Fish & Wildlife Division

SPECIES AT RISK

Adopt-a-Plant Alberta: A Volunteer-based Conservation Initiative for Rare Plants and Lichens

Program Summary 2005–2008

Alberta Species at Risk Report No. 134

Government of Alberta

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Kelley J. Kissner

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EXECUTIVE SUMMARY

The Adopt-a-Plant Alberta (APA) program was initiated in 2005 to help address the shortage of information on population size and occurrence of most rare plants and lichens in Alberta. This information is needed to carry out provincial detailed status assessments of species. The idea behind the program was to train volunteer plant enthusiasts, "citizen scientists", from across the province to collect this information by searching for new locations and monitoring known sites of potentially at-risk plants and lichens. The program was designed to provide the training and support services needed to facilitate the collection of standardized data on rare plants by volunteers. Data collected are submitted to the Alberta Natural Heritage Information Centre (ANHIC) database, the primary provincial repository for information on native plants in Alberta. These data are available to researchers, resource managers, industry and other land users for species status assessments, habitat protection initiatives, and for land use development planning.

The scope and capacity of the program have expanded since its first field season in 2006. Initially APA worked only within parks and protected areas, but now accesses provincial Crown Lands and lands owned by Nature Conservancy of Canada (NCC). The program also contributes to recovery actions for provincially or federally designated at-risk species through education and awareness, carrying out surveys and monitoring, and helping with habitat improvement activities. The program has fostered relationships with other organizations interested in conservation of plants. These collaborations enhance APA's ability to contribute to conservation of native plants and lichens across the province, and enhance volunteers' knowledge and experience.

Adopt-a-Plant Alberta has been successful in acquiring funds and in-kind contributions to support three field seasons of work between 2005 and 2008. In any given year, approximately 50 to 70% of its operating costs have been generously covered by in-kind contributions from a variety of sources. Nearly 100 observations of rare plants have been collected by APA volunteers working on their adopted species. In addition, data have been collected on dozens of other rare species observed during group events and APA has participated in several conservation and recovery initiatives for at-risk species, including western spiderwort, western blue flag, tiny cryptanthe, small-flowered sand verbena, whitebark pine and limber pine. Adopt-a-Plant Alberta was awarded Volunteer Steward of the Year (2007) by NCC (Alberta Region) for its participation in plant surveys along the Milk River Ridge in 2007.

After three field seasons of operation, APA has met most of it objectives by recruiting a dedicated group of volunteers and professional botanists to provide instruction, participating in recovery efforts for at-risk plants and other conservation initiatives for rare plants, and enhancing a stewardship ethic in its volunteers. The program has not yet met its objective to collect enough data on several species to allow them to enter the provincial detailed status assessment process. However, the program has responded by reducing number of target species and focusing volunteer efforts on those for data collection, which should facilitate one or more of these species undergoing status evaluation in the next few years.

ACKNOWLEDGEMENTS

Adopt-a-Plant Alberta Founding Agencies:
Alberta Native Plant Council; Alberta Tourism, Parks and Recreation (Alberta Natural Heritage Information Centre); Alberta Sustainable Resource Development (Fish and Wildlife Division); Devonian Botanic Garden; and an independent lichenologist (Janet Marsh).

Adopt-a-Plant Alberta Steering Committee Members and Treasurer, 2005-2008:
René Belland, Myrka Hall-Beyer (Treasurer), Dana Bush, Jennifer Doubt, Joyce Gould, Coral Grove, Robin Gutsell, Roxanne Hastings, Ed Karpuk, Todd Kemper, Janet Marsh, Lisa Matthias.

Adopt-a-Plant Alberta Volunteer/Program Coordinator:
Robert Rogers (2006), Kelley Kissner (2007-2008)

Contributing Agencies, Organizations and Partners (2005-2008):
Alberta Ecotrust; Alberta Lottery Fund; Alberta Native Plant Council; Alberta Sport, Recreation, Parks and Wilderness Foundation; Alberta Sustainable Resource Development (Fish and Wildlife Division); Alberta Tourism, Parks and Recreation (Parks Division; Alberta Natural Heritage Information Centre); AXYS Environmental Consulting Ltd. (now Stantec); Calgary Zoological Society; City of Edmonton; Coyote Coulee Seeds; Devonian Botanic Garden; Environment Canada (Canadian Wildlife Service); Enviroscapes; Federation of Alberta Naturalists; Grasslands Naturalists; Government of Canada Habitat Stewardship Program; Nature Conservancy of Canada; Northern Forestry Centre; Parks Canada; Royal Alberta Museum; Shell Canada; TD Friends of the Environment Foundation; TERA Environmental Consulting; University of Alberta; University of Calgary; University of Lethbridge.

Between 2005 and 2008, Adopt-a-Plant Alberta was supported by an enthusiastic group of volunteers who donated their time, skills and energy to help conserve rare plants and lichens in Alberta, numerous professionals who provided logistical support to operate the program, and numerous resource managers, leaseholders, landowners, and members of the public who provided support to volunteers in the field and/or allowed them access to their lands. Thank you to the following individuals and all others who contributed to the development and operation of the program between 2005 and 2008: Keith Ainsley, Lorna Allen, René Belland, Danica Belter, Darren Bender, Rose Bendfeld, Heide Blakely, Elke Blodgett, Cheryl Bradley, Paulina Brudnicki, Lawrence Bouchard, Christine Boulton, Dave Burkhart, Dana Bush, Richard Caners, Melody Charlton, Donna Cherniawsky, Colleen Cole, Susan Conners, Patsy Cotterill, Dave Critchley, Joanne David, Nick DeCarlo, Mari Decker, Marie Decker, Heather Dempsey, Alison Dinwoodie, Alan Dodd, Jennifer Doubt, Brandy Downey, Catrina Duffy, Mae Elsiinger, Jana Erickson, Reg Ernst, Tracey Etwell, Dorothy Fabijan, Libby Fairweather, Rosemarie Ferjuc, Donna Fleury, Shaye Folk-Blagbrough, Barb Ford, Eileen Ford, Kristen Foreman, Jarrod Fuhr, Cheryl Fujikawa, Corlaine Gardner, Rob Gardner, Marilyn Germaine, Carmen Gibbs, Karen Gill, Sylvia Glass, Joanne Golden, Elaine Gordon, Joyce Gould,

Robert Grey, Graham Griffiths, Renny Grilz, Coral Grove, Krista Gummer, Robin Gutsell, Ian Hakes, Myrka-Hall Beyer, Aria Hahn, Kari Hamilton, Laurie Hamilton, Jeff Hartley, Roxanne Hastings, Marsha Hayward, Darcy Henderson, Samantha Hines-Clark, Bob Holland, Gail Hughes, Derek Johnson, Paul Jones, Ed Karpuk, Todd Kemper, Linda Kershaw, Stephanie Kurulok, Jane Lancaster, Cathy Linowski, Ron Linowski, Tom Maccagno, Chrissy MacInnes, Nora Manners, Patricia Marlowe, Janet Marsh, Craig Marshall, Gerry Matthews, Lisa Matthias, Tracey Mattock-Wallbank, Stephanie May, Sandy McAndrews, Hugh McDonald, Sharon McGonigal, David McIntyre, Patricia McIsaac, Amy McLenaghan, Evelien Meyer, Leslie Monteleone, Marilou Montemayor, Martha Munz Gue, Elaine Nepstad, Candace Neufeld, Anelita Newby, Glen Newby, Joel Nicholson, Kelly Ostermann, Don Page, Rania Page, Sue Peters, Vern Peters, Andrew Pickup, Elizabeth Podgurny, Kathryn Podgurny, Richard Quinlan, Marg Ramsay, Jeremy Reid, Bruce Reiger, John Rintoul, Laura Roberts, Trish Roberts, David Sauchyn, Glen Semenchuk, Ed and Linda Sholte, Sam Skinner, Bonnie Smith, Cyndi Smith, Rachel So, Dayle Soppet, Tina Sun, Joanne Susut, Stephen Symes, Kara Tersen, Cheryl Thorpe, Ashley Thorsen, Malgosia Turton, Mary Vetter, Suzanne Visser, Ksenija Vujnovic, Jim Wallbank, Kristie Wegener, Audrey Wells, Gustave Yaki, Richard Zaidan.

Photographs used in this report were taken by Darren Bender (photographs 6, 8, 9, 15), Richard Caners (photograph 11), Joyce Gould (photograph 12), Ed Karpuk (photograph 5), Kelley Kissner (photographs 1, 4, 7, 13, 14), and Lisa Matthias (photographs 2, 3, 10).

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1.0 INTRODUCTION

1.1 Background

Alberta's rich natural diversity is under pressure from human activities such as oil and gas development, agriculture and urban expansion. Over 800 species of plants and nearly 500 species of lichens are considered to be rare or of conservation concern for other reasons in Alberta according to the Alberta Natural Heritage Information Centre (Kemper 2009; T. Kemper, pers. comm.). Approximately, 15% (272/1868) of Alberta's vascular plants are ranked as May Be at Risk of extinction or extirpation in *The General Status of Alberta Wild Species 2005* (Alberta Sustainable Resource Development 2005). In comparison, only 3% of Alberta's vertebrate animals (17/584) are ranked as May Be at Risk. Species ranked as May Be at Risk become candidates to undergo a detailed status assessment (Figure 1), which uses population data to determine whether a species is at risk and should be legally protected as an Endangered or Threatened species. Although native plants may be of particular conservation concern in Alberta, the formal status assessment process is complicated for plants due to the large number of species requiring evaluation, and the fact that most species lack adequate population data for detailed status evaluation. Until adequate data are available, plant species that are potentially Endangered or Threatened will receive little or no conservation management. At the time of this report, only nine plant species had undergone a detailed status assessment in Alberta; seven are Endangered or Threatened, one is a Species of Special Concern, and one is Data Deficient. Several additional plant species that occur in Alberta have been assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and listed under the federal *Species at Risk Act* (SARA).

