alberta's species at risk program

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

Program Summary 2009–2011

Alberta Species at Risk Report No. 145

Alberta Government

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

Program Summary 2009–2011

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Adopt-a-Plant Alberta Steering Committee Members and Treasurer:
2009: Dana Bush (Chair), Coral Grove, Robin Gutsell, Mryka Hall-Beyer, Ed Karpuk, Todd Kemper, Janet Marsh, Lisa Matthias, Leslie Monteleone.
(Program Coordinator) Kelley Kissner.

2010: Dana Bush, Robin Gutsell, Mryka Hall-Beyer, Ed Karpuk, Todd Kemper, Meghan Klaudt, Janet Marsh, Lisa Matthias (Chair), Sandy McAndrews, Leslie Monteleone, Peter Whitehead .
(Program Coordinator) Nora Manners.

2011: Kristen Anderson, Robin Gutsell, Mryka Hall-Beyer, Meghan Klaudt, Janet Marsh, Lisa Matthias (Chair), Sandy McAndrews, Leslie Monteleone, Peter Whitehead.

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EXECUTIVE SUMMARY

Adopt-a-Plant Alberta (APA) is a not-for-profit, volunteer-based program that was founded in 2005, and operates under the auspices of the Alberta Native Plant Council (ANPC). The two main areas of the program are collection of data on target rare plant species (to be used in status assessments) and participation in recovery actions for listed species, with a focus on inventory/monitoring and habitat stewardship. Since its inception in 2005, APA has completed six successful field seasons and has trained dozens of volunteers who have spent hundreds of hours locating and documenting occurrences of rare plants, bryophytes, and lichens and have taken part in habitat stewardship activities throughout the province.

This report provides a summary of the APA Program from 2009 to 2011. APA has successfully acquired funds and in-kind contributions to support the three field seasons of work from 2009 to 2011. During the three years, in-kind contributions have increased significantly. Over 100 volunteers participated in APA either as volunteers, professional botanists, field trip leaders, etc. in the three years. From 2009 to 2011, APA volunteers contributed over 170 records to ACIMS, identified 95 rare plant species and submitted over 20 specimens to herbariums.

Each field season began with a training session in May to prepare volunteers for the field season with information and tools. From 2009 to 2011 over 20 conservation and stewardship field events were organized, as well as other trips and excursions. Some of these events were in support of provincial efforts such as the annual Western Spiderwort Monitoring and Habitat Stewardship with Alberta Environment and Sustainable Resource Development, Western Blue Flag Population Inventory with the MULTISAR Program and the Tiny Cryptantha and Small-flowered Sand Verbena Monitoring and Habitat Stewardship with Alberta Environment and Sustainable Resource Development and Medicine Hat College.

Overall, the project has resulted in additional data for a number of Alberta's rare plants, improved stewardship of several plant species at risk, and a growing group of knowledgeable and enthusiastic volunteers interested in conserving Alberta's rare plants and their habitats. The success that the APA program has achieved so far would not have been possible without the commitment of its volunteers and the support of a host of other volunteers that play a vital role, volunteering their time to coach at workshops, lead field events, verify specimens, provide maps of rare plant search areas, maintain the APA website, and many other efforts. APA is recognized as an organization that can be called upon to provide expertise, enthusiasm and support for stewardship of rare plants in our province.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1. INTRODUCTION

1.1. Background

Adopt-a-Plant Alberta (APA) is a not-for-profit, volunteer-based program that operates under the auspices of the Alberta Native Plant Council (ANPC). APA was founded in 2005 by members from the primary provincial organizations involved with rare plant and species at risk conservation: Alberta Native Plant Council, Alberta Parks Division (Alberta Conservation Management System – ACIMS), Alberta Fish and Wildlife Division and Devonian Botanic Garden (University of Alberta). The two main areas of the program are collection of data on target rare plant species (to be used in status assessments) and participation in recovery actions for listed species, with a focus on inventory/monitoring and habitat stewardship.

