STATUS SURVEY UPDATE
ON
Mertensia drummondii (Lehm.) G. Don

A Report by

Robert Lipkin
Alaska Natural Heritage Program
ENVIRONMENT AND NATURAL RESOURCES INSTITUTE
UNIVERSITY OF ALASKA ANCHORAGE
707 A Street, Anchorage, AK 99501

I. SPECIES INFORMATION

1. CLASSIFICATION AND NOMENCLATURE

A. Species or infraspecific taxon

1. Scientific name

a. Binomial or trinomial -
Mertensia drummondii (Lehm.) G. Don

2. PRESENT LEGAL AND FORMAL STATUS

A. International

1. Present designated or proposed protection or regulation -
None.

2. Other current formal status recommendations -

a. To be included in the "Atlas of Rare Vascular Plants of the Circumpolar Arctic" by the Conservation of Arctic Flora and Fauna Program (CAFF) under the Arctic Environmental Protection Strategy.

b. Ranked as G2Q by The Nature Conservancy (1995).

B. National

1. United States

a. Present designated or proposed legal protection or regulation - Listed as a Category 2 Candidate species by the U.S. Fish and Wildlife Service in the Federal Register of 93-09-30. The U.S. Fish and Wildlife Service has recently announced that it will no longer maintain a Category 2 Candidate list.

b. Other current formal status recommendations -
Ranked as N2 in the U. S. by The Nature Conservancy.

2. Canada

a. Present designated or proposed legal protection or regulation -
None.

b. Other current formal status recommendations -
Listed as Rare in the Northwest Territories and the Canadian Arctic and as Canadian Priority 1 (Argus and Pryer 1990; McJannet, Argus, and Cody 1995; McJannet et al. 1993).

Ranked as N1 in Canada by The Nature Conservancy (Argus and Pryer 1990).

C. State

1. Alaska

a. Present designated or proposed legal protection or regulation -
The State of Alaska does not give formal protection to threatened, endangered, or sensitive plants.

b. Other current formal status recommendations -
Ranked as S2 in Alaska by the Alaska Natural Heritage Program (1995).

3. DESCRIPTION (see Murray 1981)

C. Local Field characters

Mertensia drummondii is a striking and distinctive plant; when in flower it is unlikely to be confused with any other species in the American Arctic. The narrow leaves of small, non-flowering individuals (especially seedlings) could be confused with non-flowering individuals of *Rumex graminifolius*, which occurs at the Meade River sites, or *Plantago canescens*, which is found at the Kogosukruk River sites. The leaves of *Mertensia drummondii*, however, are entire and have distinctive pustulate or tuberculate hairs in contrast to the glabrous (and often hastate) leaves of *R. graminifolius*, or the non-tuberculate pubescence of *P. canescens*.

5. GEOGRAPHIC DISTRIBUTION

A. Geographical range

Mertensia drummondii is known from three widely separated areas in arctic Alaska and Canada (see Map 1). Two of the areas are in Alaska: one a stretch of less than 55 km along the Meade River near Atqasuk (south of Barrow), the other from approximately 250 km to the east on the Kogosukruk River near Umiat. At least five sites are in Canada's Northwest Territories, all located near Dolphin and Union Strait. The Meade River sites are all within less than 15 air miles of each other. The sites on the Kogosukruk River are all within less than 4 miles of each other.

B. Precise occurrences

1. Populations currently or recently known extant:

001 MEADE RIVER CAMP SITE
(USA: Alaska:North Slope Borough U.S.G.S. MEADE RIVER B3 1:63,360 Topographic map quadrangle; approximate location, lat. 70°28′09″N. long. 157°16′53″W)

The Meade River camp of the Naval Arctic Research Laboratory (NARL) was located just

south of the Atqasuk airstrip, approximately 90 km SSW of Barrow. The site is on the active dunes along the river, approximately 4.75 km east of the airstrip.

