

ASTER YUKONENSIS RANGE EXTENSION IN NORTHERN ALASKA

Vast wilderness surveys shed light on candidate threatened species status

Figure 1. Yellow centers and violet petals characterize the Yukon aster, a candidate threatened plant species in Alaska. Recent surveys in Gates of the Arctic National Park and Preserve revealed that the plant is more widespread than previously thought.

By DONNA L. DiFOLCO

IN JULY 1993, NPS RESOURCE managers discovered a small population of *Aster yukonensis* (fig. 1) on an island in the Middle Fork of the Koyukuk River in northern Alaska, within several miles of the only documented location of the plant in the United States. This discovery spurred interest in searching for more populations of the plant in neighboring Gates of the Arctic National Park and Preserve (fig. 2). The NPS staff at Gates of the Arctic have since found more populations of the Yukon aster along the Middle and North Forks of the Koyukuk River. Resource managers have also identified the plant in the Kobuk Sand Dunes in Kobuk Valley National Park.

The Yukon aster, a violet petaled, thin leafed aster of the Composite family, is currently listed as a candidate species, category 2, for the threatened and endangered species list. Knowledge of the plant's range and status is not yet fully understood, hence its classification as a category 2 species. Until recently, the Yukon aster had been known to occur only in southwestern Yukon, Canada, and at one location on the Koyukuk River, Alaska. The National Park Service is mandated by the Endangered Species Act to protect threat-

ened, endangered, or candidate species of plants and animals within the areas it manages; Gates of the Arctic National Park and Preserve has undertaken the task to locate and map *A. yukonensis* within its borders to meet this mandate.

In late July, 1994, a resource management crew surveyed approximately 58 km (36 mi) of the Middle Fork Koyukuk River, searching for the plant on every gravel bar (fig. 3) on the park side of the river (generally the north bank) and each island that was mostly on the park side. For the first day-and-a-half of the survey, we searched in vain. Finally, we came across the first population of *A. yukonensis* on a gravel bar of the park border.

Once we located the first specimens, we walked from one end of the gravel bar to the other in parallel transects. We counted each *A. yukonensis* seen on the gravel bar, from the thick organic mat of the forest edge to the sparsely vegetated strip nearest the river. The first specimens located were examined carefully by looking for the densely glandular phyllaries (the narrow, leaflike bracts at the base of the flower) to confirm identification. After this, we used macroscopic features, such as the long, narrow clasping leaves, to identify the species more quickly, and to distinguish it from other species (mainly *A. sibiricus*).

Some river bars harbored so many of the Yukon asters that it was impossible to count them all. In these high density areas, we dispersed across the gravel bar, each person searching a different section and counting asters. Then the individual counts were combined into a minimum estimate for the total site count.

The search turned out to be much more successful than expected, as we found Yukon asters growing on nearly every gravel bar in a 40-km stretch (25 mi) of the river bordering the park. Most sites had from 50 to over 400 plants on the gravel bars. Two sites supported at least 1,000 plants each. The plants seemed to prefer sites mainly where river silt had accumulated at the upper and lower ends of gravel bars and along sloughs.

Directly after the confluence with the North Fork Koyukuk, we found only a few Yukon asters. The sudden disappearance of the large populations was puzzling. A change in soil type could be one reason for the decline. Less silt accumulates just below the confluence than along other parts of the river because the sedimentation regime has been altered by North Fork river water. Farther down river from the confluence, population sizes increased again, with counts in the 50-150+ range. These populations were made up of scattered individuals, much like the popula-