APA trains volunteer plant enthusiasts from across Alberta to become citizen scientists. These volunteers are trained to identify and record observations of rare native plants, bryophytes, lichens and rare ecological communities that are of particular conservation concern throughout the province. All data collected by volunteers are housed in the conservation database of the Alberta Conservation Information Management System (ACIMS, formerly ANHIC). This information is used to help resource managers undertake formal conservation status assessments of the species, and to help land managers and industry in planning developments and 'flagging' locations of rare plants in order to mitigate potential effects of land and industrial developments.

A lack of detailed population, distribution and habitat information on many rare plant species (including some threatened and endangered species) has made it difficult to determine how best to conserve, manage, and restore some rare plant populations in Alberta. Botanical expertise is needed to collect this kind of data. In the absence of the necessary resources to fund professional botanists to collect the breadth of information needed for conservation purposes, many botanists have volunteered their time to train volunteers to help with this effort. Long-term data collection by APA volunteers for targeted species such as those that aren't yet listed, but may be at risk of extinction in Alberta will enable more species to progress through the province's detailed status assessment process.
Since its inception in 2005, APA continues its success at addressing the ongoing need to gather more information about rare plants in Alberta, and to promote an awareness of rare plants and related management issues. Throughout this time, APA has completed six successful field seasons and has trained dozens of volunteers who have spent hundreds of hours locating and documenting occurrences of rare plants, bryophytes and lichens, and have taken part in habitat stewardship activities throughout the province. The program has grown from conducting surveys primarily in protected areas, parks, wildlands and natural areas to including search areas on provincial Crown lands, Nature Conservancy of Canada (NCC) owned properties, and some private lands (by invitation only). APA is recognized as an organization that can be called upon to provide expertise, enthusiasm and support for stewardship of rare plants in Alberta.

This report is the second APA Program Summary Report, which covers the activities of APA from 2009 to 2011. The first report was published in 2010, entitled:
APA: A Volunteer-based Conservation Initiative for Rare Plants & Lichens, Program Summary 2005-2008 http://aep.alberta.ca/fish-wildlife/species-at-risk/species-at-risk-publications-web-resources/plants/default.aspx

1.2. Goals and Objectives

The goal of APA is to provide much needed data for conservation and recovery of rare and at-risk plant species in Alberta. The program aims to do this by engaging and training volunteer plant enthusiasts, 'citizen scientists', to search for, monitor, and carry out stewardship activities related to targeted plants and lichen species in Alberta.

APA 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.
- Engage professional botanists, bryologists, lichenologists, 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 professionals.
- Submit new data for rare species each year to ACIMS, which tracks information on rare plants, bryophytes and lichens in Alberta.
- Collect adequate data over three to five years of program implementation to allow for commissioning of detailed status reports for several target species.
- Contribute to a variety of 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 meetings its goals and objectives.

1.3. Organizational Structure

1.3.1. Administration

The APA Program is managed by a Steering Committee and administered in part by the ANPC. 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. The Steering Committee meets throughout the year to lead program development and implementation, budgeting and funding and direction. The Treasurer of ANPC is also the Treasurer for the APA program

and a member of the APA Steering Committee. The Treasurer monitors program funds and spending and APA provides quarterly reports to ANPC. All APA volunteers are members of ANPC, with membership fees paid directly to ANPC.

For the 2009 and 2010 season, APA was able to hire a part-time Program Coordinator to work with the program and assist with operations and volunteer efforts. The program coordinator managed all aspects of the program including setting up workshops, field events, communicating with volunteers throughout the field season, collecting and collating data, and managing the budget and reporting. Since 2011 and going forward, program activities have been managed by the Steering Committee and other volunteers. Occasionally, other contractors are hired to undertake specific work associated with the program, such as writing reports.

