**Hieracium aurantiacum** (Orange Hawkweed), **H. praealtum** (King Devil Hawkweed) and **H. pilosella** (Mouse-ear Hawkweed)

**Volunteer Surveillance protocol**

**Alpine National Park and Falls Creek Alpine Resort**

1. **Aim**
   - To identify previously undetected populations of **Hieracium praealtum** (King Devil Hawkweed), **Hieracium aurantiacum** (Orange Hawkweed) and **Hieracium pilosella** (Mouse-ear Hawkweed) in the Alpine National Park and Falls Creek Alpine Resort.
   - To treat and kill all plants found.
   - Zero seed set of Hawkweeds in the Victorian Alps.

2. **Background**

   **Hieracium praealtum** (King Devil Hawkweed) and **Hieracium aurantiacum** (Orange Hawkweed) and **Hieracium pilosella** (Mouse-ear Hawkweed) are perennial herbs that are serious environmental and agricultural weeds in many temperate and subalpine areas of the world. All species currently have a limited distribution in Australia because they are in the early stages of establishment. However, the rapidly invasive nature of the species, observed locally, nationally and internationally, indicates the potential of Hawkweeds to become widely established in the Victorian Alps and therefore become serious weeds. All Hawkweeds are State Prohibited Weeds in Victoria, to be eradicated as soon as possible.

   **H. aurantiacum** has a basal rosette of leaves and a single stem 15-40cm tall. Plants produce bright, red-orange flower-heads in clusters of 5-15 heads at the top of the stem. **H. praealtum** can reach a height of 45cm but grows smaller on poor or shallow soils, or in exposed areas. The majority of leaves occur in a basal rosette. The species has yellow flower-heads in clusters of 3 – 35 at the top of the stem. **H. Pilosella** has leaves between 2 and 10cm long, broader above the middle, with whitish fine fur on the back. A single yellow flower grows on a stalk up to 40cm high. All species spread vegetatively by stolons and can form dense mats.

   Large areas of the Bogong High Plains are suitable habitat for the spread and establishment of **H. aurantiacum**, **H. praealtum** and **H. pilosella**, and all species have been found in a variety of habitats including grassland, wetland and shrubland. However, the current extent of Hawkweed on the High Plains appears to be limited by dispersal, with species following predicted patterns of wind dispersal and human/animal aided dispersal.

   The survey strategy for **H. aurantiacum**, **H. praealtum** and **H. pilosella** is to search as much of the Bogong High Plains as possible during the season. The survey will encompass both disturbed and undisturbed vegetation and some areas that are poorly accessible, i.e. far from vehicle access points, densely vegetated or difficult to walk through. The primary focus is to search for flowering plants but if a new infestation is found further searching for nearby rosettes is required.

   The exact search locations will be flexible depending on the season and the location of any new infestations.

3. **Method**

3.1 **Where**

   Surveys will be conducted around the Falls Creek Alpine Village and the Bogong High Plains

   The exact locations will be identified at the beginning of each survey session and are subject to change depending on the locations of new infestations.

3.2 **What**

   Search mainly for flowering plants; non-flowering plants are not easily observed but in certain situations searches for rosettes may be conducted under guidance of a Hawkweed Control Officer. Flowering plants of Orange Hawkweed are easily detected as there are no similar-looking indigenous or exotic species present in the area. King Devil and Mouse-ear Hawkweed is much more difficult to detect at a distance due to the abundance of yellow-flowered indigenous and exotic Asteraceae; however identification is easy at close-range.
3.3 **When**

Surveys will occur during the peak flowering period for both species, i.e. from mid December until late January.

Orange Hawkweed on the Bogong High Plains has been observed flowering from late November until mid-January. Flowering of King Devil Hawkweed has been recorded between early December and early April. King Devil usually flowers earlier than Orange Hawkweed.

3.4 **How often**

Hawkweeds have the ability to flower and set seed in 10 days. The seeds of Hieracium are normally dispersed within days of maturation and most can germinate immediately upon release.

Surveys will occur as often as possible during the peak flowering season.

3.5 **How**

3.5.1 **Searching**

- All searches are to be carried out on foot.
- Searching should be as systematic as possible using the line search technique.
- The distance between searchers will depend on the terrain/vegetation but should be approximately 2-3 metres apart; the actual distance will depend on the terrain/vegetation.
- Move slowly through the selected area; ensure that the area is searched completely and thoroughly.
- Search for flowering plants only. If a new infestation is detected search the immediate area (20m x 20m) for rosettes. If a new infestation is found in a drainage line (natural or constructed) search up and down slope for rosettes.
- Examine the rosettes of ALL seeding daisy heads but **APPROACH WITH EXTREME CAUTION** – do not cause seed to disperse.

**HYGIENE**

GREAT CARE MUST BE TAKEN TO ENSURE THAT PEOPLE, VEHICLES AND EQUIPMENT DO NOT CARRY ANY PLANT PROPAGULES WITHIN THE SITE, BETWEEN SITES OR OUT OF SITES.

All searchers must

- Wear gaiters or long pants to prevent seed spread via shoes, shoelaces and socks;
- Check all clothing, socks, shoes and shoelaces for seed when leaving an infested area.
- Brush of shoes and exposed clothing when leaving an infested area, scrub soles of shoes with cleaning solution provided when leaving infested areas **and the village**.

3.6 **Data**

All searches, regardless of whether Hawkweed is found or not, are to be recorded using the track log function of the GPS. At the end of each survey the Parks Victoria Hawkweed Co-ordinator will download the data and produce a map showing the location of the survey (together with the locations of any Hawkweed infestations found).

3.7 **Reporting and communication**

1. Any new infestations must be reported to the Parks Victoria Hawkweed Co-ordinator as soon as possible.
2. All new infestation recording sheets must be given to the Hawkweed Co-ordinator at the end of each survey session. All data collected will be added to the sites master sheet.
3. All new infestations will be added to the known infestation monitoring and control regime.
Hawkweed identification tips

Leaves can be/have:

- Upright
- Long hairs, on upper surface, much longer than any other species
- King Devil have sparser but longer hairs
- The backs of the leaves of King Devil Hawkweed only have hairs on the mid-vein and margin
- Orange HW has thicker hairs
- Smaller rosettes may have leaves flat on ground
- Colour varies but usually is grey green not bright green
- May have purple tinge especially on underside
- May have small purple spots where hairs protrude, particularly King Devil Hawkweed
- Smooth margins, not toothed or lobed at all
- Not ribbed
- Flowering stems, if present, are also very hairy, unlike any other species.
- Even the smallest specimens have stolons.

Links

Below are some links to websites about Hawkweeds, these are a good source of general background information

Victorian Department of Primary Industries

Tasmanian Department of Primary Industries, Parks, Water and Environment

NSW department of primary industries

British Columbian Ministry of Forests and Range – This is a good identification key for those who are botanically minded. All three species we are targeting are described in this text
https://www.for.gov.bc.ca/hfp/publications/00230/Hawkweed%20key_PNW_R3-June06.pdf