Elevation range:15M-20M
Date last observed:1994-07-06

002 ATQASUK SITE
(USA: Alaska:North Slope Borough U.S.G.S. MEADE RIVER C3 1:63,360 Topographic map quadrangle; approximate location, lat. 70°31′04″N. long. 157°24′13″W)

Located on sand dunes along the west side of the Meade River across from the mouth of the Usuktuk River, approximately 3.2km north of the village of Atqasuk. The dunes extend for at least 5km north to the Nigisaktuvik River but it is unclear if the population occupies the whole area.

Elevation range:15M-25M
Date last observed:1994-07-05

003 KOGOSUKRUK RIVER CAMP SITE
(USA: Alaska:North Slope Borough U.S.G.S. UMIAT C4 1:63,360 Topographic map quadrangle; approximate location, lat. 69° 35′39″N. long. 152°11′14″W)

Located along the Kogosukruk River, west of Dogbone Lake, approximately 25km north of Umiat, northern Alaska. The site consists of several dune blowouts along the west bank of the river just north of its confluence with the "Branch of Kogosukruk River" (name on USGS quadrangle). (This site and the other Kogosukruk River locations may, in fact, be one population.)

Elevation range:75M
Date last observed:1994-07-04

004 MEADE RIVER 1
(USA: Alaska:North Slope Borough U.S.G.S. MEADE RIVER C3 1:63,360 Topographic map quadrangle; approximate location, lat. 70°37′07″N. long. 157°23′42″W)

The site is on active sand dunes above a point bar on the south side of the Meade river, 9.5km by air NE of the mouth of the Nigisaktuvik River, 15 km north of Atqasuk.

Elevation range:15M
Date last observed:1994-07-10

005 KOGOSUKRUK RIVER CENTRAL SITE
(USA: Alaska:North Slope Borough U.S.G.S. UMIAT C4 1:63,360 Topographic map quadrangle; approximate location, lat. 69°36′ 12″N. long. 152°08′11″W)

Located along the Kogosukruk River, approximately 25km north Umiat, northern Alaska. The site consists of 4 - 5 dune blowouts within 750m of each other along the west and north banks of the river, 2.2km west of the east shore of Dogbone Lake. (This site and the other Kogosukruk River locations may in fact be one population.)

Elevation range:75M
Date last observed:1994-07-03

006 KOGOSUKRUK RIVER - BEAR LAKE SITE
(USA: Alaska:North Slope Borough U.S.G.S. UMIAT C4 1:63,360 Topographic map quadrangle; approximate location, lat. 69°37′ 00″N. long. 152°05′44″W)

Located along the Kogosukruk River, approximately 25km north Umiat, northern Alaska. The site is a dune blowout above the bank of the river, 1.3km north of the east shore of Dogbone Lake. (This site and the

other Kogosukruk River locations may in fact be one population.)

Elevation range:75M
Date last observed:1994-07-01

007 KOGOSUKRUK RIVER - SANDAL BAR DUNES SITE
(USA: Alaska:North Slope Borough U.S.G.S. UMIAT C4 1:63,360 Topographic map quadrangle; approximate location, lat. 69°36′ 49″N. long. 152°04′04″W)

Located along the Kogosukruk River, approximately 25km north Umiat, northern Alaska. The site consists of two adjacent dune blowouts above the east bank of the river, 1.2km north of the middle of Dogbone Lake. (This site and the other Kogosukruk River locations may in fact be one population.)

Elevation range:75M
Date last observed:1994-07-01

008 MEADE RIVER 2
(USA: Alaska:North Slope Borough U.S.G.S. MEADE RIVER C3 1:63,360 Topographic map quadrangle;approximate location, lat. 70°38′28″N. long. 157°19′17″W)

River bluff along the west bank of the Meade River approximately 15km northeast of the Atqasuk in northern Alaska. (Many of the *Mertensia drummondii* sites on bluff dunes along the Meade River may be part of one or two larger riparian sites.)

Elevation range:16M
Date last observed:1994-07-10

009 MEADE RIVER 3
(USA: Alaska: North Slope Borough U.S.G.S. MEADE RIVER C3 1:63,360 Topographic map quadrangle; approximate location, lat.