1.3.2. Sponsors and Partners

The APA receives valuable logistical support from professional botanists, bryologists, lichenologists and resource managers, and from a wide variety of resource management agencies, conservation organizations and private land stewardship organizations.

1.3.3. Program Support

The program relies on cash and in-kind contributions from numerous individuals, agencies and organizations. The APA program continues to foster and expand collaborations, partnerships and funding for its continued operation.

2. PROGRAM METHODS 2009 – 2011

2.1. APA Species Prioritization

The APA program focuses on the collection of data on rare vascular plants, bryophytes and lichens. Each year a list of targeted species is drawn up and includes all threatened and endangered plants. The target list was consistent from 2009 to 2011, in recognition that most rare species still require a great deal of data collection regarding their distribution and population sizes and that APA had developed a list suitable to both conservation priorities and volunteer capacity.

APA had previously developed a set of criteria for selecting and prioritizing species for the program, which has been revised as needed as the program evolves. Table 1 shows the criteria currently used for APA species prioritization. The prioritization method used several criteria to assign priority to species, including the following: species ranking or rarity (ACIMS 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. Other criteria included ease of identification, volunteer interest in particular rare species and species geographic proximity to volunteers' locations (area of residence) within Alberta. APA also targeted several species that were identified by provincial botanists and species specialists as

having nearly adequate survey data to allow them to enter the status review process or requiring data to allow status ranking.

Table 1. Criteria for Prioritization of Plants, Bryophytes and Lichens for the Adopt-A-Plant Program

Criteria	Score[1]
Species Rank	
Subnational (Alberta) Rank: S1, S2, S2S3	2
Subnational (Alberta) Rank: S3	1
Global Rank: G1, G2, G2G4	2
Global Rank: G3, G3G5	1
May Be at Risk (vascular plants only)	2
Watch List, Sensitive, G4, G5, G4, G5	0
Status undetermined, Exotic, Crustose Lichen	0
Species ID Certain (ACIMS Database)	
Yes	1
No	0
Last observation date (ACIMS Database)	
2000-2006	2
1990-1999	1
<1989	0
Precision of Mapping Code (ACIMS 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 (Locations in ACIMS 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]Vascular plant maximum points = 14
Bryophytes and lichens maximum points = 12

2.2. Alberta Species Ranking Overview

The following rare plants, mosses, and lichens were listed as endangered or threatened under Schedule 6 of Alberta's Wildlife Regulation at the time of this report:

Endangered Species
Tiny cryptantha (*Cryptantha minima*)
Soapweed (*Yucca glauca*)
Western spiderwort (*Tradescantia occidentalis*)
Porsild's bryum (*Bryum porsildii*)
Limber pine (*Pinus flexilis*)
Whitebark pine (*Pinus albicaulis*)
Slender mouse-ear-cress (*Halimolobos virgata*)

Threatened Species
Small-flowered sand verbena (*Trypterocalyx micranthus*)

2.3. Volunteer Recruitment

APA used a variety of methods to recruit volunteers and increase awareness of the program across the province. Each spring, APA contacted previous volunteers and other interested individuals to alert them to upcoming volunteer training workshops and other program activities for the new field season. Information was made available through the various Rare Plant Study Groups, and regularly updated on the APA website. APA also published articles and announcements in natural history publications, such as *Iris* (ANPC), *Nature Alberta* (Federation of Alberta Naturalists) and the *Wildlands Advocate* (Alberta Wilderness Association). Whenever possible, presentations were given on APA's activities to supporting agencies and organizations at meetings and conferences (e.g., ANPC Annual General Meeting, college and university botany classes). APA also hosted a display at ANPC Annual General Meetings and other venues.

2.4. Volunteer Training and Support

The key aim of Adopt-a-Plant Alberta is to encourage volunteers to adopt one or more rare plants from a list of priority species and provide them with the tools and experience necessary to locate and record observations of their adopted plant(s) in the province.

