. This site was used for snowmobile races in 2006, the effect on plants will be monitored in 2007. All occupied habitat is still within the known range of the species. Other *Ipomopsis* species in the area were also unusually abundant in 2005.

2) Dyke

In 2006, 82 flowering plants and 209 rosettes were on a Colorado Department of Transportation (CDOT) ROW and adjacent private pasture. In 2005, the numbers were similar (97 flowering plants, 230 rosettes) The BLM population starts upslope a few hundred meters from the ROW and continues northward. founding 2006 on the BLM land, there were 88 flowering plants and 164 rosettes.

3) Mill Creek

In 2002, 126 plants were on highway ROW. The site has not been surveyed since

Fluctuations in plant numbers are not unusual for biennial *Ipomopsis* species, which can also live for several years as a nonreproductive rosette. *Ipomopsis sancti-spiritus* (Holy Ghost ipomopsis), a listed endangered species, is the closest known relative of *I polyantha.* Its population numbers

have fluctuated annually since observations began in the 1920s. Monitoring results for *I. sancti-spiritus* showed 150 to 650 flowering plants during various years, and a total number of plants that varied from 2,047 in 1996 to 250 in 2001 (U.S. Fish and Wildlife Service [USFWS] 2002, pp. 5, 7).

THREATS

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range.
The primary threats to the habitat for this species are development of commercial and residential property and county facilities, associated new utility installations, and ground disturbance on highway rights of way. The entire range of *I. polyantha* is planned for development in the Archuleta County Community Plan (Anderson 2004, p. 4). In this plan, all areas occupied by *I. polyantha* on private land are planned for low (35+ acres), medium (3-35 acres), or high (2-5 acres) density housing. This is 44 percent of the occupied habitat. Many residents are expected to graze horses on their parcels. In one subdivision, many scattered plants are visible from the road. Residential development is increasing rapidly in the county. In 1997 the population of Pagosa Springs was 1,767; the projection for 2020 is over 9,000.

A "big box" retail outlet center has been proposed on occupied habitat near the center of distribution for *I. polyantha.* A ski resort village with 2,200 residential units is proposed for development at the nearby Wolf Creek ski area. The village would not impact potential habitat for the plant, but it would increase pressure for wider roads and more retail outlets around Pagosa Springs. Both of these projects are proceeding through multi-year approval processes.
More imminent is the recent proposal by the county to locate new buildings on the site of the largest and most dense population of *I. polyantha.* This location was also the site of snowmobile drag races in February 2007. This event involved snow removal and grooming over the frozen ground. The impact on this year's plant rosettes will not be measurable until the spring.

Most populations not on private land are on highway rights of way (53 percent). Highway right of way habitat is vulnerable to highway construction, spraying and mowing of grass and weeds and utility construction or maintenance that result in direct destruction of *I. polyantha* individuals or reduce the suitability of the habitat for this species (Anderson 2004).

In 2005-2006 a sewer line installation resulted in the loss of about 165 adult plants and 172 rosettes; some of the rosettes were transplanted. CDOT and Archuleta County consulted with the Service and agreed on avoidance measures for this project, but contractors failed to follow the protocol. At another location, a private landowner mowed several hundred feet of occupied habitat along the highway without consulting CDOT.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes.
Wildflower gathering may occur along highway rights of way, but there are no reports of overutilization.

C. Disease or Predation.
All observations suggest that *I. polyantha* does not tolerate livestock grazing (Anderson 2004, p.

22). This is based on observation of the fence line effect at several locations, where planbts were not found on the side of the fence where livestock were grazing. We have no data to indicate whether the plant destruction results from herbivory or from trampling. Although it is not found in heavily grazed pastures, occurrences have been observed in lightly grazed horse pastures and abandoned pastures.

