Rare Plant Species Surveys for the Michigan Department of Transportation: M-26 at Silver River, Keweenaw County.

MDOT project No. 213914



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Cover: *Clockwise from upper left:* Culvert under Silver River bridge, looking north (Bassett); Silver River, looking south toward bridge (MacKinnon); conglomerate rock outcrop (Bassett).

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Abstract

MDOT Project 213914 was surveyed for rare plant species and suitable habitat in summer 2022 to assess potential impacts of road improvement projects. M-26 at the Silver River bridge was surveyed by foot in May and August, 2022 to detect potential habitat for rare plants. No listed plant species were detected during these surveys.

Introduction and Methods

Surveys for rare plant species are required for this project to ensure compliance with regulations regarding potential impacts of road improvement projects on rare species. The project area is in Keweenaw County and spans M-26 approximately 500 feet west and east of the Silver River bridge, including a small portion of Brockway Mountain Road (Figure 1). Road construction will include a full replacement of the Silver River bridge.

We conducted a search of the Michigan Natural Heritage Database to identify rare plant species records and high-quality natural communities found within a two-mile buffer of the project area (MNFI 2022). Survey search efforts focused on species that have been observed within 200-foot buffer of the project area (Figure 1, Table 1) and targeted areas of suitable habitat for these species.

Two surveys were carried out during the 2022 growing season in this project area. These corresponded as closely as possible to early- and mid-season phenology to capture the changing plant species composition and abundance over the growing season and to maximize the chances to observe the target rare plant species. The early survey was conducted on May 26-27 and the mid-season survey on August 3.

In addition to searching for rare species, several other categories of observations were collected. These include presence and identification of non-native invasive species, high-quality habitats, and other notable features.



Figure 1. Overview map of MDOT project area 213914. Project area in red (also circled in red in inset, showing location along eastern extent of Keweenaw Peninsula. The project area is located on Brockway Mountain along M-26, approximately 500 feet west and east of the Silver River crossing, including a small portion of Brockway Mountain Road, Keweenaw County, Michigan.

Results and Discussion

Survey targets

Eighteen rare plant species have been documented within two miles of the roads impacted by this MDOT project (Table 1). These species were the targets for surveys in this project area. Of these species, eight are state-listed as Special Concern, nine are Threatened, and one is Endangered. Special Concern species are tracked by MNFI; however, they do not have the legal protections that Threatened and Endangered species do.

Table 1. Documented occurrences of rare plant species within 2 miles of the project area.						
Common name	Latin name	State status*	Target season			
heart-leaved arnica	Arnica cordifolia	E	June-July			
green spleenwort	Asplenium viride	SC	June-Sept			
calypso or fairy-slipper	Calypso bulbosa	Т	May-June			
sedge	Carex media	Т	June-July			
Ross's sedge	Carex rossii	Т	May-July			
pale Indian paintbrush	Castilleja septentrionalis	Т	June-July			
wild lilac	Ceanothus sanguineus	Т	June-July			
purple clematis	Clematis occidentalis	SC	June-Aug			
small blue-eyed Mary	Collinsia parviflora	Т	May-June			
ram's head lady's- slipper	Cypripedium arietinum	SC	May-June			
wild oat grass	Danthonia intermedia	SC	June-July			
rock whitlow grass	Draba arabisans	SC	June-Aug			
auricled twayblade	Neottia auriculata	SC	June-Aug			
purple cliff brake	Pellaea atropurpurea	Т	June-Aug			
butterwort	Pinguicula vulgaris	SC	June-Aug			
pine-drops	Pterospora andromedea	Т	June-Sept			
pearlwort	Sagina nodosa	Т	June-Aug			
downy oat-grass	Trisetum spicatum	SC	June-July			
* E = Endangered; T = threatened; SC = special concern						

No listed species were observed during these surveys. We observed suitable habitat for several species, in particular pine-drops (*Pterospera andromodea*, state threatened). This cryptic species may remain dormant in certain years and should be sought in future years, including on the adjacent Michigan Nature Association Mariner's Preserve at Silver River Falls. A small patch of a pearlwort (*Sagina* sp.) was observed in a damp crevice in volcanic bedrock directly adjacent to Silver River north of M-26 that was determined to be the non-native *Sagina procumbens* and not the state-threatened native *S. nodosa*. Similarly, a chickweed species

(*Cerastium sp.*) was observed and determined to be nodding chickweed (*Cerastium nutans*) and not the state-threatened short-stalked chickweed (*C. brachypodium*).