At the start of each field season in May, technical training workshops were organised to ensure volunteers had the appropriate technical and safety training and equipment they needed and were adequately prepared to search for their adopted plants. These one-day workshops provided an opportunity for volunteers to learn from professional botanists and resource managers. Volunteers studied rare plant identification, survey methods, standardized data collection methods, use of GPS units and topographic maps, collection/preservation of plant specimens, and field safety.

Additional on-site training was provided by group leaders and professional botanists for various field events and excursions held during the field season. An online tutorial and guidance on mapping and GPS use was provided by Dr. Mryka Hall-Beyer, University of Calgary, and was made available to volunteers on the APA website. APA provided volunteers with a training manual and equipment on loan, such as GPS units, hand lenses and plant presses. APA also provided access to important information, tools and an events calendar through the APA and ANPC websites. APA volunteers also had access to herbaria to support their training and data collection efforts.

During the winter months from October to April, APA trainers and invited guests trained volunteers to recognise rare plants in the field through the rare plant study groups in Calgary, Edmonton and Medicine Hat.

Safety of volunteers was a primary concern for APA, particularly because volunteers often work in remote areas when accessing field sites and conducting surveys. Volunteers

were encouraged to work together whenever possible and were provided safety training at the beginning of the season.

2.5. Organized Field Events and Group Excursions

In addition to individual volunteer efforts, APA also organized group field events throughout the summer where volunteers could spend time working in the field with knowledgeable leaders. Through these field events, APA volunteers visited areas where rare plants had been recorded historically and where an inventory of the plants was considered a priority. Group events often were designed to assist resource management agencies, private stewardship organizations, or plant species at risk recovery programs with further rare plant inventories and specific conservation or habitat stewardship initiatives.

Informal group excursions were organised by individuals who were willing to share their time and knowledge, or just wanted some company on a daytrip spent looking at or recording adopted plants. Several excursions were completed in various parts of Alberta.

2.6. APA Website

The APA website was established early on in the program, and was hosted through the University of Calgary. In 2011, Dr. Peter Whitehead of Cape Ecology Ltd. volunteered to take over the redesign and management of the site, and established an independent APA domain and website. The website is a very important communication and information component for APA, and houses various reference materials, presentations and other information, as well as a regularly updated events section for APA events and excursions.

2.7. Provincial Initiatives

APA volunteers conducted surveys to support recovery plans for 'at risk' plant species in Alberta, such as the annual Western Spiderwort Monitoring and Habitat Stewardship with Alberta Environment and Sustainable Resource Development, Western Blue Flag Population Inventory with the MULTISAR Program and the Tiny Cryptantha and Soapweed Monitoring and Habitat Stewardship with Alberta Environment and Sustainable Resource Development and Medicine Hat College.

2.8. Volunteer Data Collection

APA 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 specimens that were necessary to verify volunteers’ observations. Program volunteers were not permitted to collect species that were listed provincially or federally as species at risk. Research permits were obtained for various federal national parks, provincial parks, natural and protected areas. APA also collaborated with NCC to provide access to APA volunteers to their fully-owned properties in return for providing information about rare plants on the

properties. Volunteers who wished to access privately-owned lands on their own must first have received written permission by the landowner and discussed access with APA before doing so. In 2011, over 50 provincial parks and protected areas were listed on the permit, as well as the national parks.

Volunteers were trained to gather and record standardized data and to follow protocols set out by ANPC or other published guidelines, resource managers or recovery teams to ensure appropriate information was collected critical to advancing knowledge of the species. Guidelines such as ANPC's *Guidelines for Rare Plant Surveys in Alberta*, 2000, ANPC's *Recommended Documents for Botanical Surveys in Areas of Proposed Disturbance*, 2010 and Environment Canada, Canada Wildlife Service's *Occupancy Survey Guidelines for Prairie Plant Species at Risk*, 2009 were used. APA and ANPC websites provided links to other documents and information that could assist volunteers with their surveys and data collection. ACIMS provided information for element occurrence (EO) requests, and in 2011 offered a new online process for searches, the *ACIMS Data Request* process.