70°39′03″N. long. 157°16′10″W)

Dunes behind point bar on the south bank of the Meade River approximately 17km northeast of Atqasuk in northern Alaska (Many of the *Mertensia drummondii* sites on bluff dunes along the Meade River may be part of one or two larger riparian sites.)

Elevation range:16M
Date last observed:1994-07-08

010 MEADE RIVER 4
(USA: Alaska: North Slope Borough U.S.G.S. MEADE RIVER C2 1:63,360 Topographic map quadrangle;approximate location, lat. 70°39′28″N. long. 157°07′36″W)

Dunes on the south bank of the Meade River approximately 24km northeast of Atqasuk in northern Alaska. (Many of the *Mertensia drummondii* sites on bluff dunes along the Meade River may be part of one or two larger riparian sites.)

Elevation range:16M
Date last observed:1994-07-09

011 MEADE RIVER 5
(USA: Alaska: North Slope Borough U.S.G.S. MEADE RIVER C2 1:63,360 Topographic map quadrangle;approximate location, lat. 70°40′27″N. long. 157°02′24″W)

Dunes on the north side of the Meade River approximately 28km northeast of Atqasuk in northern Alaska. (Many of the *Mertensia drummondii* sites on bluff dunes along the Meade River may be part of one or two larger riparian sites.)

Elevation range:14M
Date last observed:1994-07-079

2. Populations known or assumed extirpated:
None known.

3. Historically known populations where current status not known:

All known Alaskan sites were visited for this report. I have been unable to determine the current status of the Canadian populations. At least one of them (Croker River Delta) was collected as recently as 1990. The remainder have not, to my knowledge, been reported on since the date the collections were made (see below, section II, Information Sources).

a. Croker River Delta (Canada: Northwest Territories: Melville Hills region; approximate location, lat. 69°17′N, long. 119°07′W)

Reported by the collector (see Cody, Scotter, and Zoltai 1992) as "modern seashore and marine plain".

Elevation range: 02M
Date last observed: 1990

b. Cape Young (Canada: Northwest Territories: approximate location, lat. 68°56′N, long. 116°56′W.)

Cape Young is at the west end of Dolphin and Union Strait. Reported by the collector (Parmelee 3076) as "DEW Line Site, Pin 2, . . . 4 mi. SS3 site" on a sandy stream bank.

Elevation range:
Date last observed: 1963

c. Clifton Point (Canada: Northwest Territories: approximate location, lat. 69°04′N, long. 118°45′W.)

Reported by the collector (Eirling 687) as

"Camp Necessity" at the west end of Dolphin and Union Strait.

Elevation range:
Date last observed: 1916

d. Wollaston Peninsula (Canada: Northwest Territories)

Reported by the collector (Jenness 410) as "Wollaston Land 69-70° N 115° W." The Wollaston Peninsula is located on the west side of Victoria Island, on the north side of the Dolphin and Union Strait.

Elevation range:
Date last observed: 1915

4. Locations not yet investigated believed likely to support other possible extant natural occurrences:
The full extent of the Meade River populations is not known. It would be useful to know how far upstream and downstream populations of *M. drummondii* are found. During the brief 1994 fieldwork, the populations appeared to become sparser the farther downstream we went. Tributaries of the Meade containing similar dune formations, especially the Usuktuk River and Nigisaktuvik River, should be investigated. These areas can be surveyed relatively inexpensively by a small inflatable boat with motor, or by hiring a boat and guide at Atqasuk. Several residents are both knowledgeable and interested in the natural history of the area and furnished additional locations for *Mertensia* in 1994. These residents travel the river on a regular basis and should be encouraged to report on new sites.

The area north and east of the Kogosukruk River contains many small dune and blowout areas seemingly similar to the *Mertensia* sites. These could be mapped from available aerial photography but would require a helicopter for access.