D. The Inadequacy of Existing Regulatory Mechanisms.
The U.S. Forest Service (USFS) and the BLM list *I. polyantha* as a sensitive species. The only population known on federal land is on a BLM proposed exchange parcel. The BLM conducts data analyses and field inventories with federal activity projects to determine the occurrence of sensitive plant species on lands managed by the BLM and affected by BLM actions. Inventories are used to determine potential impacts that BLM planned and/or authorized actions may have on sensitive plant species that have a high potential of occurrence within the area. The BLM completes Specialist Reports for Sensitive Plant Species in order to ensure compliance with the National Environmental Policy Act. This information is used in the analysis and decision making process for all BLM actions that may lead to impacts to sensitive plant species within jurisdictional boundaries. These actions include but are not limited to grazing permit renewals and land exchanges.

E. Other Natural or Manmade Factors Affecting Its Continued Existence.
Narrow tolerance of edaphic conditions limits the species to a 13-mile range on outcrops of Upper Cretaceous Mancos Shale. The results of seed germination experiments suggest that the species has specific physiological requirements for germination and growth that might prevent its spread to other locations.(Anderson 2004, p. 25). *I. polyantha* is a facultative outcrosser; fragmentation of habitat may cause gene flow to be obstructed. Signs of inbreeding depression have been observed in small populations of similar species (Anderson 2004, p. 27). Pollinator-mediated pollen dispersal is largely limited to the flight distances of pollinators. Thus, it is likely that the population of 120-500+ plants is genetically isolated from the other 2 populations several miles away. Roadside habitat for *I. polyantha* also has been shown to provide 44 percent less diversity in pollinator species than unused pasture habitat where a wider range of nectar and pollen resources are available along with water (Anderson 2004, p. 24)

As a biennial species, *I. polyantha* is vulnerable to environmental stochasticity. For instance, during drought years plants may remain as rosettes without flowering. It has a high rate of population turnover and high annual variability in reproductive effort.

Ipomopsis. polyantha is similar to its closest relative *Ipomopsis sancti-spiritus*, a listed endangered species, which also grows primarily on roadsides (USFWS 2002). Both species may have adapted to anthropogenic disturbance when their natural disturbance regime was altered.

CONSERVATION MEASURES PLANNED OR IMPLEMENTED

The USFWS made *Ipomopsis polyantha* a category 2 candidate species in 1985. The species remained a category 2 candidate until 1996. Since 1996 threats to the species have escalated along with development of its habitat. The USFWS added this species to the list of candidates again in 2005.

A Technical Conservation Assessment of the species has been prepared by David G. Anderson of CNHP for the USFS Rocky Mountain Region. This assessment cites an exhaustive list of 156 references pertinent to the species and its conservation status (Anderson 2004. pp. 51-58).

Potential Conservation Areas have been proposed by the CNHP to the San Juan National Forest and Archuleta County to facilitate awareness of this species and its habitat during planning and management activities (Anderson 2004, pp. 59-62). *Ipomopsis polyantha* is on the sensitive species list for the USFS, Region 2 and the BLM State sensitive species list because potential habitat is thought to exist on Federal lands in Archuleta County, but surveys have found only one occurrence. In 2005, one of the three populations was found to extend onto BLM land. The BLM parcel is being transferred to private ownership with a conservation easement to protect the plants.

CDOT has agreed to apply a protocol for avoidance and mitigation of impacts to plants during construction and maintenance projects on highway rights of way. A draft protocol was applied in 2005-2006 to a sewer line installation in consultation with the USFWS. Unavoidable plant rosettes (next year's adults) were transplanted from the project area. When contractors failed to follow the protocol an on-site consultation was held with USFWS, CDOT, Archuleta County and contractors to develop recommendations for minimizing the disturbance to the habitat and seed bank (Peterson 2006). Corrective measures were taken; results will be assessed in 2007.

La Plata Electric Association (LPEA) conducted a power line reconductor project in occupied Pagosa skyrocket habitat in 2006-2007. They implemented avoidance and mitigation methods in cooperation with the USFWSand CDOT. Monitoring in 2007 will measure effects on the plants.