Volunteers recorded their data using the ACIMS "Rare Native Plant and Lichen Survey Form", for each rare plant, moss and lichen reported on. (See Appendix 3).
All data collected by APA volunteers each year was submitted to ACIMS.

The ACIMS form records information on the geographic location of the observed plant occurrence and whether it's a new survey or a return visit to a previous EO. Other information includes 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, 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 records).

APA emphasized the collection of photographic evidence as the primary means of verification, because of the focus on species that are considered rare and potentially limited in population size and/or extent. Volunteers were instructed to provide photographs of each observed rare species and its identifying characteristics, habitats and other details. Where necessary, volunteers were trained to collect a specimen (whole plant) or identifying feature (e.g., part of a flower or seed pod or other plant part). Volunteers were trained to follow the ANPC Collection Guidelines for rare plant populations.

Volunteers were also taught at workshops how to properly press collected specimens suitable as herbarium specimens for long-term preservation and reference.

2.9. Data and Specimen Disposition

Every year, volunteers submitted their data, photographs and specimens to one central location. Volunteer Meghan Klaudt organized, verified and submitted the data to ACIMS on behalf of APA. Volunteers were encouraged to provide information necessary to verify their observations, particularly for volunteers with little previous experience identifying rare plants. The program engaged professional botanists and species specialists to donate their time to verify collected specimens and photographs.

Once verified, specimens were submitted to herbaria for curation into their collections. Vascular plant specimens were submitted to the University of Alberta and University of Calgary herbaria, bryophytes and lichens were submitted to Devonian Botanic Garden, Royal Alberta Museum or the University of Calgary herbarium.

2.10. Volunteer Recognition and Wrap-up Events

At the end of each field season, wrap-up events were organized in at least two locations, usually Calgary and Edmonton areas, to recognize APA volunteers for their contributions over the year, to celebrate successes and to share stories and interesting finds. The wrap-up events provided volunteers an opportunity for a debriefing of the field season and an evaluation session to provide feedback to the Steering Committee on successes and program improvements. Volunteers also returned their data collection packages, herbarium specimens and loaned equipment.

3. FINANCIAL AND IN-KIND SUPPORT[1]

3.1. Cash Contributions

APA received funds from several sources between 2009 and 2011 to undertake program activities and administer the program, including: the Government of Canada -Habitat Stewardship Program (HSP), Alberta Fish and Wildlife/Environment and Sustainable Resource Development (ESRD), Alberta Conservation Association (ACA), Husky Energy and others including a generous contribution by an individual. Contributions from HSP and some funding provided by ESRD were specifically targeted to support work on federally and provincially listed at-risk plant species.

The total value of cash contributions to APA between 2009 and 2011 was $125,120.

Table 2: Cash Contributions to APA between 2009 and 2011.

2009	58,952.52

[1] ***NOTE: This report was completed prior to the 2011-12 year-end of March 31, 2012, therefore the 2011-12 information is based on an interim statement. However, final year-end information is not expected to be significantly different, as the majority of the activities and related income/expenses occur during the field season (May to October).*

2010	56,809.61
2011	9357.63
Total	**$125,120.00**

3.2. In-Kind Contributions

APA receives generous support and substantial in-kind contributions every year from many organizations, agencies and individuals including: donated human resources (volunteers and professionals), materials and supplies, equipment, office space, printing and production services, website design and maintenance, and other logistical support. These contributions significantly reduced the amount of cash funds required by the program, allowing it to operate on an increasingly smaller budget.

The largest in-kind contribution was time donated by program volunteers to conduct fieldwork and surveys, and the time and skills donated by professionals and agencies associated with training of program volunteers, and through the Steering Committee. In-kind human resources were valued at $15/hour for APA volunteers and $35/hour for professionals. Many individual professional botanists, bryologists and lichenologists loaned their expertise and specimens from their personal collections for use in training sessions.

