Guidelines for Rare Plant Surveys

Edited by Diana Bizecki Robson

INTRODUCTION

With the recent protection of some of Saskatchewan's rare plants under The Wildlife Act, industry will be required to conduct rare plants surveys as part of Environmental Protection Plans and Environmental Impact Assessments. However, there are currently no guidelines for surveys put forth by the Saskatchewan government. The absence of standards has resulted in variable quality surveys and little consistency in reporting rare plant occurrences in the province. The Native Plant Society of Saskatchewan has developed guidelines for rare plant surveys in the interest of identifying and protecting sensitive species, and in setting standards for industry.

These guidelines are intended for industry environmental co-ordinators, so they can better evaluate proposals and rare plant surveyor qualifications, for consultants so that they are aware of acceptable procedures and for the government so they can better evaluate the quality of rare plant survey reports.

Rare plant survey guidelines were produced for the California Native Plant Society by James Nelson (1987), and for the Alberta Native Plant Council by Jane Lancaster (1998). These guidelines were used as a template for the Saskatchewan guidelines.

RARE PLANTS AND BOTANICALLY SIGNIFIGANT ASSEMBLAGES

A rare plant species is any native species that, because of its biological characteristics or because it occurs at the fringe of its range, or for some other reason, exists in low numbers or in very restricted areas in Saskatchewan or in Canada.

Rare plant species that must be tracked during a survey are those plants on the Saskatchewan Conservation Data Centre's (SCDC) tracking list (1996). Those plants considered nationally rare by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) or the Canadian Museum of Nature (Argus & Pryer, 1990), or protected by Saskatchewan's Wildlife Act are particularly important to note. The status of a rare species may change as new information becomes available, so it is important to receive regular status updates from the appropriate organizations. Any plant that has not previously been found in the province–provided it is not an exotic species–would also be considered rare and should be carefully documented.

Botanically significant assemblages may include rare native plant communities like fescue grassland, or diverse, representative, undisturbed, endemic, disjunct or unusual communities of plants. The SCDC's database contains some information on rare plant

communities and will mention them when a rare plant search is performed. Whether other plant assemblages are considered unique or not is left to the judgment of the surveyor.

QUALIFICATIONS OF SURVEYORS

Deciding if a person has the qualifications necessary to conduct rare plant survey work can be difficult due to the variety of experience that people have. An examination of resumes as well copies of previous rare plant survey reports will help one assess the qualifications of rare plant surveyors and the quality of their work. In general, a rare plant surveyor should have:

* experience as a botanical field investigator;
* taxonomic experience and a knowledge of plant ecology (the surveyor should have some college coursework in plant taxonomy and ecology, and preferably be recommended by another professional botanist);
* familiarity with the local flora and potential rare plants in the habitats to be surveyed;
* familiarity with provincial and federal laws, and Saskatchewan Environment and Resource Management policies and regulations that pertain to rare plant protection and environmental assessment;
* a demonstrated ability to prepare detailed technical reports.

OBJECTIVES OF A RARE PLANT SURVEY

Rare plant surveys are undertaken to determine the presence and location of rare plant species and rare vegetation communities over areas proposed for development. Documentation of rare plant survey results and population data are required for government assessment of potential project impacts. Due to possible rare plant dormancy, a rare plant survey can only confirm the presence of rare plants on a site, not deny it. However, the more often an area is surveyed without finding a rare plant population, the lower the likelihood that a dormant population is present.

RARE PLANT SURVEY PROCEDURE

1.Review project proposal

In order to plan field work, conduct database searches and provide mitigative options, the surveyor should be familiar with various aspects of the project including the precise location, size and type of the disturbance, and location flexibility.

2. Collect information on potential rare plants

Obtain previous rare plant records for the project area by contacting the SCDC and the W.P. Fraser Herbarium. Conducting searches of the rare plant databases at both the SCDC and W.P. Fraser Herbarium is necessary since one may have information that the other doesn't. For example, the SCDC database may have rare plant sightings on record without a corresponding voucher specimen. In turn, the Herbarium may have a rare plant sighting in their database that has not yet been downloaded into the SCDC database (this is done every few months). Known occurrences of rare plants should be mapped onto topographic maps or air photos and taken into the field.

