To the User:

Element Stewardship Abstracts (ESAs) are prepared to provide The Nature Conservancy's Stewardship staff and other land managers with current management-related information on those species and communities that are most important to protect, or most important to control. The abstracts organize and summarize data from numerous sources including literature and researchers and managers actively working with the species or community.

We hope, by providing this abstract free of charge, to encourage users to contribute their information to the abstract. This sharing of information will benefit all land managers by ensuring the availability of an abstract that contains up-to-date information on management techniques and knowledgeable contacts. Contributors of information will be acknowledged within the abstract and receive updated editions. To contribute information, contact the editor whose address is listed at the end of the document.

For ease of update and retrievability, the abstracts are stored on computer at the national office of The Nature Conservancy. This abstract is a compilation of available information and is not an endorsement of particular practices or products.

Please do not remove this cover statement from the attached abstract.

Authors of this Abstract: Carol Piening, 2343 11th Ave. East Seattle, WA 98102.
Revised by Mary J. Russo.

©
THE NATURE CONSERVANCY
1815 North Lynn Street, Arlington, Virginia 22209  (703) 841 5300
I. IDENTIFIERS

Common Name: MOUSEEAR  
Global Rank: G?

General Description:
Hieracium pilosella is a perennial herb, about 2.5 dm tall, arising from a very short rhizome with many fibrous roots.

Diagnostic Characteristics:
Hieracium pilosella can be distinguished from other hawkweeds by its solitary yellow flowers, its hairs, rosette growth form, and its stoloniferous habit.

II. STEWARDSHIP SUMMARY

Hieracium pilosella, mouse-ear hawkweed, is a stoloniferous rosette plant which forms dense patches to the exclusion of other vegetation. It does well on dry soils low in nutrients and is not tolerant of shade. Methods suggested for control of mouse-ear hawkweed have been directed at the dual goal of reclaiming once-productive pasture land and include selective fertilization and use of herbicides (2,4-D ester and versatil).

III. NATURAL HISTORY

Range:
Hieracium pilosella occurs in grasslands in England, Canada, the United States, and New Zealand. A native to England, it was reported as a weed in North America in 1902 and in New Zealand in 1920.

Habitat:
It has appeared in short tussock grassland previously dominated by fescue tussock (Makepeace 1985a). It grows in nitrogen deficient soils of Europe. In England it occurs in areas of low rainfall with well-drained, sandy soils of low soil water potential in summer which are also low in major organic nutrients (Bishop and Davy 1984). Watt (1962) found that a series of dry years led to the establishment of mouse-ear hawkweed in East Anglia.

Ecology:
Hieracium pilosella grows in dense mats, excluding other vegetation. Its major mode of reproduction is asexual but is tightly linked to flowering, as only plants which initiate inflorescences produce stolons and daughter plants (Bishop et al. 1978). After daughter plants have been produced, the mother plant dies.
Average plant age varied from study to study and site to site. In some populations individuals were replaced every one to two years, while others contained individuals up to 16 years old. If the soil in which mouse-ear hawkweed is growing is infertile, then a dense advancing front of plants will radiate from a bare center. On richer soils, inner gaps are filled when they occur. Grazing (by rabbits) was found to increase the length and double the number of stolons formed (Makepeace 1985a). Makepeace (1985b) found that mouse-ear hawkweed tends to establish on open sparsely-vegetated sites, and that seedlings sprouted only in years of higher-than-average spring rainfall. Seeds germinated most rapidly at 22 C. In the field, seeds germinated after moist intervals in spring and autumn.

In the rare instances a seedling survived beyond a few weeks, it reached adult size in 8 to 10 weeks. Mouse-ear hawkweed's dominance in an area once established is due in large part to its rosette growth pattern and stoloniferous reproduction, but it may also be allelopathic. Makepeace et al. (1985) found that umbelliferone, a known inhibitor of root growth, is present in mouse-ear hawkweed leaves and inhibited the growth of several species of clover. Alsike clover was the most effective competitor with mouse-ear hawkweed.