Table 3: In-Kind Contributions By APA Volunteers and Organizations.

Volunteers/Organizations	**2009**	**2010**	**2011***
	Hours x Rate ($)	Hours x Rate ($)	Hours x Rate ($)
Adopt A Plant Volunteers	9006.73	9194.85	30,000.00
Other APA SC Members	1700.00	10255.00	20,000.00
Alberta Native Plant Council	5378.30	320.00	500.00
Alberta Natural Heritage Information Centre	726.25		
Alberta Environment and Sustainable Resource Development (ESRD)	2341.00	4875.00	13500.00
University of Alberta	310.00	630.00	--
University of Calgary	2325.00	600.00	500.00
Total:	**$21,787.28**	**$25,874.85**	**$64,500.00**

**in-kind contributions for 2011 (interim report December 31, 2011)*

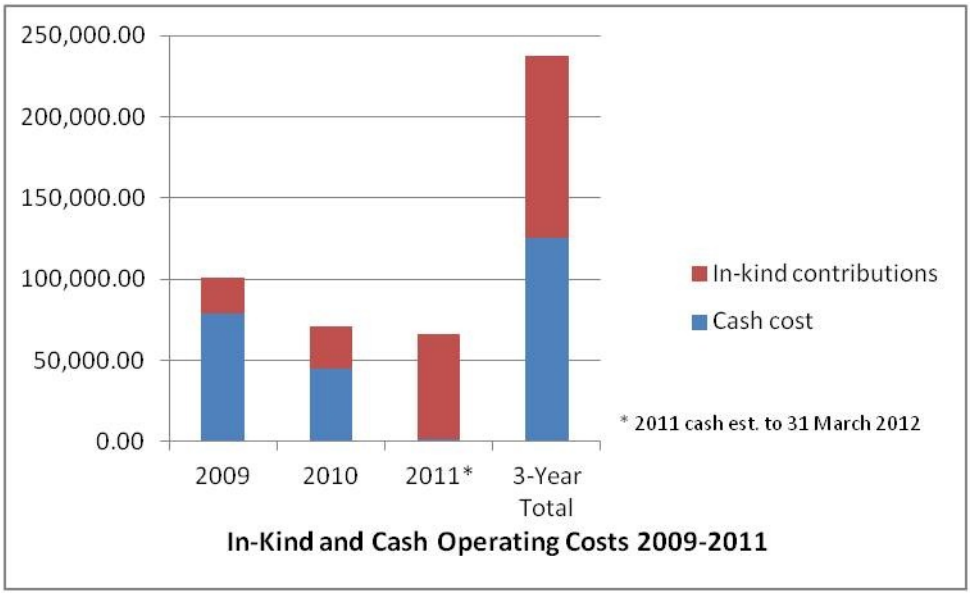

Figure 1. In-Kind and Cash Operating Costs 2009-2011

3.3. Program Operating Expenses

In 2009 and 2010 a paid program coordinator position was in place, but not for 2011. As well, some volunteer travel expenses were supported by funding; however, APA volunteers still donated hundreds of hours of time to participate in field surveys and events. Their time and any remaining travel costs not covered by the subsidy were also considered part of their in-kind contribution.

The total program operating expenses for the three years of the program were: $125,232.63.

Table 4: Total Program Operating Expenses 2009 to 2011.