A Pagosa skyrocket working group has been organized to coordinate ongoing protection activities. The group includes individuals from USFWS, CNHP, Colorado Natural Areas Program (CNAP), USFS, BLM, CDOT, Southwest Land Alliance, The Nature Conservancy, Southern Ute Tribe, LEPA, Colorado Native Plant Society, Pagosa Parks and Recreation, Archuleta County, and environmental consultants.

SUMMARY OF THREATS

- Residential and commercial development – potential destruction of about 44 percent of habitat
- Habitat destruction and disturbance on highway rights of way – 53 percent of known habitat
- Grazing and trampling by domestic animals and wildlife on private land and highway rights of way – 25 percent
- Regulatory protection is provided on about 1 percent of the habitat. Protocols to minimize

impacts apply to about 55 percent of the habitat.

- Extreme edaphic specificity limits distribution; and reduced pollinator availability affects about 55 percent of the population.

We find that this species is warranted for listing throughout all its range, and, therefore, find that it is unnecessary to analyze whether it is threatened or endangered in a significant portion of its range.

LISTING PRIORITY

THREAT			
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: High
The species is currently threatened throughout its narrow range at all but 3 percent of the habitat. The effects will be permanent for plants impacted by development on private lands (44 percent of the total). The effects on highway right-of-way habitat (53 percent of the total) could be high to low depending on the actions of construction and maintenance personnel.

IMMINENCE: Imminent
Habitat destruction for development is currently taking place and will continue according to county plans for development. Densely occupied habitat on 2.3 acres is being considered for a county building site in 2007. Power line construction through occupied habitat on highway right of ways and private land was completed on about 17 percent of the population in 2006. Sewer line was installed in about 5 percent of the occupied habitat in 2005. A newly discovered population on BLM land is being transferred to private ownership in 2007.

RATIONALE FOR CHANGE IN LISTING PRIORITY NUMBER

YES Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed?

Is Emergency Listing Warranted?

No. The species is threatened throughout its range, but the development and construction activity will take portions of the habitat as it proceeds. The procedure for reporting, consulting, avoiding and mitigating impacts to the habitat is now in place. The species is not likely to be extirpated within the next year.

DESCRIPTION OF MONITORING

Anderson's technical assessment (2004) provides the baseline data for review of this species. In September 2004, the Colorado Rare Plant Technical Committee held a symposium for review of the listed and candidate species in the state. Reviewers agreed that *I. polyantha* was the top priority species in need of protection. In 2005, the CNHP conducted surveys of nearly all known populations and accessible suitable habitat with the help of USFWS, USFS, and CDOT biologists as well as private consultants and volunteers. Individual plants and rosettes were counted on highway right of ways and locations were documented with GPS readings. Dense populations and those on the private side of the fences were estimated. The 2005 information was entered into the Biotics 4 data system at CNHP. Sample areas were resurveyed and additional potential habitat on private lands was surveyed in 2006.

COORDINATION WITH STATES

No Colorado agency has authority for plants. The USFWS met with the CNAP 3 times, the CNHP 21 times, and the CDOT 8 times regarding the status and threats to the species and conservation measures planned and implemented. There are no plant species included in State Wildlife Action Plans as species of conservation concern.

LITERATURE CITED

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U.S. Fish and Wildlife Service. 2002. Holy Ghost Ipomopsis (*Ipomopsis sancti-spiritus*) Recovery Plan. U.S. Fish and Wildlife Service, Albuquerque, New Mexico. 51pp.

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions, or removal of species from candidate status, and listing priority changes.

Approve: _____ 5-9-07
Regional Director, Fish and Wildlife Service — Date

Concur: _____ _____
Director, Fish and Wildlife Service — Date

Do not concur: _____ _____
Director, Fish and Wildlife Service — Date

Date of annual review: 3/12/2007

Conducted by: Ellen Mayo