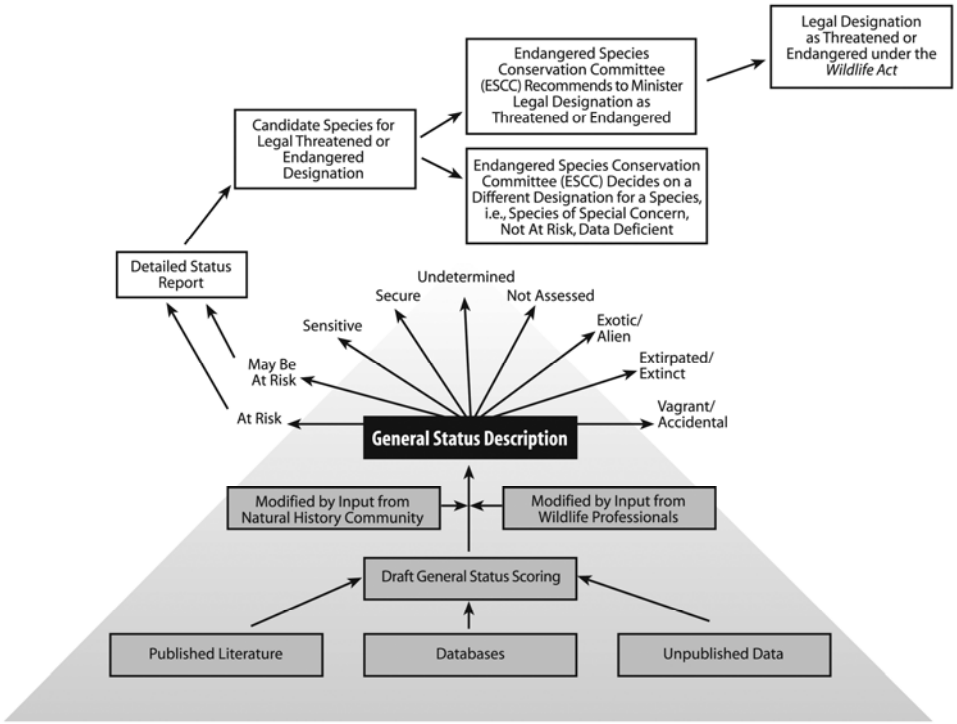

Figure 1. Process used to assess the status of species in Alberta. Diagram from *The General Status of Alberta Wild Species 2005* (ASRD 2005).

The Adopt-a-Plant Alberta (APA) program was initiated in 2005 to help address the shortage of information pertaining to most rare vascular plants, bryophytes and lichens (hereafter 'plants') to allow these species to enter the formal provincial status assessment process. The idea behind the program is to train volunteer plant enthusiasts, 'citizen scientists', from across the province to collect this information by searching for new locations and monitoring known sites of potentially at-risk plants. Adopt-a-Plant Alberta is designed to provide the training and support services needed to facilitate the collection of standardized data on rare plants by citizen scientists. This program is intended to be a cost-effective way to address the data needs of a number of potentially at-risk plant species, and at the same time, promote education and awareness of species at risk and biodiversity conservation.

Data collected by APA volunteers are submitted to the Alberta Natural Heritage Information Centre (ANHIC) database (maintained and operated by Alberta Parks), which tracks information on the conservation status of plants in Alberta. Once here, these data are available to researchers, resource managers, industry and other land users for activities such as status assessments, habitat protection initiatives, and for land use planning so that these locations can be conserved. As example of how often data on rare species is requested, ANHIC has received, on average, over 6,000 requests annually since 2005 for occurrence data on rare plants, animals and communities (T. Kemper, pers. comm.).

The scope and capacity of APA have evolved in several ways since its inception. Most significantly, the program's original focus on inventory and data collection for potentially at-risk plants has expanded to include habitat stewardship and inventory projects for provincially or federally designated at-risk (Endangered or Threatened) plants in the province. Adopt-a-Plant Alberta now integrates with ongoing recovery initiatives for these species through education and awareness, providing survey and monitoring support, promoting stewardship and contributing directly to stewardship and management activities. The program has also expanded its geographic scope; initially program volunteers conducted surveys only within parks and protected areas within Alberta given minimal access limitations to these areas. Since 2007, the program also works on lands owned by the Nature Conservancy of Canada (NCC) and, since 2008, on provincial Crown Lands. Occasionally, program volunteers also access private lands when permitted by landowners. The program also now collaborates with other conservation programs to undertake rare plant conservation or habitat stewardship initiatives (see Section 1.3). Overall, these collaborations enhance APA's ability to contribute to the conservation of native plants across the province.

1.2 Goal and Objectives

The goal of APA is to engage and train volunteer plant enthusiasts, 'citizen scientists', to search for, monitor, and carry out stewardship activities related to rare and at-risk plant and lichen species in Alberta and, in-so-doing to provide data for conservation and legal status assessments, and to support species recovery efforts.

Program objectives include the following:

- Engage a dedicated group of volunteers interested in native plant conservation, and strive to recruit increasing numbers of returning volunteers over the first few years of program implementation.
- Engage professional botanists, academics and resource managers with expertise in native plant conservation in the training of volunteers.
- Increase volunteers' technical skills and understanding of rare plant surveys, monitoring, and conservation, through instruction from professional botanists, academics and resource managers.
- Submit new data for rare species each year to the ANHIC database, which tracks information on rare plants in Alberta.
- Collect adequate data over three to five years of program implementation to allow for commissioning of detailed status reports for at least four target species.
- Contribute to conservation or stewardship initiatives through volunteer participation, leading to protection of species and/or stewardship of native habitats in Alberta.
- Contribute to provincial recovery programs for Threatened and Endangered plant species, through volunteer participation in surveys, monitoring, and other stewardship or conservation activities where volunteer support may be required.
- Foster an enhanced stewardship ethic in our volunteers, which they can promote in their own communities in Alberta.
- Report regularly on program activities to provide an account of work undertaken by APA and its volunteers, acknowledge support of volunteers and various agencies and organizations, and to allow for an evaluation of how the program is meeting its goals and objectives.

1.3 Organizational Structure

Administration

Adopt-a-Plant Alberta was founded by members from the primary provincial organizations involved with rare plant and species at risk conservation: Alberta Native Plant Council (ANPC), Alberta Parks Division/ANHIC (Alberta Tourism, Parks and Recreation), Alberta Fish and Wildlife Division (Alberta Sustainable Resource Development), and Devonian Botanic Garden (University of Alberta). Representatives

from these agencies, as well as an independent lichenologist, together formed the first Steering Committee for the program. The role of the Steering Committee is to direct the program, oversee its activities and ensure it is working to meet its goals and objectives. Individual membership on the Steering Committee has changed since the program began, but all founding member agencies continue to support and direct the program. The Steering Committee meets throughout the year to lead program development and implementation, including everything from planning events, reviewing the program's work and budget, and providing direction to a part-time Program Coordinator.

The program is partly administered by the ANPC. Program funds and spending are monitored by the Treasurer of the ANPC and APA provides quarterly reports of its activites to ANPC. The ANPC is one of 33 chartered clubs of the Federation of Alberta Naturalists (FAN), which is a registered charitable organization. As a result of ANPC's relationship with FAN and its charitible status, APA operates as a non-profit program. Between 2006 and 2008, the Steering Committee included a representative from FAN.

Daily Operation

In 2006, a part-time Volunteer Coordinator was hired to communicate with and provide support to volunteers. In 2007, this position was expanded into a part-time Program Coordinator, responsible for all facets of program management in addition to volunteer support services, including: fundraising and reporting to granting agencies, budget creation and management, planning and coordinating training workshops and field activities, and liasing with external agencies and organizations. The Program Coordinator works closely with the Steering Committee to ensure the program is meeting its goal and objectives. This position is the only ongoing, funded position of the APA program. Occasionally, other contractors are hired to undertake specific work associated with the program, such as writing reports.

Partnerships

Since its inception, APA has fostered and expanded partnerships with both government agencies and non-government organizations that have enhanced APA's ability to contribute to the conservation of native plants across Alberta.

In 2007, APA and NCC entered into an ongoing, mutually-beneficial collaboration whereby APA volunteers were provided access to over 40 of NCC's fully-owned properties to undertake rare plant surveys and survey data were provided to NCC to help steward these properties. Adopt-a-Plant Alberta has also partnered with NCC and other conservation programs (e.g., Grassland Naturalists) to offer field events of mutual interest. These events have provided additional opportunities to train volunteers in rare plant identification and survey efforts, to enhance volunteers' knowledge about rare plant conservation and habitat stewardship, and to pool resources (volunteers and funds) to undertake monitoring and habitat stewardship initiatives.

Adopt-a-Plant Alberta's involvement with species at risk conservation has been facilitated through ongoing planning with resource managers from the Government of Alberta (Fish and Wildlife Division) and Environment Canada (Canadian Wildlife Service), and through ongoing collaborations with species at risk conservation programs such as MULTISAR. These agencies and programs identified conservation and recovery activities that were suited to involvement by APA volunteers. Typically, these activities were recovery actions specified in recovery plans and included surveys, monitoring work and habitat improvements/stewardship (e.g., invasive weed removal) (See Section 3.4).

2.0 METHODS

2.1 Initial Program Planning

In 2005, to gauge interest in the development of the APA program and potential for involvement by volunteers, advertisements were put on ANPC's website and in their newsletter, *Iris*, asking interested individuals to contact program organizers. Based on an enthusiastic response to these advertisements, program development proceeded in 2005 with plans for the first volunteer training workshops and surveys by volunteers to occur in 2006. Additionally in 2005, the program's organizing committee sponsored a contest to design a logo that would represent the program. The winning entry by Jennifer Doubt was reworked by Brad Morris (www.bradmorris.ca) to its present form (see report cover). Another key step in early planning was to determine what species would be targeted by the program to generate a meaningful amount of data.

2.2 Species Prioritization

Adopt-a-Plant Alberta is unique in that it focuses on the collection of data on vascular plants, non-vascular plants and lichens. In 2005, a contractor was hired to develop a method to prioritize rare species of vascular plants, bryophytes and lichens that the program would follow to focus data collection by volunteers (Table 1). Federally and provincially listed plants were added to the list of target species generated. The prioritization method used several criteria to assign priority to species including the following: species ranking (ANHIC subnational conservation status rank, global rank, and provincial General Status rank), certainty of species identification, date of last observation, precision of geographic location data, and ease of travel to locate (initially, proximity to Edmonton and Calgary). This set of criteria was applied to all May Be at Risk plants (ASRD 2005) and to all rare plants and lichens tracked by ANHIC (ANHIC 2002; Gould 2006) to generate a list of potential priority species for the first field season in 2006 (Appendix 1).

Table 1. Criteria used to determine a priority list of rare species to focus data collection by Adopt-a-Plant Alberta volunteers.

Criteria	Score
Species Rank[1]	
Subnational (Alberta) Rank : S1, S2, S1S2, S2S3	2
Subnational (Alberta) Rank: S3	1
Global Rank: G1, G2, G2G4	2
Global Rank: G3, G3G5	1
May Be at Risk (for vascular plants only)	2
Watch List, Sensitive, S4, S5, G4, G5	0
Status undetermined, Exotic, Crustose Lichens	0
Species ID certain (ANHIC database)	
Yes	1
No	0
Last observation date (ANHIC database)	
2000-2006	2
1990-1999	1
<1989	0
Precision of mapping code (ANHIC database)	
S (generally within 250 m of location on occurrence record)	2
M (generally within 2.5 km of location on occurrence record)	1
G (generally within 8 km of location on occurrence record)	0
Accessibility(in reference to locations in ANHIC database)	
Within a 2-3 hour drive from Edmonton-Calgary corridor	2
1-day drive and overnight	1
Not easily accessible by car	0

[1]Species rank: see ANHIC (2002), ASRD (2005), and Gould (2006).