5. Reports having ambiguous or incomplete locality information:
Several collections are known from the Meade River with only a general description of the site. These collections are likely to be from one of the sites noted in this report.

There are several additional Canadian locations that have been reported but which I have not yet been able to confirm. These locations include one site southwest of the Croker River site, two locations on the Parry Peninsula, and one location south of the Parry Peninsula. These locations are presumably based on collection records and should be checked.

6. Locations known or suspected to be erroneous reports -

None.

7. Locations of potential habitat checked but plants not found -

During our 1994 field work we were able to stop at several dune sites northeast of the Kogosukruk River which seemed similar to the Kogosukruk sites (see Map 2). None of these sites contained *M. drummondii*.

Several dune areas along the Meade River south and north of Atqasuk have been visited in the past without finding *M. drummondii* (Murray 1981, and pers. observ. of the author). Other sand exposures in the National Petroleum Reserve, Alaska (Fish Creek, Pik Dunes et al.) have also been surveyed without finding *M. drummondii* (Murray 1981).

C. Status and location of presently cultivated material - None known

6. GENERAL HABITAT DESCRIPTION

A. Concise statement of general environment and habitat -

Active sand dunes and blowouts near rivers; also on sandy banks and other sand (and possibly gravel) areas near the coast (Canada). Found only in the arctic. All Alaskan sites are on sand dunes and blowouts along two rivers- the Kogosukruk and the Meade. The area between these rivers is underlain by extensive deposits of Quaternary aeolian sands (see Map 3) that range from the Colville River west to the Meade River (Carter 1981, 1983, 1993, Dinter et al. 1990, Galloway and Carter 1993). The known populations are all on river bluffs or well back from and above the active floodplain. Populations are not found on recent point bar deposits subject to regular seasonal flooding.

B. Biological Characteristics -

The Meade River sites were all on active sand dunes similar to those studied at Atqasuk by Komarkaova and Webber (1980). *Mertensia drummondii* is found principally in the unit they map as seasonal desert herb, dominated by *Leymus mollis*, *Bromus pumpellianus*, and *Epilobium latifolium*. Vegetation typically had cover values of 5 - 15%, with some sites ranging up to 20%. Other common species included:

Artemisia glomerata
A. borealis
Festuca rubra
Eritrichium chamissonis
Rumex graminifolius
Carex obtusata
Dryas integrifolia
Senecio hyperborealis
Astragalus alpinus
Trisetum spicatum
Tanacetum bipinnatum.

It was also found in Komarkova and Webber's deciduous desert scrub unit dominated by low growing willows on elevated ridges. Principal species in this unit are *Salix glauca*, *S. alaxensis*, and *S. brachycarpa* ssp. *niphoclada*, along with *Bromus pumpellianus*.

The Kogosukruk River sites were in all in sand dune blowouts, generally well above the river and any regular flooding. Blowouts were typically surrounded by older stabilized communities of herbaceous, shrub

heaths with high lichen cover. Vegetation in the blowouts varied from protected areas that were well vegetated with willows (*Salix brachycarpa*, *S. hastata*) to more exposed areas of herbaceous communities having sparse cover. Deflation areas with gravel pavements at the mouths of several dunes were sparsely vegetated and contained only scattered small individuals of *M. drummondii*. Common species of the herbaceous dune communities included:

Carex obtusata
C. lachenalii
Festuca rubra
F. brachyphylla
Astragalus alpinus
Plantago canescens
Solidago multiradiata
Salix brachycarpa ssp. *niphoclada*
Bromus pumpellianus
Dryas integrifolia
Cnidium cnidiifolium
Eritrichium chammissonis
Pulsatilla patens.