Also assess the likelihood of other rare plants appearing in the study area; the lack of database information could simply mean that no one has visited the area before. Potential rare species include those found in nearby areas and those found in similar habitats. Check floras, distribution maps, published reports and existing species lists for the area to help with the composition of a list of potential rare species.

Collecting information on potential rare plants is not a substitute for a survey. Database information is incomplete and rare plants are not always predictable in where they occur.

3. Study unfamiliar rare plants

Surveyors should familiarize themselves with herbarium specimens of potential rare species. Key characters useful in differentiating rare species from similar common species should be noted. Data from herbarium labels can be useful for determining likely habitat, flowering dates (and thus the best time for the survey) and associated species.

Determine when to conduct the survey

Determine when potential rare plants at the site will be easiest to identify (i.e. flowering stage), and when the plants reach that stage of maturity. By determining the best time to identify potential rare plants, the best time(s) to conduct the survey(s) will become apparent. Several visits may be required in one season to adequately survey for all rare plants.

Ideally, sites should be assessed over a number of growing seasons and moisture conditions for several reasons. First of all, many plants will not produce flowers during certain climatic conditions (i.e. very moist or dry years) making them difficult to spot and identify. Second, in a number of plant families with subterranean perennial organs (corms, bulbs, tubers etc.), above ground growth can be absent during the growing season for 1-2 years (and occasionally longer); typically this dormancy occurs in 25% or less of the population at one time (Lesica and Steele, 1994). Lastly, factors such as grazing and insects can affect the vigor and visibility of rare plants on a site.

Depending on the type and urgency of the project, only one survey may be feasible. If only a single rare plant survey can be performed, the best time to do it is in mid-late

summer. Early blooming rare plants will be in a seed stage and still potentially identifiable and later blooming species will probably be flowering.

Determine where to survey

During the survey, each representative plant community should be examined thoroughly. Over areas about a section in size (640 acres or 259 hectares), visiting all plant communities in a day should be possible except in very dense bush or treacherous terrain. Detailed surveys of areas slightly larger than this will take two to several days. Over very large areas the search should concentrate on as many likely habitats as is feasible. Examination of air photos and topographical maps may aid in the identification of likely rare plant habitats (i.e. active sand dunes, vernal pools/depressions etc.). However, since some rare plants will appear in habitats where you never expected to find them, every plant community type in the study area should be visited at least once. It may be useful to map the vegetation communities over large areas prior to conducting the survey to determine where to target field work. Mapping would help ensure that each major plant community type is examined.

6. Conduct the survey

A floristic survey technique should be used rather than quantitative vegetation sampling. Quantitative analysis techniques are inappropriate for rare plant surveys as they tend to over-represent dominant species and cover only small portions of an area. However, it is important to have a general community description to place any rare species found within a community context. Floristic techniques involve the identification of all plant species encountered to a taxonomic level where their rarity can be determined. For example, identifying a plant to genus (not species) may be adequate if that genus has no rare plants in it. Some rare plants are subspecies, so identifying only to species level would not be adequate in some situations. The names of the plants encountered should be recorded on a data sheet. A specimen of any unknown plants should be collected for later identification in a laboratory.

Systematic survey search patterns are recommended to minimize overlap and maximize coverage. Search patterns will depend on the topography and vegetation cover. Where conditions permit, walking a series of roughly parallel transects in a search unit will maximize coverage of the area. Spacing of the search transects will depend on the density of the vegetation cover, visibility through it, and the size of the plants in it.

7. Document rare plant sightings

The documentation of a rare plant population is the most important step in a survey. The client needs to know the precise location for mitigation planning, the SCDC needs the data to make rarity status decisions and the Herbarium needs the data to increase our scientific understanding of rare plants. Documentation can consist of:

* A voucher specimen and a rare plant occurrence form;
* Several photographs, a detailed description of the morphological characteristics and a rare plant occurrence form.