In 2007 and 2008, APA identified target species using some of these criteria, namely species rank (rarity), but also included criteria such as ease of identification, volunteer interest in particular rare species, and species geographic proximity to volunteers' locations (area of residence) within Alberta (Appendix 1). In addition, in 2008, the program targeted several species as highest priority for surveys to attempt to maximize survey effort and data collection. These species were identified by provincial botanists and species specialists as having nearly adequate survey data to allow them to enter the status review process (i.e., preparation of a species status report), or requiring data to allow status ranking (for *Ramalina*). Five species were chosen: three vascular plants (*Dryopteris cristata*, *Oxytropis lagopus* and *Polygala paucifolia*), one bryophyte (*Entodon schleicheri*) and one lichen (*Ramalina sinensis*).

2.3 Volunteer Recruitment

Adopt-a-Plant Alberta used a variety of methods to recruit volunteers and increase awareness of the program across the province. Since 2005, a mailing list of APA members and other interested individuals has been maintained, and these individuals were contacted each spring to alert them of upcoming program activities for the new field season (e.g., volunteer training workshops). In addition, APA published articles or announcements in natural history publications, such as *Iris* (ANPC), *NatureAlberta* (Federation of Alberta Naturalists), and the *Wildlands Advocate* (Alberta Wilderness Association). Contact was also made with ANPC members and other naturalist groups that had similar interests, so that they could advertise the program to their members at meetings, through their own mailing lists, or in their newsletters. Program pamphlets and posters were developed in 2007 to provide information on APA and its activities, and these were distributed to a variety of individuals and organizations. Whenever possible, presentations were given on APA's activities to supporting agencies and organizations at meetings and conferences (e.g., ANPC Annual General Meeting, university botany classes). In addition, APA hosted a display at the Annual General Meetings of ANPC in 2005 to 2008, to provide information on APA and its activities and to provide an opportunity for members to register to take part in APA. Finally, the program has maintained a website (www.ab.adoptaplant.ca) that helps advertise the program, in addition to being an information source and discussion venue for volunteers (see Section 2.9).

2.4 Technical Training for Volunteers

Each spring, APA program activities began with volunteer training workshops held in two locations in Alberta. Workshops were held in central and southern Alberta to allow individuals from across the province to participate with minimal travel. Past locations have included Edmonton, Lethbridge and Calgary. At the workshops, professional botanists, academics and resource managers donated their time and skills to train volunteers in rare plant identification (see Appendix 2), plant survey methods, standardized data collection methods, plant collection guidelines, use of Global Positioning Systems (GPS units), mapping and field safety. These topics were covered using a combination of classroom instruction and practical activities. Volunteers were provided with an information package containing topics from species-specific reference information to safety tips, which they could reference throughout the field season (also see Section 2.9). Much of the information provided in the information package was also hosted on APA's website. In 2007, a digital ('live') tutorial on mapping and use of a GPS was developed by Dr. Myrka Hall-Beyer (University of Calgary) for APA. This tutorial was made accessible to volunteers through the APA website.

At the workshops, volunteers were encouraged to 'adopt' one or more priority species on which to focus their survey efforts during the field season. Adoption of a species involved searching for new populations in suitable habitat in the province and/or monitoring the species at locations where it had been documented previously. Both types of data are valuable: documenting the species at new locations enhances information on

population size and distribution, and documenting the species at previously known locations provides population trend data, and confirms whether or not the species is persisting at the location.

In addition to (or instead of) working independently on priority species during the summer, volunteers were also provided with unique opportunities to participate in group events, including workshops to promote education and awareness of rare and at-risk species, monitoring work on rare and at-risk species, and habitat stewardship activities. These events were typically led by professional botanists, biologists and/or species specialists, and provided opportunities for additional practical instruction by professionals on plant identification, field survey methods and data collection protocols (See Section 2.7).

Photograph 1. Participants at an Adopt-a-Plant Alberta training workshop in Calgary, Alberta, 2007.

Photograph 2. Participants at a volunteer training workshop in Devon, Alberta, 2008. Volunteers were being coached on identification of rare plant species using herbarium specimens, photographs, maps and other information.

2.5 Volunteer Data Collection

Research and Collection Permits

Adopt-a-Plant Alberta works on lands administered by various government agencies, which required the program to obtain permits to access these areas for the purposes of conducting research. In some cases, permits held by the program also allowed for collection of plants (parts of or a whole specimen) that may be necessary to verify volunteers' observations (see Specimen Disposition below). Program volunteers were not permitted to collect species that were listed provincially or federally as species at risk.

Beginning in 2007, NCC provided APA volunteers access to their fully-owned properties, providing they informed NCC's volunteer coordinator and/or the designated land stewards prior to their survey. Program volunteers generally have not worked on other privately-owned lands within Alberta, except for group field trips where special permission was granted. Volunteers who wished to access privately-owned lands on their own must first have received written permission by the landowner and discussed access with the Program Coordinator before doing so.

In addition to formal permits, APA volunteers were generally requested to inform the Program Coordinator of their activities prior to conducting their work. The coordinator faciliated access to their field locations by informing land administrators of a volunteer's

intent to survey a particular area. This process helped ensure that conflicts did not arise and that various landholders were aware of the program and of the work being conducted in their area. This process also helped to identify access concerns (e.g., dirt roads only, 4-wheel drive access only) or other potential safety concerns (e.g., bears in the area) used in planning surveys.

Standardized Data Collection

Volunteers gathered data following protocols set out by resource managers, recovery teams, or in published guidelines to ensure that data were collected in a standardized manner and provided information critical to advancing knowledge on the species. Guidelines included the ANPC's "Guidelines for Rare Plant Surveys in Alberta" (ANPC 2000), and volunteers recorded data by filling out a "Rare Plant Occurrence Form" provided by Alberta Parks/ANHIC (see Appendix 3). This form records information on the geographic location of the observed plant occurrence, the population size and extent of the population at the site, the area surveyed, habitat information including associated vegetation and geophysical information (slope, aspect, etc.), and any potential threats to the location. Volunteers were encouraged to submit additional information that might help document the occurrence and their survey area including GPS track logs that record the path followed by the surveyor during their survey, sketched maps of the site, and photographs of the species (including identifying characteristics), the surrounding habitat, and identifying features/landmarks that would aid in relocation or verification of the record. Volunteers submitted their data to the Program Coordinator who collated data from all volunteers prior to submitting them to the ANHIC database.

Specimen disposition

Volunteers were encouraged to provide information necessary to verify their observations, particularly for volunteers with little previous experience identifying rare plants or volunteers adopting species that could easily be confused with similar-looking or related species. Volunteers were instructed to provide photographs of each observed rare species and its identifying characteristics, and/or to collect a specimen (whole plant) or identifying feature (e.g., part of a flower or seed pod, etc.). Given that APA focuses on species that are considered rare (and thus limited in population size and/or extent), APA emphasized collection of photographic evidence as the primary means of verification. Volunteers wanting to collect specimens were requested to follow ANPC's collection guidelines on how many individuals may be collected based on the observed population size (ANPC 2006, generally only one individual for every 50 individuals observed, otherwise only an identifying feature/part). Volunteers were taught at workshops how to properly press their collected specimens for long-term preservation and so that the most identifiable characteristics of the species are illustrated by the pressed specimen. The program engaged professional botanists and species specialists to donate their time to verify collected specimens and photographs. Once verified, specimens were submitted to herbariums for curation into their collections; vascular plant specimens were submitted to the University of Alberta, bryophytes to Devonian Botanic

Garden, and lichens to the Royal Alberta Museum. Digital copies of all photographs were submitted to Alberta Parks/ANHIC for long-term storage.

Photograph 3. Dorothy Fabijan, Assistant Curator of the University of Alberta Vascular Plant Herbarium, training volunteers on how to press plant specimens.

2.6 Safety

Safety of volunteers is a primary concern for APA, particularly because volunteers often work alone when accessing field sites and conducting surveys. Training workshops involved a discussion of potential dangers that volunteers could encounter during their work, how to avoid these dangers, what types of safety equipment to carry with them, and who to contact should an incident occur. Volunteers were encouraged to work together, whenever possible, and to inform the Program Coordinator (or another person) of their planned activities, including the date and time of their trip (and expected return), their planned travel route, and geographic location. The program provided volunteers with wallet-sized identification cards and small placards to place in their vehicle windows. Vehicle placards served to identify that a volunteer was working in an area and provided

program contact information should anyone have needed to contact the program for any reason.

2.7 Conservation and Stewardship

In 2007 and 2008, the program hosted or co-hosted with its partners several field events that brought together a large group of volunteers to undertake monitoring/survey work for specific rare or at-risk plants or to implement habitat improvements (e.g., invasive/exotic weed pull). These events typically involved an information and/or training component to enhance volunteers' knowledge about rare plant conservation and habitat stewardship and/or provide volunteers an opportunity to increase their identification and survey skills under the leadership of a professional botanist or resource manager. A summary of these events and partners involved is listed in Table 2 and details are provided in Section 3.4.

Table 2. Field events hosted by Adopt-a-Plant Alberta in 2007 and 2008.

Event	Location
2007	
Southern Alberta Rare Plant Workshop	Medicine Hat
Botany Alberta 2008	Milk River Ridge
Western Spiderwort Population Inventory	Pakowki Lake Sand Hills
Tiny Cryptanthe Survey	Medicine Hat
2008	
Botany Alberta 2008	Coyote Lake Nature Sanctuary
Whitebark & Limber Pine Workshop	Crowsnest Pass
W. Spiderwort Population Inventory & Habitat Stewardship	Pakowki Lake Sand Hills
Western Blue Flag Population Inventory	Southern Alberta
Tiny Cryptanthe & Small-flowered Sand Verbena Survey	North of Medicine Hat

2.8 Program Support

Fundraising and Administration of Program Funds

Each year a financial plan was developed to outline program costs and funding requirements. The preparation of funding applications to granting organizations and agencies was generally undertaken by the Program Coordinator, under the direction of the Steering Committee. The Steering Committee also made decisions on where to apply for funding, provided letters of support, reviewed funding applications, and helped write or review funding applications, when necessary.

Each year the program held several grants. Use of program funds was overseen by the Steering Committee and the Treasurer of ANPC. The Program Coordinator managed program funds on a daily basis, and prepared accounting reports to funding agencies and organizations.

In-kind Support

In addition to monetary support, the program relied heavily on in-kind support from numerous individuals, agencies and organizations. These contributions greatly reduced the funds (cash contributions) required to operate the program. By far the largest in-kind contribution came in the form of time donated by volunteers, both program volunteers who completed surveys, and professional academics, species specialists, and resource managers who trained volunteers or hosted field events, and some of whom directed the program as members on the Steering Committee (see Section 3.1). Other in-kind contributions included donated materials or equipment, and costs paid directly by other organizations to cover staff time (Program Coordinator) or to purchase equipment or supplies. The program was also supported by several herbariums that loaned preserved plant specimens for use in training volunteers.