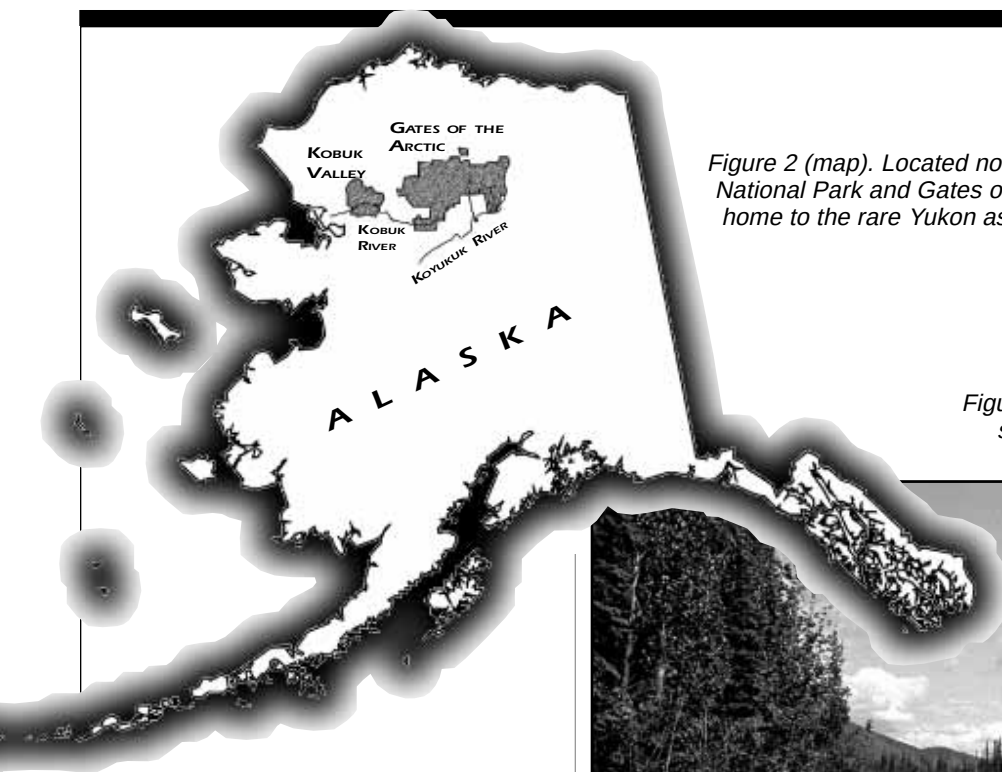


Figure 2 (map). Located north of the Arctic Circle in Alaska, Kobuk Valley National Park and Gates of the Arctic National Park and Preserve are home to the rare Yukon aster.

Figure 3 (photo). The aster grows along gravel bars, such as this one located on the Koyukuk River in Gates of the Arctic.

PHOTO BY DONNA L. DIFOLCO



tions where the first flowers were discovered. This type of distribution suggested that either the species was just getting established on the gravel bar or the soil type was not optimal.

About a month after the survey, a flood swept through the area, rivers swelling high above the 100-year flood water line. Concern that the flood wiped out the tenuous population of Yukon aster along the Middle Fork Koyukuk was relieved when biologists on a bird survey the following spring confirmed that some plants had survived the big flood.

In 1995, staff surveyed the North Fork Koyukuk River for the species, mapping more, albeit few and scattered, populations of the Yukon aster. Resource managers found 13 populations along the North Fork, totalling less than 300 individuals. We do not know whether more substantial populations existed before the 1994 flood or not. A second survey of the Middle Fork to reexamine gravel bars that supported sizeable populations of the aster might reveal whether the flood affected the flowers. If major floods have deleterious effects on populations of these rare plants, then this may explain why the plant is uncommon.

While *A. yukonensis* was being mapped on the Middle Fork Koyukuk River in 1994, it was also being discovered in the Great Kobuk Sand Dunes along the

Kobuk River in Kobuk Valley National Park (fig. 2). National Park Service personnel in Kobuk Valley found 23 populations of *A. yukonensis*, totalling about 1,500 individuals (Hunt, NPS, personal communication). The habitat types where the Yukon asters were found in the Kobuk Sand Dunes were similar to the silty-sand gravel bars they seemed to prefer along the Koyukuk River. The Kobuk Sand Dunes populations, found mainly in dune depressions, were not as robust in terms of density and numbers of individuals as some of the Middle Fork Koyukuk populations, but seemed to be better developed than the North Fork populations. Differences in soil type and the length of time since the last environmental extreme (e.g., flood or drought) may be reasons for variations in population densities.

The past two summers of field work have greatly expanded the known range of *A. yukonensis* in northern Alaska. The

plant is likely to occur in other areas as well. In summer 1995, Yukon asters were reportedly seen far into the mountains along Agiak Creek, a tributary of the Hunt Fork John River. As we gradually survey the vast areas of Gates of the Arctic National Park and Preserve and inventory its resources, we will begin to more clearly understand the distribution of rare plants such as *A. yukonensis*.

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