Description of vegetation

Surveys indicated three vegetation zones, a conglomerate outcrop ridge, mixed mesic forest, and the floodplain of the Silver River. These zones comprise a range of MNFI natural communities, including volcanic cliff, boreal forest, dry-mesic northern forest, and hardwood-conifer swamp (Kost et al. 2007). We describe each vegetation zone below, with special attention to characteristic species and potential threats, where appropriate.



Figure 2. Conglomerate rock outcrop north of M-26. (Left) North-facing cliff-face grading into boreal forest (T. Bassett); (Right) South-facing cliff-face looking down over M-26 (W. MacKinnon).

The conglomerate outcrop ridge comprised short cliff faces, steep slopes and talus along the north side of M-26 and to the east between M-26 and Brockway Mountain Road (Figure 2). This includes a power line corridor between M-26 and Brockway Mountain Road and old, weedy roadbed north of M-26 and east of Silver River (Figure 3). Portions of cliff north of M-26 grade into boreal forest and dry-mesic northern forest toward Silver River and Lake Superior (Cohen 2002, 2007). Dominant canopy species included northern white cedar (*Thuja occidentalis*),

white spruce (*Picea glauca*), trembling poplar (*Populus tremuloides*), balsam fir (*Abies balsamea*), buffalo berry (*Sheperdia canadensis*), common juniper (*Juniperus communis*) and bearberry (*Arctostaphylus uva-ursi*).



Figure 3. Conglomerate rock outcrop along powerline corridor (T. Bassett).

A mixed mesic forest lies south of M-26 and west of the Silver River Bridge, comprising a degraded boreal forest or dry-mesic northern forest. The land surface has been sculpted, in part, by old river channels. The soils and forest tend from dry-mesic near the river drainage to wetter heading south and west, grading into a hardwood-conifer swamp (Slaughter et al. 2007). Heading east along the river is a semi-open swamp (Figure 4). Near the west end of the project area an open, wet area has been filled with pea stone, apparently a former log landing or area of similar use. Near the river, canopy dominants include white birch (*Betula papyrifera*), trembling poplar, northern white cedar, white spruce and balsam fir. To the west on wetter soils, canopy dominants include yellow birch (*Betula alleghaniensis*), balsam poplar (*Populus balsamifera*), with an understory of black ash (*Fraxinus nigra*), alder (*Alnus incana*) and wetland herbs. Spotted knapweed was observed in an anthropogenic opening embedded within the mixed mesic forest here. A small population of the invasive plant crown vetch (*Securigera varia*)

was observed on the slope down to the Silver River at the edge of the parking area southwest of the Silver River bridge.



Figure 4. Mixed-mesic forest grading to swamp. (Left) Slope down to east bank of river (W. MacKinnon). (Right) Semi-open swamp adjacent to river (W. MacKinnon).

Finally, north and east of Silver River bridge a steep slope descends from Brockway Mountain Road down to the floodplain of Silver River. The open overstory of the floodplain includes red maple, northern white cedar, and balsam fir with an understory of and red-osier dogwood (*Cornus sericea*). This area is also characterized by exposed volcanic rock, including steep cliffs that parallel the river (Figure 5). There is evidence along the river here of possible nutrient loading, as indicated by dense algal growth in the streambed.

We recommend invasive plant treatment and monitoring, and continued monitoring for rare plant species. The disturbance associated with bridge replacement is likely to exacerbate existing invasive species populations, so treatment of crown-vetch and spotted knapweed within the

project footprint is strongly advised. Beginning treatment before or concurrently with this disturbance will increase the chances of control. Monitoring and follow-up treatments for up to three years following project completion are advised, as well.

Several rare species have occurred in the vicinity of the project area historically. Some are more likely to occur on the Lake Superior shore than in land, while others may well persist within or adjacent to the project. In particular, it would not be unlikely if surveys for pine-drops in future years revealed an extant population. Other species likely to be found in future surveys include green spleenwort (*Asplenium viride*, state special concern), pale Indian paintbrush (*Castilleja septentrionalis*, state threatened), ram's head lady's-slipper (*Cypripedium arietinum*, state special concern), and rock whitlow grass (*Draba arabisans*, state special concern).



Figure 5. Silver River and floodplain north of bridge. Note steep cliffs along bank and algal growth in streambed (*T. Bassett*).

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