M. drummondii was typically absent from smaller blowouts (i.e. less than 50m across).

Other rare or vulnerable species:
On at least two sites (numbers 004 and 010) there was a gradation from raised dune areas to point bar deposits. At these sites *M. drummondii* was occasionally found at the margins of the point bars. These bars (subject to regular flooding) were dominated by grass and herb species, most notably the rare endemic grass *Poa hartzii* ssp. *alaskana* (Plate 4). This rare species is only known from collections on the Meade River and from Bear Creek near Lake Peters in the Arctic National Wildlife Refuge. It is a tufted grass with stems having a distinctive reddish brown color at the base and frequently forming large, dense clumps. It was only seen in sands along the active floodplain of the river and was conspicuously absent from most sites that contained *M. drummondii*. Further work is needed to determine its range and abundance.

7. POPULATION BIOLOGY OF TAXON

A. General Summary -

Although there is difficulty in defining what constitutes an individual of *M. drummondii*, it is reasonable to assume there are at least 50,000 ramets at the Alaskan sites. These seem to be clustered in a relatively small geographic area (less than 50 miles of stream length or 5,000 hectares). The size of the Canadian populations is not known, though at least one of the collections (Parmelee 3076) notes that it was rare.

B. Demography -

This project was not intended to provide an accurate census or comprehensive population sampling, and the limited field time did not allow for sampling of all populations. In an effort to arrive at some estimate of population size I used 1m wide belt transects to sample several of the sites. These transects were laid out perpendicular to the axis of the blowouts or dunes so as to traverse areas of high and low densities of *M. drummondii*, and provide an overall density for each blowout. The area of each blowout was then estimated from aerial photography and used to arrive at a population estimate. Several factors complicated this process, the most troublesome being arriving at a practical definition of an individual. In many cases apparently separate ramets were joined together below ground, while in other cases plants immediately adjacent to each other were separate individuals (Plates 3 and 4). Large clumps up to 0.5m in diameter arose from a much branched "caudex", and could be interpreted either as one large individual or the result of many seeds germinating from one capsule with subsequent grafting between the roots. We counted all widely separate ramets as individuals, trying to err on the conservative side. Overall densities ranged from 0.02 m^2 to 0.6 m^2, with individual transects as high as 9.9 m^2 in dense stands.

001 MEADE RIVER CAMP

Relatively sparse over almost all of this area with densities generally less than 0.04 m^2. The overall population was approximately 10,000 ramets. We saw few large clumps and few seedlings;

large areas contained no individuals.

002 ATQASUK
No transects were made and the full extent of the population is not known. *M. drummondii* was relatively sparse at the south end of the site but at higher densities (with many seedlings) across from the mouth of the Usuktuk River. Very few large clumps were seen. The overall population was at least 7,000 ramets, and probably more.

003 KOGOSUKRUK RIVER CAMP
M. drummondii was locally common within the dunes and both non-flowering and flowering plants were present. Plants were found as solitary and multiple stems and as large clumps up to 50 cm across. Seedlings were also common. The total population depends on the definition of an individual, but there were at least 7 - 12,000 ramets.

004 MEADE RIVER 1
A brief stop was made at this site. The total population was estimated to be at least 3,000 ramets.

005 KOGOSUKRUK RIVER CENTRAL
M. drummondii was locally common within the dunes and both non-flowering and flowering plants were present. Plants were found as solitary and multiple stems and as large clumps up to 50 cm across. Seedlings were also common. The total population depends on the definition of an individual, but there were at least 10,000 ramets.

006 KOGOSUKRUK RIVER - BEAR LAKE
M. drummondii was locally common within the dunes and both non-flowering and flowering plants were present. Plants were found as solitary and multiple stems and as large clumps up to 50 cm across. Seedlings were also common. The total population depends on the definition of an individual, but there were approximately 5,000 - 7,500 ramets.

007 KOGOSUKRUK RIVER - SANDAL BAR DUNES
M. drummondii was locally common within the dunes and both non-flowering and flowering plants were present. Plants were found as solitary and multiple stems and as large clumps up to 50 cm across. Seedlings were also common. The total population depends on the definition of an individual, but there were approximately 5,000 - 7,500 ramets.

008 MEADE RIVER 2
Only a brief stop was made at this site and it is unclear how extensive the population is. Densities were fairly high and the population of *M. drummondii* can be expected to number at least several thousand ramets, possibly many more.

