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# INSECTS

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## OCCURRENCE OF THE ENDANGERED GOLD-EDGED GEM (*SCHINIA AVEMENSIS*) AT CFB SUFFIELD NATIONAL WILDLIFE AREA, ALBERTA

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### Introduction

The Gold-edged Gem (*Schinia avemensis* Hooper) is a small (16-20 mm wingspan) day-flying flower moth. Its forewings are greenish-brown and maroon, crossed by two partial yellow bands, with a prominent yellow band along most of the outer edge of the forewing. There are no named subspecies, and the egg, larval, and pupal stages have not been described.<sup>1</sup> The Gold-edged Gem is currently listed as Endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), meaning it faces imminent extirpation or extinction.

Gold-edged Gems have a very restricted and disjunct distribution in the arid regions of central North America; occupied sites are known to occur at one location each in Manitoba and Saskatchewan, two locations in

Alberta, and three sites in Colorado. Figure 1 shows the recorded locations of Gold-edged Gems in North America (the third location in Colorado is obscured on the map by the more northerly location in that state); the three black dots in the Canadian Forces Base (CFB) Suffield National Wildlife Area (the dark grey area within CFB Suffield) are new observations. Table 1 contains detailed location information.

Gold-edged Gems are found in close association with their larval host plant, the Plains Sunflower (Figure 2, see inside back cover). In addition to obtaining nectar from the host plant, Rush Skeletonplant is an important and perhaps primary nectar source used by adult moths.<sup>2</sup> Gold-edged Gems have been found only within active sand dunes and blow-outs in close association with the larval host plant.

Table 1. North American locations of Gold-Edged Gems

Location	Lat	Long	Observation	Source
CFB Suffield National Wildlife Area, AB	50.32034	-110.67806	2008	Direct - GPS obtained by authors
CFB Suffield National Wildlife Area, AB	50.62804	-110.31678	2008	Direct - GPS obtained by authors
CFB Suffield National Wildlife Area, AB	50.51340	-110.46063	2008	Direct - GPS obtained by authors
Pakowki Lake, AB	49.39800	-110.87500	2005	University of Alberta - Strickland Museum
Red Deer River, Bindloss, AB	50.93800	-110.41400	2004	University of Alberta - Strickland Museum
Spruce Woods Provincial Park, MB	49.66300	-99.28700	2004	University of Alberta - Strickland Museum
Burstall, SK	50.70000	-109.90800	2004	University of Alberta - Strickland Museum
Great Sand Dunes NP, Colorado	37.73467	-105.51000		Direct - GPS obtained by Charles Harp
Great Sand Dunes NP, Colorado	37.75267	-105.51000		Direct - GPS obtained by Charles Harp
2.5 mi NE of Roggen, Colorado	40.19533	-104.50583		Direct - GPS obtained by Charles Harp