A voucher specimen should not be collected unless the local rare plant population has more than 20 individuals and the specimen will be donated to a Herbarium. Even then, the voucher should consist of only enough of the plant to confirm its identity (i.e. a single branch with several leaves and a few flowers and/or fruits). However, in certain plant families (i.e. mustards, adder's tongue) collecting a single branch may result in the collection of the entire above ground portion of the plant. In this case, an effort should be made to leave the root system intact. If an annual plant has only one branch, it should only be picked after most of the seeds (i.e. 90%) have fallen off the plant, if it is possible to identify it in this stage.

Photographs should be taken of the habitat, life form and diagnostic features (i.e. close-ups of the flowers or fruits) of a rare plant to help with relocation and identification of the plant(s). Photographs can be a substitute for a voucher specimen. However, if a voucher specimen will not be collected, measurements of leaf, flower and/or fruit width and length, and overall plant height should be recorded. Colour, shape and vestiture of the stems, leaves and reproductive structures, and type of inflorescence should also be recorded. The references used to key the plant out should be stated.

To ensure proper identification of rare species, a taxonomic expert should review all specimens and photographs/descriptions.

A rare plant occurrence form should be filled out whenever a rare plant population is encountered. This form includes spaces to record documentation information and location, habitat, population and collector data. A good Global Positioning System (GPS) can record very accurate location data although location can also be ascertained using maps or air photos. Required habitat data includes slope, aspect and elevation measurements, and descriptions of the drainage, habitat, associated species, land use and ecological setting. Population data to record includes the number of plants, a description of their areal coverage and phenological data. Collector data includes the name and contact information of the collector and the name of the botanist who reviewed the specimen/photographs.

8. Mark rare plant populations

For easier re-location and to facilitate avoidance during construction, rare plant populations should be marked with stakes and mapped on a topographic map or air photo.

9. Report any rare plant sightings

All Saskatchewan plant material vouchers collected should be contributed to the W.P. Fraser Herbarium at the University of Saskatchewan in Saskatoon or the G.L. Herbarium at the University of Regina. A rare plant occurrence form (available from NPS and SCDC) should accompany each voucher specimen. Copies of rare plant occurrence forms should be sent to the Saskatchewan Conservation Data Centre. Make sure that the collection number and name of the Herbarium where any rare plants were deposited is on the rare plant occurrence form; SCDC receives regular database updates from the Herbaria and the collection number is needed for cross-referencing data. If a voucher specimen was not obtained, copies of the photographs and morphological data collected should be sent to the Herbarium and the SCDC. Without good documentation regarding the identity of the plant, the rare plant occurrence form is of little use.

By reporting rare plant occurrences, all users of the SCDC benefit. The more information there is about rare plants, the better our understanding of their habitats and distribution. Rare plant occurrence information may contribute to the removal of rare plants from the SCDC list. Unless maintenance of project or client privacy is essential, all rare plant findings should be reported to the SCDC. Anyone who uses the W.P. Fraser Herbarium or the Conservation Data Centre has a responsibility to contribute to it.

Write survey report

The survey report should include a brief description of the project and the vegetation, survey results, photographs, time spent surveying, a map showing any rare plant populations and copies of any rare plant occurrence forms. Mitigation suggestions should be made if any rare plants would be impacted by the proposed project. The name and qualifications of the rare plant surveyor should also be recorded in the report.

CONTACT ADDRESSES

Native Plant Society of Saskatchewan
P.O. Box 21099
Saskatoon, Saskatchewan S7H 5N9
Phone: 306- 668-3940.
E-mail: info@npss.sk.ca

Saskatchewan Conservation Data Centre
3211 Albert Street
Regina, Saskatchewan, S4S 5W6
Fax: 306-787-1349 or 306-787-7085.

Information Manager
Phone: 306-787-7196

E-mail: jkeith@unibase.com

Botanist
Phone: 306-787-7198
E-mail: sheila.lamont.erm@govmail.gov.sk.ca

Web page: http://www.biodiversity.sk.ca.

W.P. Fraser Herbarium
College of Agriculture, University of Saskatchewan
51 Campus Drive, Saskatoon, Saskatchewan S7N 5A8
Phone: 306-966-4968. Fax: 306-966-5015
E-mail: ryanm@duke.usask.ca.

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