In addition to time volunteers invested in the program, they also used their own vehicles to travel to and from field sites, paid for transportation costs (e.g., fuel), and occasionally incurred costs associated with overnight stays at field locations. However, in 2008 some funds were available to volunteers to cover a portion of their travel costs (see Section 3.1).

2.9 Volunteer Support

The Program Coordinator provided support, as needed, to volunteers throughout the field season and was the main contact for questions or equipment needs.

The program purchased equipment needed by volunteers to conduct fieldwork and this was loaned to volunteers during the field season. Equipment owned by the program includes handheld GPS units, paper and digital copies of Alberta topographic maps, plant presses, hand lenses, marking flags, and field/specimen bags. In 2008, APA purchased equipment needed by the Program Coordinator, including a laptop computer, printer, digital backup device, and digital camera.

In 2007, a program website was launched (www.ab.adoptaplant.ca). Program information and upcoming events were posted to the site to ensure that volunteers could easily access information about the program and resources relevant to their field work. The website included a members-only discussion forum that facilitated communication among volunteers across the province; individuals could post questions related to their work that could be answered by a botanist or by another volunteer. Costs associated with hosting and maintenance of this website were provided by the University of Calgary. In 2008, a public forum/group, ‘Adopt-a-Plant Alberta Volunteers’, was hosted via the internet, social networking tool Facebook. At the time of this report, this group had 18 members.

2.10 Volunteer Recognition

The program provided small annual gifts to volunteers who donated time to the program to recognize their efforts. Gifts for volunteers have included travel mugs and thermoses, native seed packets, and books. In 2008, volunteers were given program t-shirts both as a small token of recognition for their efforts, and to identify them as program volunteers when working in the field.

2.11 Volunteer Wrap-up Events

The program organized wrap-up events at the end of each field season to bring volunteers together in recognition of their efforts and to evaluate the work accomplished. As with volunteer training workshops, these events were held in two locations in the province (typically central and southern Alberta) to minimize travel. These gatherings included a special event such as a herbarium tour and presentation on the curation of herbarium specimens, a debriefing session where volunteers summarized their experiences during the summer, and an evaluation session where volunteers provided feedback, both verbal and/or in a survey format, on the program (Appendix 4). The feedback information was used by the Program Coordinator and Steering Committee to plan the following field season based on aspects of the program volunteers believed were successful or required improvement. At these wrap-up events, volunteers returned their data forms, collected specimens and loaned equipment.

Photograph 4. Adopt-a-Plant Alberta volunteers and Steering Committee members at a wrap-up event in Edmonton in 2008.

3.0 RESULTS

3.1 Financial and In-kind Support

Cash Contributions

Between 2005 and 2008, APA received funds from several sources to undertake program activities and administer the program. Individual cash contributions varied in value from approximately $500 to $33,000. The total value of cash contributions to APA between 2005 and 2008 was $153,388. Figure 2 shows the value of cash contributions by year. Note that in 2005 the program was in development, which accounts for the small contribution (funding needs) in that year.

Cash contributions received or expenses paid directly by sponsoring organizations between 2005 and 2008 included contributions by Alberta Ecotrust (2008), Alberta Lottery Fund (2008), Alberta Native Plant Council (2005), Alberta Sustainable Resource Development (Species at Risk Program, 2005 to 2008), Alberta Sport, Parks, Recreation and Wildlife Foundation (2006 and 2007), AXYS Environmental Consulting (2006), Government of Canada Habitat Stewardship Program (2006 to 2008), Shell Environmental Fund (2006), TD Friends of the Environment Foundation (2006), and TERA Environmental Consultants (2006). Contributions from the Habitat Stewardship Program and some funding provided by Alberta Sustainable Resource Development were specifically targeted to support work on provincially and federally listed at-risk plant species. Also of note, some funds acquired in 2008 were used to support a portion of volunteers' travel expenses; in previous years the entire cost of volunteers' travel was recorded as in-kind contributions to APA. These travel funds account for the larger cash contribution in 2008 compared to previous years (Figure 2). Even after receiving this subsidy for travel in 2008, APA volunteers still donated hundreds of hours of time to participate in field surveys and events (see Section 3.3), and any remaining travel costs not covered by the subsidy were also considered part of their in-kind contribution.

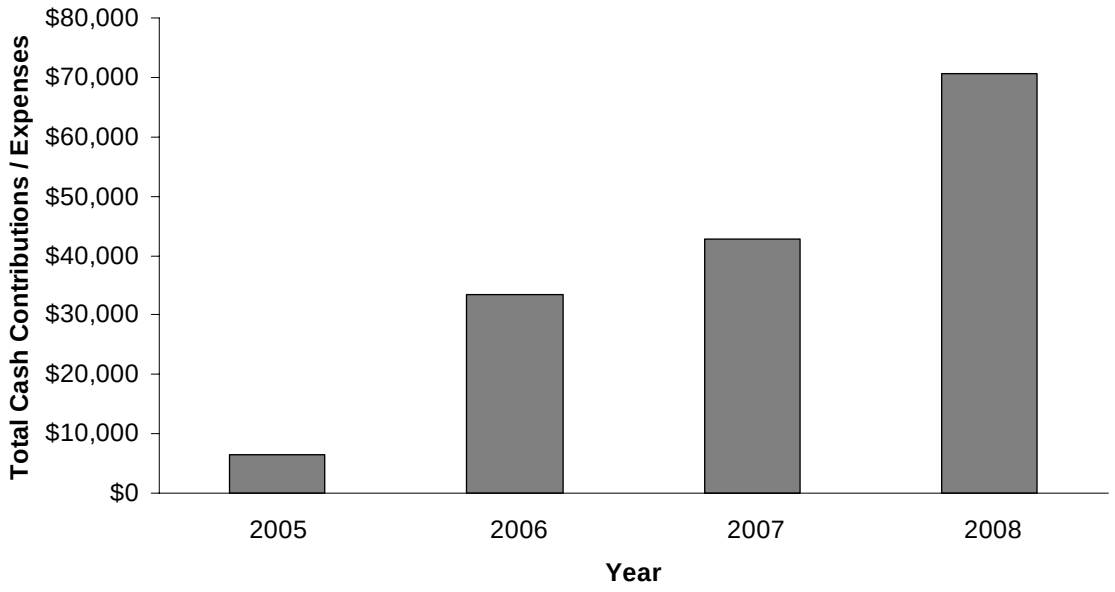

Figure 2. Total cash contributions to the Adopt-a-Plant Alberta program between 2006 and 2008. Note that in some years, small amounts of funds were carried over to the following fiscal year, when permissible.

In-kind Contributions

Substantial in-kind contributions of donated human resources (volunteers and professionals), materials and supplies, equipment, office space, printing and production services and other logistical support were received by the program each year. These contributions significantly reduced the amount of cash funds required by the program, allowing it to operate on a relatively small budget. The largest in-kind contribution was time donated by program volunteers to survey for rare plants and lichens, and the time and skills donated by professionals and agencies associated with training of program volunteers and through the Steering Committee (See Figure 3, Section 3.2). In-kind human resources were valued at $10/hour for APA volunteers and $35/hour for professionals.

Organizations and agencies providing in-kind support between 2005 and 2008 included Alberta Native Plant Council (2006 to 2008), Alberta Sustainable Resource Development (Fish and Wildlife Division 2005 to 2008), Alberta Tourism, Parks and Recreation (Alberta Natural Heritage Information Centre), Devonian Botanic Garden (2006 to 2008), Federation of Alberta Naturalists (2006 to 2008), Royal Alberta Museum (2007 and 2008). Much of this support represented human resources costs for members of the Steering Committee and other professionals involved in training volunteers during spring workshops or field events. In addition, the program received logistical and training support from various other organizations including Environment Canada, Northern Forestry Centre, University of Alberta, University of Calgary, and University of Lethbridge. Furthermore, numerous individual professional botanists and lichenologists

loaned their expertise and specimens from their personal collections for use in training sessions.

3.2 Program Operating Costs

This section provides details on the total cost of operating the program between 2006 and 2008. Note that here contributions and expenses are considered equally, since monies or in-kind contributions received by the program are spent in full to cover expenses incurred by the program. Also note that cash and in-kind contributions/expenses for 2005 when the APA program was in development are not included here. In that year, APA received and spent $6,500 on two contracts, including (1) to develop the protocol to rank species in order to prioritize species to target during the program (see Section 2.2), and another (2) to develop and submit grant proposals to fund the program's first field season in 2006. Professional time for members of the Steering Committee during program development and planning was not formally recorded by the program in 2005, but represented additional human resource contributions/expenses for APA that year.

During APA's first three field seasons (2006 to 2008), the total annual cost of operating the program was $117,530 in 2006, $146,083 in 2007 and $130,842 in 2008. In 2006 and 2007, more than 70% of these costs were covered by in-kind contributions, and in 2008 nearly 50% were covered by in-kind contributions, making the program low-cost to operate. The smaller contribution of in-kind resources in 2008 was largely due to APA receiving funds to reimburse a portion of volunteers' travel expenses; in previous years these expenses were considered in-kind contributions to APA.

Figure 3 shows cash and in-kind contributions/expenses for 2006 to 2008 inclusive by expense category. By far, the greatest contribution to APA has been in-kind human resources, which includes time and travel expenses donated by APA program volunteers to conduct fieldwork, time donated by professionals to train volunteers, and professional time for members of the Steering Committee to oversee the program.