2009	78,795.46
2010	44,714.07
2011*	1723.10
Total	$125,232.63

**Estimated to March 15, 2012*

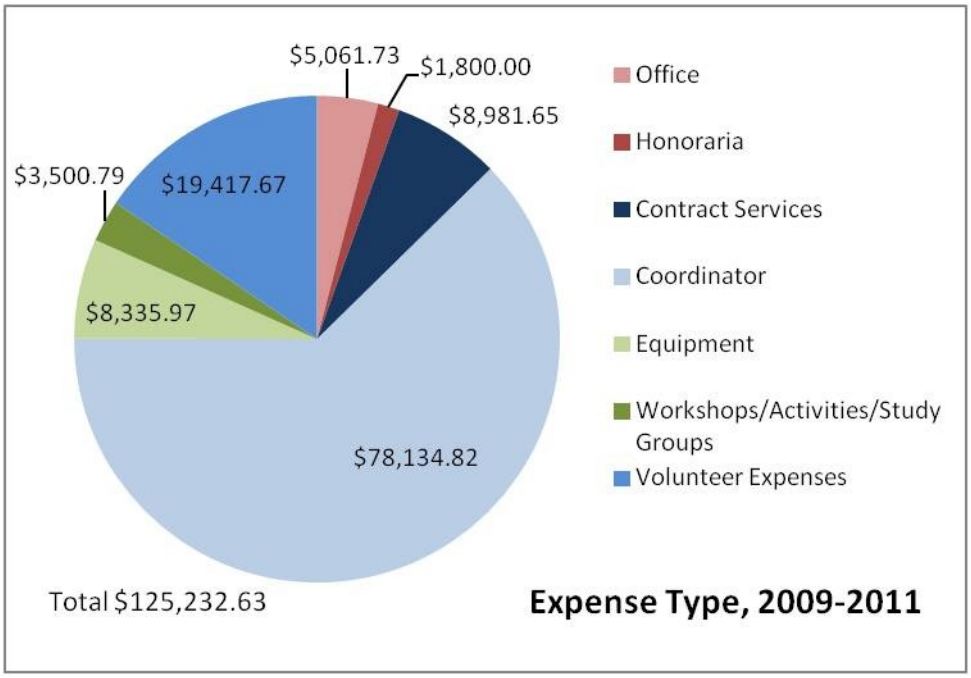

Figure 2. Total Program Operating Expenses 2009 to 2011.

4. PROGRAM RESULTS AND ACCOMPLISHMENTS

4.1. Volunteer Participation

Between 2009 and 2011, over 100 volunteers participated in APA, either as volunteers, professional botanists, field trip leaders, etc. In the three years, over 170 records were submitted to ACIMS for 95 different rare species and almost 40 specimens submitted to herbaria.

In 2009, 23 volunteers contributed 72 records to ACIMS for a total of 44 different rare species, and submitted 18 specimens to herbaria. See Appendix 4.

In 2010, 8 volunteers contributed 64 records to ACIMS for a total of 24 different rare species, and submitted 4 specimens to herbaria. See Appendix 5.

In 2011, 10 volunteers contributed over 35 records to ACIMS for a total of 27 different rare species, and submitted 16 specimens to herbaria. See Appendix 6.

4.2. Training Workshops

At the start of each field season in early to mid-May of each year, training workshops were held for new and returning volunteers to provide the information, skills and tools necessary for rare plant surveys and collection. At this field event and others planned throughout each field season, volunteers learned about rare plant identification and the collection of plant specimens, planning access and field trips, survey methods,

standardized data collection methods, use of GPS units and topographic maps, and field safety.
In 2009, two training events were held, one at the Devonian Botanic Garden near Edmonton at the end of April and a second at Medicine Hat College in May. A total of 42 volunteers participated in the two events. In 2010, one training workshop was held at the University of Calgary with 17 volunteers in attendance including 12 new volunteers. A field event was held the following day to search for rare plants at Nose Hill Park led by Dana Bush and under the guidance of several experienced botanists. The group learned about map reading, GPS use and using survey transects. Volunteers surveyed part of a large coulee searching for waterpod (*Ellisia nyctelea*), last reported in 1949. Although appropriate habitat still existed, no plants were found. In 2011, two training workshops were held in May, one in Calgary with 30 participants and one in Edmonton with 13 participants.