009 MEADE RIVER 3
This site was marginal habitat for *M. drummondii*, being closer to a point bar deposit. *Mertensia drummondii* was rare and very few of the plants were flowering. Most plants occurred singly with 2-6 leaves or in very small clumps. The total population was probably less than 1,000, and very likely only a few hundred. *Poa hartzii* ssp. *alaskana* was a prominent, occasionally dominant, part of the point bar community.

010 MEADE RIVER 4
No estimates of population size. Relatively sparse and likely to be less than 3,000 individuals.

011 MEADE RIVER 5
Only a few, widely scattered individuals were seen.

C. Phenology -

Plants were in early flower by 29 June 1994 at the Kogosukruk sites. The phenology of the Meade River site populations seemed to be two weeks later than the Kogosukruk sites.

D. Reproductive biology

1. Types of reproduction and discussion

Presumed to be outcrossed and pollinated by insects; butterflies were observed visiting these flowers on the Kogosukruk River in 1994 and the flowers are strongly scented in life. The plants grow in large clumps and it is unclear if these represent one or more genets. The much twining roots might result from either several seeds (from one or more capsules) germinating together in a favorable site with the roots subsequently twining and grafting together, or from one plant producing many twining roots.

The plants seem to be well adapted to survive burial by sand; wind scouring and excavation is a more likely cause of mortality.

9. CURRENT LAND OWNERSHIP AND MANAGEMENT RESPONSIBILITY

Without doing a complete search of land records it is impossible to fully determine land ownership for many of these sites. All of the Alaskan sites fall within the general bounds of the National Petroleum Reserve, Alaska, managed by the Bureau of Land Management. These sites are also within the North Slope Borough and some sites may have native allotments or other claims by the Arctic Slope Regional Corporation. Sites near Atqasuk are likely to be under the jurisdiction of the Atqasuk Village Corporation.

10. MANAGEMENT PRACTICES AND EXPERIENCE

Bureau of Land Management personnel at the Arctic District office are aware of and interested in the *Mertensia drummondii* populations and provided transportation by helicopter to the Kogosukruk River site. No special management practices are in effect, though sand extraction operations at Atqasuk have been reviewed in the past.

11. EVIDENCE OF THREATS TO SURVIVAL

A. Present or threatened destruction, modification, or curtailment of habitat or range -
Concerns have been raised in the past over possible threats at Meade River sites from ATV use and sand extraction for local construction or oil exploration

and development. As of 1994 ATV use did not seem to pose a serious threat to populations, and is not likely to unless there is a major increase in use. Certainly, a small dune area immediately north of the village shows considerable signs of ATV use and lacks *Mertensia drummondii*, but it is not clear that this site ever contained a population of this plant. Sand dredging or excavation also poses no threat at present and it seems feasible to avoid known populations with reasonable cooperation among village, federal and commercial interests. Large scale development projects (oil and mineral exploration and road construction) could pose a threat to populations along the river unless provision is made for their conservation. There was also some concern over a possible long term threat to Canadian populations from a proposed gas line corridor. The status of this gas line should be checked, but is reportedly no longer being actively considered.

B. Overutilization for commercial, recreational, scientific, or educational purposes -
None known. Although *M. drummondii* is common on the Meade River sites near Atqasuk, I am unaware of any use of this plant by residents of the village. The few collections that have been made of this plant by botanists should have had little or no effect on the populations.

C. Disease or Predation -
None known. We saw no evidence of grazing or disease at any of the Alaskan sites.

D. Inadequacy of existing regulatory mechanisms-
Existing regulatory mechanisms have had little effect (positive or negative) on this species in the past. Only the sites near Atqasuk receive any significant use by people and no special management is necessary at the current level of use. Large scale development projects (such as oil or mineral exploration and development) should prompt a reevaluation of the adequacy of these mechanisms.