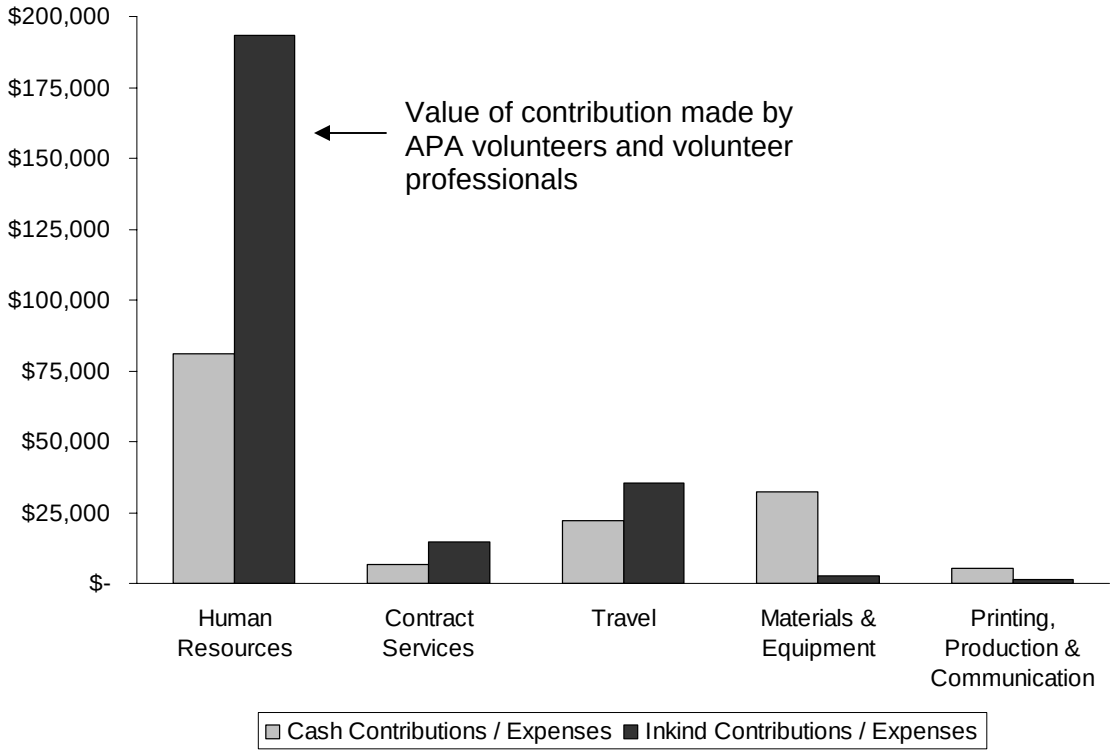

Figure 3. Adopt-a-Plant Alberta program expenses covered by cash and in-kind contributions between fiscal years 2006 and 2008 inclusive.

3.3 Volunteer Participation

The program has been enthusiastically supported by a large group of volunteers (program volunteers and volunteer professionals) since its first field season in 2006. Program volunteers have spanned the province, from as far north as Fort McMurray and as far south as Lethbridge. The background and experience of these individuals varied from professional botanists to individuals with little or no previous experience working in the field or collecting data on plants. Table 3 summarizes volunteer participation between 2006 and 2008, including number of volunteers, total hours and variation in hours donated by volunteers, and volunteer retention across years. Note that time donated by program volunteers includes time devoted to training, trip planning, travel to field sites, field surveys/activities, and time required to collate data and submit it to the program.

Table 3. Volunteer participation in the Adopt-a-Plant Alberta program between 2006 and 2008.

Year	2006	2007	2008
Professionals (Steering Committee and Training)	17	25	29
Total Professional Hours	1,794	1,427	1,049
Program Volunteers	33	42	43
Total Program Volunteer Hours*	903	2,060	1,447
Range in Hours by Individual Program Volunteers*	5-154	5-133	19-151
Returning Program Volunteers	n/a	44%	44%

*Based on volunteers reporting their volunteer hours to the Volunteer/Program Coordinator.

Table 3 shows that the number of program volunteers has increased modestly across years and that many of the same volunteers participate in the program each year. In 2008, nearly 30% of volunteers were individuals who had also participated in the first two field seasons.

The total number of hours donated by program volunteers has varied among years, and appears to be somewhat independent of the number of volunteers. Each year the amount of time donated by individual program volunteers varied greatly, with some volunteers donating a few hours to the program and others logging more than 150 hours. In terms of days donated to the program by individual volunteers (based on an 8 hour work day), this would account for a range in field days of less than 1 day to nearly 20 days.

3.4 Data Collection

Focal Species

The number of species prioritized by the program varied from 38 in 2006, 51 in 2007, and 21 in 2008. To help increase the amount of data collected on individual rare species, the program prioritized fewer species in 2008 than in earlier years and additionally encouraged volunteers to collect data on five species in particular (*Dryopteris cristata*, *Oxytropris lagopus*, *Polygala paucifolia*, *Entodon schleicheri* and *Ramalina sinensis*) that were identified as requiring modest amounts of data to allow them to enter the status review process in the next few years, or as requiring data to allow them to be ranked (for *Ramalina sinensis*).

Table 4 provides a summary of data on rare species collected by individuals working independently or in small groups. Although the number or records was modest in each year, the amount of data collected by APA volunteers on their adopted species has continued to increase per year (in addition to accumulating across years). This result, combined with high number of returning volunteers, may indicate that volunteers are becoming more skilled at identifying and surveying for rare species. Appendices 5, 6 and 7 provide details on the actual species recorded, the number of records collected for each,

and whether these records represented new locations for the species (not yet in ANHIC) or whether these were relocations of previous observations.

Table 4. Summary of rare plant data collected by Adopt-a-Plant Alberta volunteers working independently or in small groups. Shown are the total number of records collected, the number of these records that were new locations as opposed to relocations of previous observations, and the total number of species contained within these records. Note that a single record may represent a count of one or more plants at a location/survey area (e.g., a count of a large population); thus, the number of records does not equate to the actual number of plants observed/counted. See Appendices 5, 6, and 7 for details on individual species. Data includes only work done by individual volunteers (i.e., not APA-led group events).

Year	Total Records	# New Records	# Relocated Records	Total Species
2006	15	11	4	12
2007	28	13	15	16
2008	55	40	15	22
All years	98	64	34	38*

*Value is lower than the sum of yearly totals because some of the same species were observed in multiple years.

Data collected during field events are not included in Table 4. See details on field events and data collected during these events below.

Conservation and Stewardship Field Events

A variety of group events were hosted in 2007 and 2008 across Alberta. Below is a summary of work undertaken at each event.

Botany Alberta with the Alberta Native Plant Council and Nature Conservancy of Canada

Each spring, ANPC hosts Botany Alberta, an annual two-day event where expert botanists lead amateur botanists on a survey "blitz" of plants, with particular attention given to rare species. Since 2007, ANPC, APA and NCC have co-hosted this event at various NCC properties across Alberta. Plant species and plant communities are recorded during the annual two-day event and these data are used by NCC to help steward their properties. In addition, data on rare species observed during the event are also provided to ANHIC to help track occurrence, distribution and population sizes of these species in the province.

In 2007, Botany Alberta was held along the Milk River Ridge where a large amount of native grassland remains. Surveys occurred at three NCC properties and on a nearby

community pasture. Particular attention was given to surveying these areas for hare-footed locoweed (*Oxytropis lagopus*), a species designated as May Be at Risk in Alberta and a rare (S1) species tracked by ANHIC. This species was prioritized by APA in 2006 to 2008, and will continue to be a focal species for the program (L. Matthias, pers. comm.). Several new populations of this species were observed and counts were made to record their population sizes. In addition to data collected on *Oxytropis*, observations of many other rare species tracked by ANHIC were recorded during the event and were submitted to the database, including blue camas (*Camassia quamash*) (S2[*]), tufted hymenopappus (*Hymenopappus filifolius*) (S2), American thoroughwax (*Bupleurum americanum*) (S3), low yellow evening primrose (*Oenothera flava*) (S2), sticky purple geranium (*Geranium viscosissimum*) (ANHIC required further information), waterpod (*Ellisia nyctelea*) (S2), and western ribgrass (*Plantago canescens*) (S2) (Bradley and Marsh 2008).

In 2008, Botany Alberta was held at NCC's Coyote Lake Nature Sanctuary, located southwest of Edmonton. The Nature Sanctuary is located within the Greater Coyote Lake Conservation Area which encompasses 800 acres of land under stewardship by NCC, the province and private landowners. Rare species observed during the event included Back's sedge (*Carex backii*) (S2), lakeshore sedge (*C. lacustris*) (S2), stalked sedge (*C. pedunculata*) (S1), Robbins' pondweed (*Potamogeton robbinsii*) (S1), spotted coralroot (*Corallorhiza maculata*) (ANHIC required further information), grape ferns *Botrychium michiganense* (SU) and *B. pinnatum* (S1), golden saxifrage (*Chrysosplenium iowense*) (S3), a liverwort (*Riccia fluitans*) (S2) and a rare lichen (*Ramalina sinensis*) (SU) (Cotterill 2008).

[*] Ranks indicated for species follow Gould (2006) and ANHIC (2002), which were these species' ranks during APA's field activities between 2006 and 2008. These ranks may have since been updated.

Photograph 5. Volunteers photographing blue camas during Botany Alberta 2007 on the Milk River Ridge.

Photograph 6. Volunteers surveying for plants during Botany Alberta 2008 at Coyote Lake Nature Sanctuary.

Southern Alberta Rare Plant Workshop with the Grassland Naturalists

The Grassland Naturalists is a non-profit community group dedicated to the preservation and appreciation of the native grassland landscape of southeastern Alberta. In May 2007, APA and Grasslands Naturalists co-hosted a one-day rare plant workshop for volunteers from both programs to increase awareness of several listed plant species in southern Alberta, such as tiny cryptanthe (*Cryptanthe minima*), small-flowered sand verbena (*Tripterocalyx micranthus*), and western spiderwort (*Tradescantia occidentalis*). Participants were given instruction on how to identify these species, how to survey for them, and information on their conservation needs. The workshop provided an opportunity for members from both groups to discuss how they could work together in the future on these and other rare plants in southern Alberta.

Tiny Cryptanthe Survey with the Grasslands Naturalists and Environment Canada

In 2007, the Chair of the National Recovery Team for Plants at Risk in the Prairie Provinces (from Environment Canada) instructed volunteers from APA and the Grassland Naturalists at a one-day field event on how to identify and survey for tiny cryptanthe, an Endangered species. A survey was conducted at a site in Medicine Hat, and several patches of tiny cryptanthe (<5 m across) were located. The survey established an approximately 1 ha survey plot that will act as a reference plot for provincial and federal resource managers to monitor changes in population size at this location. Population trends of tiny cryptanthe are not well understood, so annual or semi-annual surveys conducted at this location will be important for tracking population size of this species. The Grassland Naturalists have since ‘adopted’ the area and have advocated for the conservation of this site and protection of this species.

Photograph 7. Volunteers surveying for tiny cryptanthe in a subdivision in Medicine Hat, Alberta, 2007.

Tiny Cryptanthe and Small-flowered Sand Verbena Field Event with the Grasslands Naturalists and Alberta Sustainable Resource Development

In 2008, APA hosted a one-day information workshop and field survey for its volunteers, members of the Grassland Naturalists and members of the Alberta Tiny Cryptanthe Recovery Team on tiny cryptanthe and small-flowered sand verbena, two provincially and federally listed species at risk. The purpose of the event was to instruct participants on how to identify these difficult to identify species, to discuss their biology and conservation needs, and to highlight potential threats to these species. Participants visited several locations where these species had been previously recorded and both species were observed at these locations. Following the field instruction, participants conducted a survey for these species in areas of suitable habitat; no new locations were observed.

Photograph 8. Small-flowered sand verbena.

Photograph 9. Tiny cryptanthe plant starting to senesce at the end of its growing season.