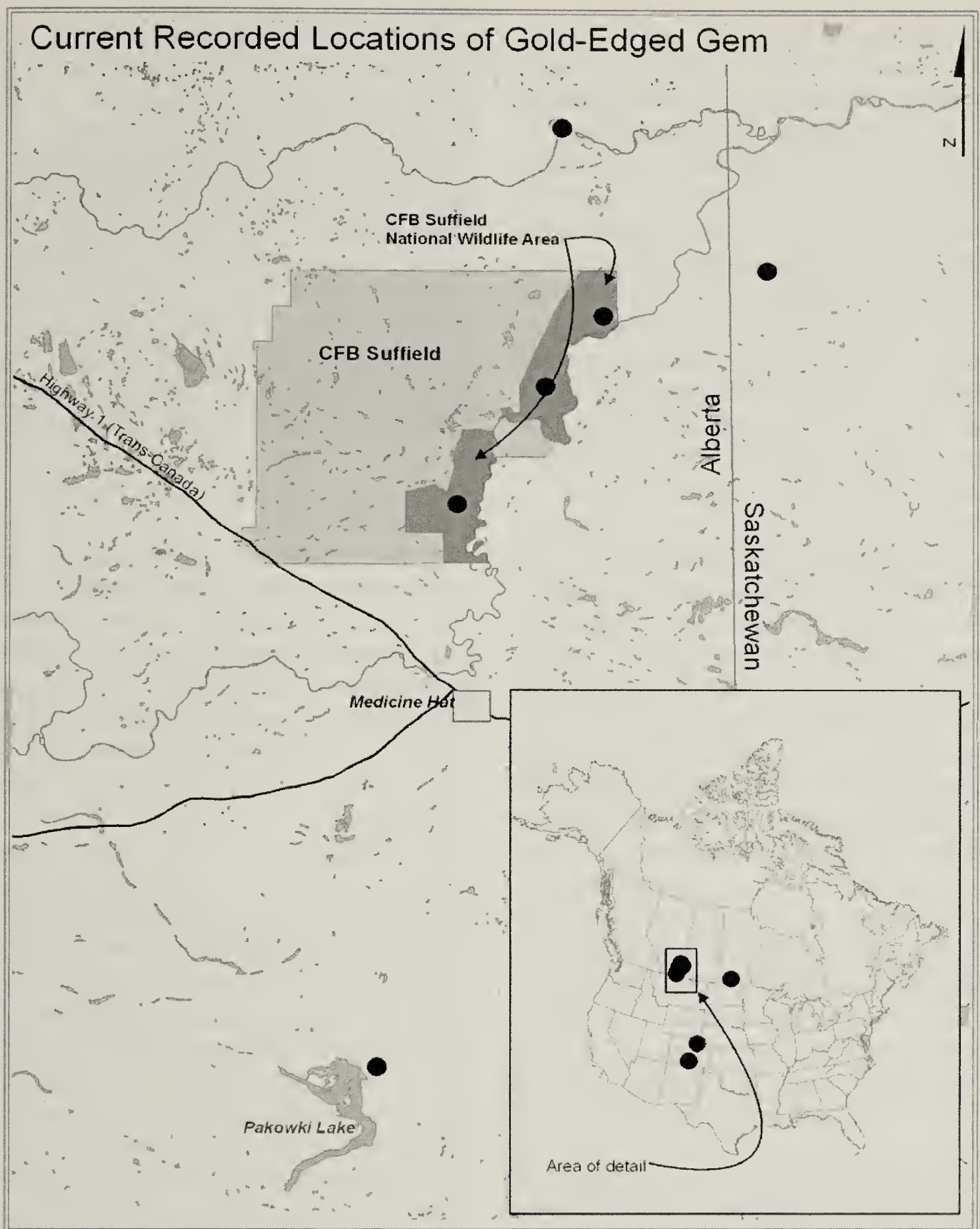


Figure 1. North American distribution of the Gold-edged Gem

In Canada, they are active throughout much of the day, from approximately 10 July to 20 August.

The main threat to the Gold-edged Gem is believed to be the loss of habitat resulting from stabilization of active sand dunes.<sup>1</sup> Active sand dunes are progressively becoming stabilized as a result of the current climatic conditions in combination with changes

in fire and grazing regimes.<sup>3,4</sup> Loss of habitat from the encroachment of native and invasive species is also a concern;<sup>1</sup> both Crested Wheatgrass and Baby's-breath were observed in the dune complex at Pakowki Lake in southern Alberta, as was Sweet-clover at the Spruce Woods site in Manitoba, both of which are active Gold-edged Gem habitats. The establishment of these non-native invasive species may

lead to the stabilization of dunes and the loss of native sunflowers and Skeleton Weed through competition.<sup>5,6</sup> It is also possible that the creation of roads or trail edges with Prairie Sunflowers in proximity to existing habitat may create sink habitat that further depresses local populations by drawing individuals of this species to areas where they may be subject to mortality from vehicle collisions or road grading. However, little is known about the specific factors affecting the conservation status of the Gold-edged Gem in Canada.