E. Other natural or manmade factors -
Mertensia drummondii grows in areas of high natural disturbance and appears to well adapted to this

environment. It may even require repeated disturbance to maintain open areas with little competition from other species. It is not clear why the range of this species is restricted to such a limited area despite the availability of seemingly suitable habitat over a much larger area. Its restriction in Alaska to two relatively small areas makes it inherently vulnerable to extirpation should any major changes occur in these areas.

II. ASSESSMENT AND RECOMMENDATIONS

12. GENERAL ASSESSMENT OF VIGOR

Although there is little real basis to evaluate trends, populations at all known collection sites in Alaska appear to be maintaining themselves.

13. RECOMMENDATIONS FOR LISTING OR STATUS CHANGE

The known Alaskan populations appear to be healthy and in no immediate need of protection. Until additional populations are found, the restricted range of this species warrants concern for extirpation in Alaska, but it would be hard to justify a proposal to list *M. drummondii* as Threatened at this time. Further fieldwork aimed at finding additional sites could ease concerns over the present known range or, conversely, highlight its true rarity and restricted range.

14. RECOMMENDED CRITICAL HABITAT

None recommended at this time.

15. CONSERVATION/RECOVERY RECOMMENDATIONS

A. General conservation recommendations

BLM is aware of the site near Umiat (Kogosukruk R.). No special actions are being taken.

B. Monitoring activities and further studies recommended-

Little is known about the biology of this striking endemic. The most basic need would be additional inventories to determine its range in Alaska and Canada. Its present distribution suggests it is a relictual species adapted to the widespread sand sheet and sand dunes that once covered much of the Arctic Slope (Carter 1981, Dinter et al. 1990, Galloway and Carter 1993). Although the present study makes it clear

that *Mertensia drummondii* is common along portions of the Meade River, additional surveys, especially upriver from Atqasuk, are needed to determine its true range and abundance. Adjacent rivers may feature similar dune exposures and should also be surveyed. The area between the Meade River and the Kogosukruk River contains many sand exposures and blowouts that appear to offer suitable habitat. None of these sites that have been visited to date have contained *M. drummondii*. The distribution of this species in Canada is also not well known and further work should be encouraged to document its range.

Sites in Alaska should be revisited periodically to determine population trends, reproductive success, and to obtain better estimates of population size. Basic biological information is needed, such as its dependence on pollinators and resistance to disturbance. Determining the abundance of this species, its population trends, and its resistance to disturbance would allow us to evaluate whether future development poses any threat to this endemic species. The Meade River populations are relatively accessible and offer a good opportunity for future studies. *Mertensia drummondii* affords an exceptional opportunity to involve students at Atqasuk in a meaningful program to monitor the status of this species and to look for additional sites.

16. INTERESTED PARTIES

Alaska Natural Heritage Program, University of Alaska, Anchorage;

Office of Endangered Species, U.S. Fish and Wildlife Service;

U.S. Bureau of Land Management, Arctic District;

Herbarium, University of Alaska, Fairbanks;

Village of Atqasuk;

Atqasuk Corporation, Atqasuk, Alaska.

III. INFORMATION SOURCES

17. SOURCES OF INFORMATION

A. Publications

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B. Museum collections consulted -

HERITAGE PROGRAM SITE 001: MEADE RIVER CAMP

1976 KOMARKOVA, V., HANSELL, H., SEABERT, K. 170; 70 air miles S of Point Barrow, near

Eskimo village of Atkasook; 4.75 km east of Meade River Camp. 15m. (ALA!)

1977 RACINE, C. s.n. Vic. Meade R. NARL camp, Atkasook. Dunes.(ALA!)

1976 SWANSON 87; Meade River village. Sand dunes near Meade River camp. (ALA!)

HERITAGE PROGRAM SITE 002: ATQASUK

1994 LIPKIN, R. 94-44; Atqasuk. Sand dunes north of village, across from mouth of Usuktuk R. (ALA!)

1966 ARGUS, G.W., CHUNYS, W. 5212; Meade River P.O. Eroded sand bank 1.5 miles north of village. (CAN!, GH!)

HERITAGE PROGRAM SITE 004: MEADE RIVER 1

1952 WARD, GEORGE 1175; Hollows between sand dunes, along N side of Meade River ca. 50 mi. S of Barrow Base. (CAN!, DS)

HERITAGE PROGRAM SITE 009: MEADE RIVER 3

1994 LIPKIN, R. 94-47; Meade River, approximately 17km northeast of Atqasuk. Sand dunes behind point bar on the south bank of the river. (ALA!)