Western Spiderwort Population Monitoring and Habitat Stewardship with Alberta Sustainable Resource Development

In 2007 and 2008, APA supported ASRD in undertaking activities important to the conservation and recovery of western spiderwort, a provincially and federally listed species at risk. During these annual 2-3 day events, APA volunteers collected standardized data on occurrence and population sizes of this species at a total of 19 of 26 populations (patches) in the Pakowki Lake Sand Hills near Medicine Hat and began ongoing work to remove non-native invasive plant species (primarily baby's breath, *Gypsophila paniculata* L.) from western spiderwort habitat (18 plants were removed in 2008 from 3 sites). Both of these activities are denoted as recovery actions in the *Maintenance and Recovery Plan for Western Spiderwort in Alberta 2005-2010* (Alberta Western Spiderwort Recovery Team 2005).

In 2008, APA administered a contract to formally report on its involvement in western spiderwort conservation and habitat stewardship (Peters et al. 2009). This report provides details on the methods used by APA to survey patches and to remove baby's breath plants. It also details other noteworthy observations made by APA during this work, including observations of herbivore grazing on plants and potential pollinators of this species. Furthermore, the survey work conducted by APA allowed for an updated provincial population estimate for the species of 37,200 plants. This estimate is the largest ever recorded in Alberta (the previous estimate was 28,400 in 2005). Despite an increase in plant numbers, the species still appears to be restricted to an area of 2.2 km^2 in Alberta.

Adopt-a-Plant Alberta will continue to provide support to resource managers in recovery and conservation efforts for western spiderwort, including additional survey work, removal of invasive, exotic species, and evaluation of these removal activities.

Photograph 10. Western spiderwort in the Pakowki Lake Sand Hills.

Photograph 11. Adopt-a-Plant Alberta members starting to remove baby's breath plants from sites occupied by western spiderwort, 2007.

Western Blue Flag Population Inventory with the MULTISAR Program

In 2008, APA volunteers supported MULTISAR to conduct surveys of several western blue flag (*Iris missouriensis*) populations across southern Alberta, including sites around Cardston, Fort McLeod, Banff National Park and the City of Calgary. Western blue flag is a Species of Concern in Alberta (previously Threatened) and is Threatened in Canada. During surveys over several days, volunteers made counts of plants (stems) and flowering stems/seed pods. In addition, volunteers made several observations in 2008 (e.g., missing survey markers, etc.) that would serve to improve upon the survey methods used for the provincial survey of this species in 2009, for which APA volunteers had already volunteered to assist.

Photograph 12. Western blue flag.

Photograph 13. Western blue flag plants flagged by Adopt-a-Plant Alberta volunteers during a survey of a population in Calgary, Alberta, 2008.

Whitebark and Limber Pine Workshop with Nature Conservancy Canada and Parks Canada

In July 2008, a one-day field event was co-hosted with NCC in the Crowsnest Pass on limber pine and whitebark pine, two provincially Endangered species. The purpose of the event was to train volunteers from APA and NCC on how to identify the two pines species threatened by white pine blister rust (*Cronartium ribicola*), a spreading, exotic fungal pathogen, and increased presence of mountain pine beetle (*Dendroctonus ponderosae*). Volunteers were also trained on how to conduct a standardized health assessment of these species to assess infection by blister rust. Knowledge of where these pines occur and whether stands are infected (via the health assessment) helps provincial resource managers in their efforts to prevent the spread of this pathogen and conserve these pines.

Photograph 14. Adopt-a-Plant Alberta and Nature Conservancy of Canada volunteers at the whitebark pine and limber pine field event in the Crowsnest Pass, 2008.

3.5 Awards

In 2008, the Alberta Region of NCC awarded APA its 'Volunteer Steward of the Year' award for 2007. This award recognized APA's work to help identify and record observations of rare plants on NCC's properties on the Milk River Ridge during Botany Alberta in 2007, and the partnership fostered between APA and NCC. NCC has limited resources to conduct rare plant surveys on its properties and data collected during this event and others hosted on its properties will help NCC steward these properties. The award was presented to APA during NCC's Board Annual General Meeting in May 2008 and was presented once again to APA in the presence of many of its volunteers during Botany Alberta in 2008. The award was also announced to APA volunteers via an electronic mail announcement and on APA's Facebook site.

Photograph 15. Renny Grilz, Director of Conservation of the Nature Conservancy of Canada (Alberta Region) presenting Adopt-a-Plant Alberta with the Volunteer Steward of the Year award for 2007 at the Botany Alberta field trip in 2008.

3.6 Program Evaluation

Volunteers provide feedback on the program primarily via a program survey and/or verbal feedback via a round-table discussion at program wrap-up events. Feedback on the program has been largely positive, with volunteers indicating that they enjoyed taking part in the program and that the training provided was generally sufficient to allow them to conduct their work independently. Volunteers supported the provision of any tool (website, chat forum, Facebook, contact lists for members) that allowed them greater access to program materials or that enhanced communication among volunteers.

Items volunteers noted for improvement have included (1) the need for additional help in narrowing down appropriate survey areas for their adopted species, (2) a preference by volunteers for the program to better match focal species with their area of residence in the province to minimize travel distances, (3) a consistent source of funds to support volunteer travel, and (4) the need for more group events in northern Alberta to allow for greater participation by volunteers from this part of the province.

This feedback has guided the Program Coordinator and Steering Committee during planning for future field seasons. In response, species occurrence maps for focal species were developed to help narrow down potential survey areas and to help volunteers make decisions regarding the most convenient species to adopt based on the area of occurrence of focal species in relation to their own location in the province. In addition, the program

has planned to annually apply for funds to cover a portion of volunteers' travel costs and to try to organize additional field trips in the northern portion of the province.

4.0 DISCUSSION

Adopt-a-Plant Alberta has grown and evolved over its first three years of operation. The completion of three field seasons provides a good opportunity to evaluate whether APA is meeting its objectives. This evaluation of success in meeting program objectives is important to help guide the program in future years.

Engagement and retention of volunteers

The program has been very successful at attracting a dedicated group of volunteers annually, and has experienced modest increases in the number of volunteers across years. The program also has been successful in retaining many of its volunteers (>40% annually). Volunteer retention is an important measure of success for the program because it indicates that volunteers enjoy the program and feel committed to it. High volunteer retention also allows for the development of an increasingly well-trained core group of volunteers, which should enhance the amount and quality of data collected over the long-term.

Engagement of professionals in training activities

Professional botanists, species specialists, academics and resource managers have been overwhelmingly supportive of the program, graciously donating their expertise and skills to help train volunteers or lead field events. This support has been invaluable to the program in helping the program meet many of its other objectives, and these donations have allowed APA to operate on a relatively small budget.

Increase in volunteers' technical skills/knowledge via instruction from professionals

Involvement of professionals in training workshops and field events has helped ensure that volunteers were adequately prepared to conduct surveys independently, and has helped ensure a high-standard of data collection. Each year, several professionals also registered as program volunteers. The program benefited greatly from having more-experienced volunteers available to mentor less-experienced volunteers throughout the field season. Annual involvement by professionals combined with high volunteer retention allowed some volunteers with little or no initial experience to greatly improve their identification and survey skills relatively quickly.

Submission of data to ANHIC

Data collected by APA between 2006 and 2008 have been submitted to ANHIC for inclusion in its database. A moderate amount of data has been collected and APA continues to focus on implementing strategies to increase the amount of data collected.

Many of the records collected by APA were new locations of rare species, which has contributed valuable information on their distribution and occurrence in the province.

Collection of adequate data on at least four species over three to five years to allow for production of detailed status reports

No species targeted by APA in its first three field seasons has entered the status assessment process, which begins with the preparation of a detailed status report. Failure to meet this objective after three years is largely due to the relatively small amount of data collected on individual focal species during this time, though data have been collected across a fairly large target list of rare species. To help increase data collection, APA reduced its number of focal species in 2008 and, additionally, encouraged data collection on several specific focal species that resource managers identified as having nearly adequate survey data. These species should remain high-priority focal species for the program, in hopes that enough data may be collected in the next two years (five-year mark) to facilitate the production of detailed status reports.

Contribution to conservation or stewardship initiatives

Adopt-a-Plant Alberta has made significant contributions to conservation and stewardship initiatives. The data collected on rare plants by volunteers and submitted to ANHIC will be used to flag (and hopefully protect) locations of these rare species until their status can be evaluated. Adopt-a-Plant's partnership with organizations such as NCC has enhanced the program's ability to contribute directly to stewardship of native habitats across Alberta, and has enhanced APA volunteers' knowledge of the principles of habitat stewardship.

Contribution to provincial recovery programs for at risk plants

Adopt-a-Plant Alberta is ideally suited to assist recovery efforts for plant species at risk through the provision of a dedicated group of volunteers. In 2007 and 2008, Adopt-a-Plant Alberta made significant contributions to the recovery of western spiderwort, western blue flag, tiny cryptanthe, small-flowered sand verbena, limber pine and whitebark pine, through its involvement in seven field events. In particular, APA's involvement in undertaking monitoring work on western spiderwort and implementing habitat improvements (e.g., weed removal) should serve as an example of the types of recovery activities suited to involvement by APA volunteers. Recovery plans are currently in development for several plant species at risk, and APA will continue to explore opportunities to contribute to their recovery.

Foster an enhanced stewardship ethic in volunteers

It is difficult to evaluate whether APA has fostered an enhanced stewardship ethic in its volunteers. However, APA has succeeded in providing numerous opportunities for volunteers to learn about the value of conserving and stewarding Alberta's native

habitats, particularly through the program's colloborations with NCC, ASRD, and MULTISAR.

Report regularly on program activities

This report represents the first comprehensive report on APA's activities to date. As discussed earlier, a report on APA's involvement in monitoring and stewardship work for western spiderwort was produced recently (Peters et al. 2009). Regular program reporting (either annually or biennially) should be conducted to evaluate whether the program is on track and meeting all of its objectives, and to allow the program to change direction, as necessary.

Challenges and future strategies

APA has been successful in meeting most (8 of 9) of its objectives. However, the program has yet to collect a significant amount of data on any single rare species that would allow it to enter the status evaluation process (or move it considerably closer to entry into the process). This is a significant issue for APA since the initial idea behind the program was to engage volunteers to collect data on these potentially at-risk species so they could more quickly enter the status evaluation process.

Several factors have likely contributed to this result, such as number of volunteers, spread of volunteers across the province, number of priority species, and number and/or focus of group field events. Adopt-a-Plant Alberta has been successful in attracting a fairly large number of volunteers each year. However, not all volunteers who adopt species collect and submit data on them, either because they were not able to locate their species during surveys or they were unable to participate in the program or to the level of engagement they had anticipated. Also, volunteers are located across the province; as a result, volunteers' interest in particular rare species typically varies with geographic location. Volunteers were more likely to adopt species that occur fairly close to where volunteers live, or that occur in habitats that are familiar to them. Thus, although a large number of volunteers may take part in the program, the number of volunteers willing to conduct surveys on any one particular rare species may be small.