The CFB Suffield National Wildlife Area (NWA) is a 458-km<sup>2</sup> reserve of native grassland, active sand dunes, and coulees along the South Saskatchewan River in the grasslands of south-eastern Alberta. The two previously known Gold-edged Gem colonies in Alberta, at Pakowki Lake and along the Red Deer River north of Bindloss, are located south and north of the NWA, respectively. Between these two locations lie the Middle Sand Hills, which occur within the boundaries of the NWA. The purpose of this study was to determine whether the Gold-edged Gem occurs in CFB Suffield. The only other report of the Gold-edged Gem in Alberta is a historical specimen in the University of Alberta Strickland Museum collection labelled "Medicine Hat," which may have come from the Middle Sandhills, the closest dune habitat to Medicine Hat.

## Methods

On 11-12 August 2008, after determining that Gold-edged Gems were active at the Pakowki Lake site, potential habitat in the CFB Suffield NWA (i.e., active sand areas with blooming native sunflowers) was visited and searched for adult Gold-edged Gems. Several areas of the NWA with active dune habitat were searched, including

Amiens, Ypres, and Casa Berardi. An estimated 90-95% of the blossoms in or adjacent to active dunes were examined for resting adult moths, an effective method of locating Gold-edged Gems at other sites (G. Anweiler, pers. obs.).<sup>1</sup>

## Results

Single adult Gold-edged Gems were found at all three locations in the CFB Suffield NWA (Table 1): at the Dugway Dunes in area Casa Berardi at 522919E 5574298N, in the Middle Sand Hills in area Amiens at 548323E 5608686N, and in area Ypres at 538242E 5595854N (all locations are UTM 12 NAD 83). We searched an additional four dunes in area Ypres (537800E 595600N) and Amiens (547800E 5607100N, 545800E 5608800N, 544100E 5606300N) but found no Gold-edged Gems.

## Discussion

Gold-edged gems were observed in large numbers (more than 50 individuals) at the Pakowki Lake site, located approximately 100 km SSW of CFB Suffield. However, only single individuals were observed at the three sites where gems were found in the NWA. The difference in numbers observed may be attributable to differences in the amount and distribution of suitable habitat. Pakowki Lake comprises an extensive field of open dunes that are interconnected or separated by only small parcels of grassland vegetation. Cattle grazing in the area may be contributing to the maintenance of these dunes by removing vegetation and disturbing the soil. The sunflower colonies at the Pakowki dunes appeared to be larger and more numerous than at Suffield NWA. The active dunes at Suffield NWA are relatively small and separated by greater distances, which may limit dispersion and colonization of these areas. Additionally, it was our



Figure 3. Habitat of adult Gold-edged Gem at CFB Suffield National Wildlife Area

impression that sunflowers at the NWA were more thinly distributed over larger areas and also along the numerous disturbed roadsides. At the Pakowki Lake site, the colonies contained greater densities of plants in relatively discrete colonies within the active dunes themselves.

Observations of habitat characteristics suggest that the Gold-edged Gem may not only be a specialist with respect to macro-habitat features (sand dunes) but also micro-habitat features of these dunes. The only Gold-edged Gems we found on dunes at Suffield were located on small, sandy, partially vegetated slopes on the lee side of the dune (SE-facing slopes) in small concave depressions (Figure 3). We did not find the species in the relatively larger depressions within the dune where sand was actively being eroded by wind action.

The fact that only a few individual Gold-edged Gems were found within the Suffield NWA does not necessarily indicate that this is an insignificant population. More extensive and systematic surveys over a period of years are needed to determine the size of the Suffield population. Currently, two of the three Alberta sites with Gold-

edged Gems are on public lands and thus are offered some legislated protection. The Pakowki Dunes are Provincial crown land managed by Alberta Sustainable Resource Development. Suffield NWA is federal land managed by the Department of National Defence, and protection is afforded by both the *Species at Risk Act* and the *Canada Wildlife Act*. The land tenure of these habitats will, in part, determine the long-term protection, if any, of these habitats.

Now that the presence of this species within the boundaries of the NWA has been established, more systematic surveys are needed to determine the distribution of the species and the size of the population, as well as normal fluctuations in population size from year to year. Although survey timing is difficult given the short flight period of adult Gold-Edged Gems, stratification of surveys should clearly be directed at active sand dune regions of prairie Canada.

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