HERITAGE PROGRAM SITE 010: MEADE RIVER 4 DUNES

1994 LIPKIN, R. 94-56; Meade River, approximately 24km northeast of Atqasuk. Sand dunes on the south bank of the river. (ALA!)

HERITAGE PROGRAM SITE 003: KOGOSUKRUK RIVER CAMP

1981 SEE, M.G. NS-120; Unnamed creek NW of confluence with Kogosukruk River, west of Dogbone Lake. (ALA!)

1994 LIPKIN, R. 94-23; Kogosukruk River, west of Dogbone Lake, approximately 25km north of Umiat. Sand dune blowouts along the west bank of the river just north of its confluence with the "Branch of Kogosukruk River". (ALA!)

1994 LIPKIN, R. 94-3; do. (ALA!)

1994 LIPKIN, R. 94-2; do. (ALA!)

HERITAGE PROGRAM SITE 006: KOGOSUKRUK RIVER - BEAR LAKE

1994 LIPKIN, R. 94-12; Kogosukruk River, approximately 25km north of Umiat. Dune blowout above the bank of the river, 1.3km north the east shore of Dogbone Lake. (ALA!)

HERITAGE PROGRAM SITE 007: KOGOSUKRUK RIVER - SANDAL BAR DUNES

1994 LIPKIN, R. 94-20; Kogosukruk River, approximately 25km north of Umiat. Dune blowouts above the east bank of the river, 1.2km north of the middle of Dogbone Lake. (ALA!)

CANADIAN LOCATIONS

1963 PARMELEE, J.A. 3076; 68° 56′ N 116° 56′ W; Plants of Mackenzie District Northwest Territories, Canada. DEW Line Site, Pin 2, (Cape Young). Rare on moist sloping sandy bank small stream through sparsely vegetated sand gravel region (?esker), 4 mi. SS3 site. (CAN!, DAO!)

1990 SCOTTER, G.W. 90-409; 69° 17′ N 119° 07′ W; Melville Hills region, NWT, Canada. Croker River Delta. Modern seashore and marine plain. 2m. (DAO)

1915 JENNESS, D. 410; 69-70° N 115° W Wollaston Land, (CAN!)

1916 EIRLING, H. 687; "Camp Necessity", Clifton Pt., W. end of Dolphin & Union Strait. Canada. (CAN!)

C. Fieldwork

This report is based largely on fieldwork conducted by the author in 1994.

30 June - 4 July 1994: Kogosukruk River sites. Locations and survey routes are shown on Figures 4 and 5.
4 July 1994: Helicopter visits to sites northwest of Kogosukruk River (Map 2).
5 - 10 July 1994: Meade River sites. Locations and survey routes are shown on Figures 1 - 3.

D. Knowledgeable individuals

R. Lipkin, Alaska Natural Heritage Program, Anchorage, AK.

18. SUMMARY OF MATERIALS ON FILE

All materials used to prepare this report are on file at the Alaska Natural Heritage Program.

IV. AUTHORSHIP

INITIAL AUTHORSHIP

Robert Lipkin
Alaska Natural Heritage Program,
University of Alaska Anchorage,
707 A St. Suite 208
Anchorage, AK 99501

MAINTENANCE OF STATUS REPORT

U.S. Fish and Wildlife Service
Anchorage, Alaska 99503.

V. NEW INFORMATION

N/A

VI. APPENDICES

A. Maps 1 - 3.
B. Figures 1 - 5.
C. Plates 1 - 6.