The number of species targeted by the program may also have impacted the amount of data collected on individual species. The higher the number of rare species prioritized by the program, the fewer the number of volunteers adopting the same species. In 2008, the program reduced the number of priority species in comparison to the numbers selected in 2006 and 2007, and particular focal species were also given higher priority that year. However, there was still a relatively large number of species to choose among in 2008 (n = 21) and the high-priority focal species did not necessarily occur in places that volunteers from across the province could quickly travel to. Consequently, there were still relatively few individuals adopting the same species.

The number and focus of field events may influence data collection. Only four or five field events (in addition to the workshops and wrap up events) can typically be

coordinated by the program each summer and these have almost entirely targeted species at risk, rather than species that have not yet been evaluated. This is largely because program funding can more easily be acquired for carrying out work on species at risk, but less so for as-yet-unlisted-but-rare plant species. Because field events provide an opportunity to collect a large amount of data on a single species in a relatively short period of time, more of these events need to target rare focal species in addition to species at risk.

To increase the amount of data collected on rare focal species, APA could consider several strategies.

- Attract a much larger number of volunteers to the program. However, inclusion of greater numbers of volunteers would increase the amount of funds required to coordinate and carry out the program.
- Choose priority species and preferentially advertise the program in areas that overlap the geographic ranges of the focal species. This may help ensure that there are adequate numbers of volunteers to collect data on these species.
- Further reduce the number of focal species. This would be possible but may decrease some volunteers' interest in the program if there are few species that interest them/occur where volunteers live.
- Volunteers could be provided with a clearer idea of where the program is heading in each field season and why the program is focusing on certain species that year.
    - Volunteers may be motivated to collect data on a species they might otherwise not be interested in adopting, if the program made them aware of "how close" a species might be to entering the status evaluation process and provided them with a target for data collection on that species, such as a target number of records to be collected that summer or a target number of hectares to survey.
    - In addition, the program could attempt to provide additional information to help volunteers focus their surveys as much as possible. For example, a map of suitable habitat for focal species and identification of priority areas to survey.
- Organize more events on rare but as-yet-unlisted focal species, as opposed to just those species that are already listed as Threatened or Endangered. However, the program would have to balance this approach so that it still meets its objectives related to species at risk and habitat stewardship.

Additional Challenges

- Finding a sustainable source of funding remains an ongoing challenge for APA.
    - Fortunately, APA has had large portions of its operating costs covered by in-kind contributions each year, reducing the amount of cash contributions needed to deliver the program.
- An increasing number of conservation and environmental programs in Alberta has meant that APA competes with other programs for volunteers and their time.

    - One solution has been to partner with other conservation programs to host events of mutual interest. These partnerships have also provided opportunities to share in the costs of these events.
- Along with regular reporting on program activities, the program needs to define and implement clearer measures of tracking its success over time, including measures of volunteer satisfaction and quantifying the amount of data collected during group field events.

Conclusions

Based on three field seasons of operation, APA has met most of it objectives: recruiting a dedicated group of volunteers and professionals willing to donate their expertise and skills to train volunteers, participating in recovery efforts for at-risk plants and other conservation initiatives for rare plants, and enhancing a stewardship ethic in volunteers.

Adopt-a-Plant has not yet met its objective to collect enough data on several species to allow them to undergo a detailed status assessment in Alberta. However, the program has implemented several changes over time to enhance data collection, and has identified several solutions to further enhance its ability to collect rare plant data in the future. These strategies should allow one or more of its focal species to undergo status evaluation in the next few years, and at the same time allow the program to continue to meet its other objectives.

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6.0 APPENDICES

Appendix 1. Priority plant species targeted by Adopt-a-Plant Alberta between 2006 and 2008.

Species	**2006**	**2007**	**2008**
Bryophytes			
Aloina brevirostris	X	X	
Aloina rigida		X	
Amblyodon dealbatus	X	X	
Bartramia halleriana		X	
Bartramia pomiformis		X	
Bryum porsildii		X	X
Callicladium haldanianum			X
Entodon schleicheri	X	X	X
Fontinalis antipyretica	X	X	
Leskea polycarpa	X		X
Seligeria calcarea	X		
Splachnum vasculosum	X	X	
Lichens			
Baeomyces rufus		X	
Cyphelium tigillare		X	X
Flavopunctelia soredica		X	X
Hypocenomyce friesii		X	
Melanelia olivacea		X	
Nephroma bellum	X	X	
Parmelia omphalodes		X	
Psora himalayana	X	X	X
Ramalina dilacerata	X	X	
Ramalina sinensis			X
Vascular Plants			
Aquilegia jonesii	X	X	
Arnica parryi	X	X	
Botrychium spp.(ascendens, simplex, spathulatum)		X	
Carex backii	X	X	
Carex lacustris	X	X	X
Carex vulpinoidea	X	X	
Cryptantha minima	X	X	X
Draba porsildii	X	X	
Dryopteris cristata	X	X	X
Elodea bifoliata	X		
Erigeron lackschwetzii	X	X	
Erigeron trifidus		X	X
Eupatorium maculatum		X	
Halimolobos virgata	X	X	
Iris missouriensis		X	X
Isoetes echinospora	X	X	
Larix occidentalis	X	X	
Malaxis paludosa	X	X	X
Najas flexilis	X	X	

Appendix 1. Continued.

Species	**2006**	**2007**	**2008**
Oenothera flava	X		
Oxytropis lagopus	X	X	X
Pedicularis flammea	X	X	
Pellaea gastonyi	X	X	
Pinus albicaulis	X	X	X
Pinus flexilis	X	X	X
Plantago maritima		X	
Polygala paucifolia		X	X
Prenanthes sagittata	X	X	
Psilocarphus brevissimus	X	X	
Salix lanata calcicola	X	X	
Salix stolonifera	X	X	
Silene involucrate	X		
Tradescantia occidentalis		X	X
Tripterocalyx micranthus	X	X	X
Viola pedatifida		X	
Woodsia glabella	X	X	X
TOTAL	**38 species**	**51 species**	**21 species**

Appendix 2. Example of a rare species plant summary form presented to Adopt-a-Plant Alberta volunteers at training workshops along with herbarium specimens, illustrations and maps. Plant summary forms provide information on the species' identifying characteristics and habitat preferences to aid in field identification.

Plant Summary Form	
Species Common Name	Smooth Woodsia
Scientific Name with Authority	*Woodsia glabella* R.Br. Richardson
Identifying Characteristics	
Leaves	Pale green, hairless (4-16 cm long, 6-15 cm wide); 1-2 pinnate; 8-15 pairs egg-shaped; 3-7 lobed leaflets. Leaves arise in clusters from a short rhizome, with persistent bases
Stipes	Stalks hairless, delicate, straw-coloured to green, jointed near the base (see below).
Spores	Membranes covering spore sacs (indusium) are inconspicuous with 5-8 hairs or thread-like segments (looks like little spider legs)
Other	
Similar plants and Distinguishing Features	
Rusty woodsia (*Woodsia ilvensis*) has brown stalks and is hairy (also jointed although unlike the other two *Woodsia* spp.). Leaves of *W. ilvensis* are hairy and wider (10-35 mm across and the indusium is conspicuous). *W. ilvensis* is found in the Shield Region. Plants of *W. glabella* resemble *Asplenium viride*, which has a linear indusium over the long narrow sori. Take photos showing persistent leave bases and form of plant, and if there are sufficient reproductive leaves, take 2 or 3 leaves with sori. This species will need to be confirmed by an expert botanist.	
Phenology (best time to identify):	Summer to early autumn
Annual or Perennial	Perennial
Vegetation Type	Herb
Soil Type, Texture, Moisture Levels, pH	Moist shaded calcareous rocks, cliffs, crevices: Rockies.
Substrate and Substrate Chemistry (especially important for bryophytes and lichens)	Calcareous rocks, boulders, crevices
Slope, Aspect	Sheltered
Recommended References (keys, illustrations etc.) and clarify conflicting keys, if any.	
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Appendix 3. Rare native plant and lichen survey form provided by the Alberta Natural Heritage Information Centre (ANHIC). Note that ANHIC currently prefers the use of a digital spreadsheet of this form.

ALBERTA NATURAL HERITAGE INFORMATION CENTRE

RARE NATIVE PLANT AND LICHEN SURVEY FORM

Please enter all information available to you and attach a detailed sketch or map showing the location of the population and/or area search. Submit the form even if the targeted species is not found. Electronic submissions are preferred.

SPECIES: _____

OBSERVER NAME, ADDRESS, TELEPHONE NUMBER AND E-MAIL: _____

SURVEY DETAILS:
SURVEY DATE(S): _____
1st VISIT OR REPEAT VISIT TO SITE:_____ EO NUMBER IF REPEAT VISIT:_____
TYPE OF SURVEY (check one): ____targeted survey for this species _____general rare plant survey
_____targeted survey for another species. If so, name other species_____
SURVEY EFFORT: time spent_____ and/or size of area searched (please attach map or provide utm coordinates of area searched)_____

DOCUMENTATION:
PHOTOGRAPH TAKEN (please attach to form if possible): Y / N
SPECIMEN COLLECTED: Y / N COLLECTION NUMBER: _____
NAME OF HERBARIUM WHERE DEPOSITED (and accession number): _____
DETERMINATION (check where appropriate and fill in blanks): determined by _____
__keyed (reference used)_____ compared with specimen at _____
__compared with illustration/photo in _____ verified by _____
__ key characteristic(s) used for determination_____

LOCATION INFORMATION (please attach map):
SITE NAME: _____
TOPOGRAPHIC MAP NUMBER: _____ Was the location determined using a GPS? Y / N
DIRECTIONS TO POPULATION (*include descriptions of landmarks and distances if possible*):

ELEVATION:_____ m SOURCE OF CO-ORDINATES (GPS, TOPO MAP): _____
UTM EASTING: _____ UTM NORTHING: _____ Precision (+/-m) _____
GRID ZONE: _____ NORTH AMERICAN DATUM: __ 27 __ 83
LEGAL: TWP: _____ RGE: _____ W:_____ M SECTION: _____ LSD: _____
LATITUDE: _____ LONGITUDE: _____

POPULATION INFORMATION: ___ count or ___estimate (check one)
Number of individuals (for vascular plants) or number and size of clumps (for bryophytes and lichens):
_____vegetative _____in bud _____in flower
_____immature seed/spore producing structure _____mature seed/spore producing structure
_____dispersing seed/spores _____seedlings _____fruit/sporophyte from previous years
Extent of population: length_____ width_____ (map as polygon if possible)

Shape of area (attach sketch if possible and/or include polygon information from gps unit or shape file):

FULL EXTENT OF POPULATION KNOWN: _____YES _____NO _____UNKNOWN

SITE/HABITAT DESCRIPTION (*include information on habitat [alpine, aquatic, cliff, forest, grassland, peatland for vasculars, plant communities / dominant species / associated species. Attach extra sheet if necessary.) Information on plant community can be provided using existing forms such as ANHIC ecological community form*:

SUBSTRATE (for non-vasculars and lichens) (check appropriate category for all that apply and list type):
___wood _____ ____bark_____ ___rock _____
___ soil _____ ____other (name)_____
ASPECT: _____SLOPE: _____
MOISTURE:
___inundated ___saturated (wet-mesic) ___ moist (mesic) ___ dry-mesic ___ dry (xeric)
LIGHT LEVELS:
___open ___partial ___filtered ___shade
SOIL pH (if known):_____ SOIL TEXTURE (if known):_____ SOIL TYPE (if known): _____
WATER pH (if known) _____

CURRENT LAND USE: _____

OWNERSHIP (*if known. Include name/address/phone number*): _____

DOES THE LANDOWNER WANT THE EXACT LOCATION WITHHELD FROM THE PUBLIC: _____

THREATS TO HABITAT OR POPULATION (include information on whether population will be impacted by development): _____

CONSERVATION/MANAGEMENT NEEDS (include information on proposed mitigation): _____

Appendix 4. Example of a feedback survey form provided to Adopt-a-Plant Alberta volunteers at the end of the field season.