Watt (1981a, 1981b) has made long-term observations of mouse-ear hawkweed populations in England and over time has observed the establishment and rapid spread of an even-aged population of plants, followed by debris accumulation, surface leveling and stabilization coupled with plant senescence and subsequent plot diversification. In his study areas, a Festuca-dominated field was subsequently taken over by Hieracium pilosella, which in turn was being replaced by Thymus, although it was not clear whether Thymus was actively displacing the hawkweed or was filling in gaps left by the hawkweed's senescence.

Impacts:
In New Zealand, it has become a threat to pasture land and has shown its greatest increase in dry intermontane basins with a semi-continental climate. Hieracium pilosella forms a dense carpet of rosettes to the exclusion of other plants. In pasture and rangeland, it displaces native species, as well as agronomically important plants. It can spread rapidly and widely, increasing to 80% of ground cover (Makepeace 1985a), and taking over hectares of land.

IV. CONDITION

V. MANAGEMENT/MONITORING

Preserve Selection & Design Considerations:
If grasses are dominant in a selected area, fertilization can tip the balance in favor of grasses (see Management procedures).

There is some evidence (Watt 1981b) that over time a population of mouse-ear hawkweed senesces and is replaced by diverse species.
Management Requirements:
Hieracium pilosella needs to be managed to prevent it from displacing native species. Management procedures which have been used in pasture lands are discussed below.

Management recommendations in rangelands include introducing productive grasses and legumes and establishing planned rotational grazing (Anonymous 1980). Good competitors include white, alsike and red clovers, smooth brome and tall oatgrass. Watt (1981b) showed evidence that with time, a mouse-ear hawkweed population senesces of its own accord. It is not shade tolerant (Davy and Bishop 1984).

Davy and Bishop (1984) studied the effects of the addition of inorganic nutrients on Hieracium in Breckland grass-heaths. Quantities and compositions of salt mixtures used were the same as those used by Willis (1963), i.e., (weight in grams for treatment of one square yard of vegetation) 21.2 g (NH4)2HPO4; 10.6 g (NH4)2SO4; 21.1 g K2SO4; and 42.4 g MgSO4.7H2O. Nitrogen alone was added as NaNO3 (Davy and Bishop 1984). Applications were made by hand sprinkling dry mixtures on 11 occasions at about four-month intervals between October 1975 and March 1979. Fertilization on plots which were 50% or greater grasses was found to prevent the spread of mouse-ear hawkweed, with the effectiveness of NPK > NP > NK > N > no treatment (Davy and Bishop 1984). The decline of hawkweed populations in nutrient treated quads was rapid and striking due to two different mechanisms: (1) direct physiological and demographic responses to the increased nutrient supply; and (2) indirect effects arising from responses of competitors to increased nutrients (Davy and Bishop 1984). Fertilization should only be used to control hawkweed in areas where it can be expected to give preferred and established grasses a competitive edge. In this case, hawkweed can be shaded out.

Reader and Watt (1981) found a similar response to 336 kg/ha/yr NPK fertilizer for Hieracium floribundum. One application increased growth of POA COMPRESSA and temporarily halted hawkweed patch formation.

Makepeace (1985b) found that 2,4-D ester + "versatil" (active ingredient chloropyralid) at 1000 + 400 g/ha or 750 + 300 g/ha gave good control of hawkweed but also reduced the vigor of alsike clover. The clover recovered over time, the hawkweed did not. Three years of herbicide treatment with oversowing of clover were necessary to essentially eliminate the hawkweed.

Monitoring Programs:
A survey of the literature showed that Hieracium pilosella is a threat to pasture land in New Zealand and appears as a weed in Canada and the United States. The most recent research survey was published in 1985, and it is not known whether current research is ongoing.

VI. RESEARCH
Management Research Needs:
Research is needed to determine whether methods which have been used to control Hieracium pilosella in pasture lands, where the primary concern is to encourage the growth of agronomically important species, are compatible with the management goals on Nature Conservancy preserves.

VII. ADDITIONAL TOPICS

VIII. INFORMATION SOURCES

Bibliography:


IX. DOCUMENT PREPARATION & MAINTENANCE

Edition Date: 88-08-29

Contributing Author(s): Carol Piening, 2343 11th Ave. East Seattle, WA 98102. Revised by Mary J. Russo.