Feedback Questionnaire for Adopt-a-Plant Alberta Volunteers - 2008

1. Did you enjoy participating in Adopt-a-Plant Alberta in 2008? Are there any experiences that were particularly enjoyable or, alternatively, that were not enjoyable that you would like to share?

2. How could APA better prepare volunteers for the summer of 2009? Is there any additional information you would like to see offered at workshops?

3. This year, there were workshops in a one-day format (Lethbridge) and a two-day format (Edmonton). Would you like to see the program move toward one-day workshops? If you attended the Lethbridge workshop, did you find the one-day format adequate to prepare you for the field season?

4. Was having a program coordinator helpful to you during your work this summer? How can the coordinator better assist volunteers and/or help make the experience more enjoyable?

5. Did you attend any of the group field surveys this summer? If not, were there specific reasons why you were not able to attend? Would you like to continue to have the option to participate in these events or do you feel they are not a necessary part of the program?

6. If you attended a group field event, are there any comments you would like to make specifically regarding location, organization, species, etc. of these events (positive or negative)?

7. Did you use the website this year? What types of things would you like to see on the website to improve it?

8. We developed a site on FACEBOOK in 2008 for volunteers to communicate with each other. Did you find the FACEBOOK site useful and do you see yourself using it in the future? If no, please comment. Would you prefer another method of communication (chat forum on our program website)?

9. Please feel free to provide any additional comments here.

Thank you for taking the time to fill out this questionnaire and thanks so much for your participation in Adopt-a-Plant Alberta!

Appendix 5. Records collected by Adopt-a-Plant Alberta volunteers in 2006. Records include those for rare species prioritized in 2006, rare species not prioritized in 2006, and for other species observed incidentally.

Species	Volunteers adopting the species	Total Records	Number of records that were new locations	Number of records that were relocations of previous observations
FOCAL RARE SPECIES				
Bryophytes				
Aloina brevirostris	2			
Amblyodon dealbatus	1			
Entodon schleicheri	8			
Fontinalis antipyretica	1			
Leskea polycarpa	2	1	1	0
Seligeria calcarea	1			
Splachnum vasculosum	4			
Lichens				
Nephroma bellum	2			
Psora himalayana	2			
Ramalina dilacerata	2			
Vascular Plants				
Aquilegia jonesii	2			
Arnica parryi	3			
Carex backii	7	2	2	0
Carex lacustris	7	2	0	2
Carex vulpinoidea	4			
Cryptantha minima	1			
Draba porsildii	1			
Dryopteris cristata	5	2	1	1
Elodea bifoliata	1			
Erigeron lackschwetzii	2			
Halimolobos virgata	0			
Isoetes echinospora	2	1	1	0
Larix occidentalis	1			
Malaxis paludosa	8			
Najas flexilis	2			
Oenothera flava	1			
Oxytropis lagopus	1			
Pedicularis flammea	5	1	0	1
Pellaea gastonyi	3			
Pinus albicaulis	7			
Pinus flexilis	4			
Prenanthes sagittata	3			
Psilocarphus brevissimus	2			
Salix lanata calcicola	3			
Salix stolonifera	2			
Silene involucrata	1			
Tripterocalyx micranthus	0			
Woodsia glabella	2	1	1	0

Appendix 5. Continued.

Species	Volunteers adopting the species	Total Records	Number of records that were new locations	Number of records that were relocations of previous observations
NON-FOCAL RARE SPECIES				
Neckera pennata	N/A	1	1	0
Rhodobryum ontariense	N/A	1	1	0
Carex lasiocarpa	N/A	1	1	0
Pellaea glabella	N/A	1	1	0
Sarracenia purpurea	N/A	1	1	0
INCIDENTAL OBSERVATIONS				
Carex retrorsa	N/A	2	2	0
Carex rostrata	N/A	1	1	0
Carex trisperma	N/A	1	1	0

Appendix 6. Records collected by Adopt-a-Plant Alberta volunteers in 2007. Records include those for rare species prioritized in 2007, rare species not prioritized in 2007, and for other species observed incidentally.

Species	Volunteers adopting the species	Total Records	Number of records that were new locations	Number of records that were relocations of previous observations
FOCAL RARE SPECIES				
Bryophytes				
Aloina brevirostris	4	1	0	1
Aloina rigida	0	2	2	0
Amblyodon dealbatus	0			
Bartramia halleriana	0			
Bartramia pomiformis	0			
Bryum porsildii	2			
Entodon schleicheri	6			
Fontinalis antipyretica	0			
Splachnum vasculosum	1			
Lichens				
Baeomyces rufus	0			
Cyphelium tigillare	0			
Flavopunctelia soredica	1			
Hypocenomyce friesii	0			
Melanelia olivacea	4			
Nephroma bellum	1			
Parmelia omphalodes	0			
Psora himalayana	4			
Ramalina dilacerata	2			
Vascular Plants				
Aquilegia jonesii	3			
Arnica parryi	3			
Botrychium spp. *(ascendens, simplex, spathulatum)*	3			
Carex backii	3	2	0	2
Carex lacustris	4	2	0	2
Carex vulpinoidea	2	2	0	2
Cryptantha minima	2			
Draba porsildii	1			
Dryopteris cristata	4			
Erigeron lackschwetzii	0			
Erigeron trifidus	4			
Eupatorium maculatum	5	1	1	0
Halimolobos virgata	0			
Iris missouriensis	4			
Isoetes echinospora	2	2	0	2
Larix occidentalis	1			
Malaxis paludosa	2			

Appendix 6. Continued.

Species	Volunteers adopting the species	Total records	Number of records that were new locations	Number of records that were relocations of previous observations
Najas flexilis	1			
Oxytropis lagopus	1	2	2	0
Pedicularis flammea	6	1	0	1
Pellaea gastonyi	1			
Pinus albicaulis	3			
Pinus flexilis	2			
Plantago maritima	3	1	1	0
Polygala paucifolia	2	1	0	1
Prenanthes sagittata	2			
Psilocarphus brevissimus	0			
Salix lanata calcicola	2			
Salix stolonifera	2			
Tradescantia occidentalis	1			
Tripterocalyx micranthus	1			
Viola pedatifida	2	7	3	4
Woodsia glabella	1			
NON-FOCAL RARE SPECIES				
Entodon concinnus	N/A	1	1	0
Carex adusta	N/A	1	1	0
Carex houghtoniana	N/A	1	1	0
Wolffia columbiana	N/A	1	1	0
INCIDENTAL OBSERVATIONS				
Carex retrorsa	N/A	1	1	0
Corallorhiza striata	N/A	2	2	0
Dryopteris carthusiana	N/A	1	0	1

Appendix 7. Records collected by Adopt-a-Plant Alberta volunteers in 2008. Records include those for rare species prioritized in 2008, rare species not prioritized in 2008 but prioritized in 2006 and/or 2007, rare species not prioritized in any year, and other species observed incidentally.

Species	Volunteers adopting the species	Total Records	Number of records that were new locations	Number of records that were relocations of previous observations
FOCAL RARE SPECIES				
Bryophytes				
Bryum porsildii	1			
Callicladium haldanianum	5			
Entodon schleicheri	6			
Leskea polycarpa	5			
Lichens				
Cyphelium tigillare	0			
Flavopunctelia soredica	3			
Psora himalayana	6	1	0	1
Ramalina sinensis	4	1	1	0
Vascular Plants				
Carex lacustris	9	5	5	0
Cryptantha minima	0			
Dryopteris cristata	3			
Erigeron trifidus	3			
Iris missouriensis	6			
Malaxis paludosa	5	1	0	1
Oxytropis lagopus	2			
Pinus albicaulis	8	10	10	0
Pinus flexilis	7	12	12	0
Polygala paucifolia	3	2	1	1
Tradescantia occidentalis	3			
Tripterocalyx micranthus	1	4	0	4
Woodsia glabella	7			
PREVIOUS FOCAL SPECIES				
Aquilegia jonesii	N/A	1	0	1
Carex vulpinoidea	N/A	2	1	1
Pedicularis flammea	N/A	2	1	1
Plantago maritima	N/A	2	0	2
Prenanthes sagittata	N/A	3	1	2
NON-FOCAL RARE SPECIES				
Allium geyeri	N/A	1	0	1
Astragalus bodinii	N/A	1	1	0
Astragalus kentrophyta	N/A	1	1	0
Camassia quamash	N/A	1	1	0
Carex houghtoniana	N/A	1	1	0
Hydrophyllum capitatum	N/A	1	1	0
Nymphaea leibergii	N/A	1	1	0
Physostegia ledinghamii	N/A	1	1	0
Sarracenia purpurea	N/A	1	1	0

Appendix 7. Continued.

Species	Volunteers adopting the species	Total Records	Number of records that were new locations	Number of records that were relocations of previous observations
INCIDENTAL OBSERVATIONS				
Bryophytes (various in 1 clump)	N/A	1	1	0
Asclepias speciosa	N/A	1	1	0
Carex retrorsa	N/A	1	1	0
*Corallorhiza maculata**	N/A	1	1	0
Dryopteris expansa	N/A	2	0	2
Hudsonia tomentosa Nutt.	N/A	1	1	0
Listera borealis	N/A	1	1	0
Potamogeton prelongus	N/A	1	1	0

* ANHIC denoted this as a species that required additional information (ANHIC 2006).

For a list of additional reports in the Alberta Fish and Wildlife Division – Species at Risk Series please go to our website:

http://srd.alberta.ca/BioDiversityStewardship/SpeciesAtRisk/ProgramReports.aspx

Thank you!