4.3. Wrap-Up Events

At the end of each field season, wrap-up events were organized in at least two locations, usually Calgary and Edmonton areas, to recognize APA volunteers for their contributions over the year, to celebrate successes and to share stories and interesting finds. The wrap-up events provided volunteers an opportunity for a debriefing of the field season and an evaluation session to provide feedback to the Steering Committee on successes and program improvements. Volunteers also returned their data collection packages, herbarium specimens and loaned equipment.

4.4. Conservation and Stewardship: Events and Activities

In each field season in 2009, 2010 and 2011, several conservation and stewardship group events and activities were held. An overview of the events in each year is presented in this report. Most of the group events were organized by APA or in collaboration with partners such as NCC. Rare plant surveys were also conducted by individuals and smaller group excursions organized by APA volunteers for specific areas. APA volunteers donate their time and travel thousands of kilometres to complete their work.

APA volunteers collected population/distribution data on high priority rare vascular plants, bryophytes, and lichens. Volunteers 'adopted' one or more priority species on which they focused their efforts during the field season. In addition to working on their own, volunteers helped out with group field events organized to assist plant species at risk recovery teams or resource managers with surveys and/or implementation of habitat stewardship activities such as weed control, inventories, and protection from herbivory. Examples include the annual Western Spiderwort Monitoring and Habitat Stewardship with Alberta Environment and Sustainable Resource Development, Western Blue Flag Population Inventory with the MULTISAR Program and the Tiny Cryptantha and Small-flowered Sand Verbena Monitoring and Habitat Stewardship with Alberta Environment and Sustainable Resource Development and Medicine Hat College.

4.4.1. 2009 Events and Activities

In 2009 APA volunteers who conducted rare plant survey work throughout the summer completed 72 rare plant observation records, which were submitted to ACIMS, and collected 18 specimens, which were submitted to herbaria.

Hare-footed Locoweed (*Oxytropis lagopus*) Targeted Survey 2009
In May 2009 a two-day targeted survey for hare-footed locoweed (*Oxytropis lagopus*) was conducted at a site south of Ross Lake and a resurvey of a known site in the Milk River Ridge area east of Del Bonita. Leader Dana Bush and 6 volunteers assisted with the survey. Conditions were cold and late in the spring of 2009, and only a total of 12 species were in flower at the time of the survey, and only 8 *Oxytropis lagopus* plants were found in flower along an east-west ridge, where up to 1000 plants had been reported in 1993. After extensive searching in 2009, the conclusion was that the weather was too cold and the plants had stayed dormant. This type of survey is important and observations need to be tracked annually to be able determine if the population is declining or naturally fluctuating.


Photo: APA.

An example of identification tools provided to volunteers to assist with rare plant surveys:

Example: Concordance Table for Locoweeds Found with Hare-footed Locoweed

	Oxytropis lagopus	***Oxytropis sericeus***	***Oxytropis viscida***
	Hare-footed locoweed	Early yellow locoweed	Viscid locoweed
Flower	Pink-purple or blue-purple, 5-18 flowers	Pale yellow to ochroleucous (cream-coloured), 6-27 flowers, calyx pubescent with dark and pale hairs	Blue-purple, yellowish at base, with sticky yellowish glands on pods, calyx and bracts, 3-20 flowers
Leaves	3-11 cm long; leaflets 5-17, ovate to oblong-elliptic, involute (edges inrolled) or with elevated margins 3-15 mm long, silky-pilose with long silvery hairs	4-30 cm long; leaflets 11-17, opposite or subopposite, oval to oblong-lanceolate, grey or silvery pilose (long soft straight hairs)	3-23 cm long; leaflets 19-35, subopposite, lanceolate or narrowly elliptic-lanceolate, 8-15 mm long, glandular and sparsely hairy
Stipules	Membranous, densely silky-pilose (long soft straight hairs) dorsally, sometimes glabrate (hairless) in age	Pilose (long soft straight hairs) dorsally, the free blades hispid (bristle-like) to ciliate (marginal fringe of hairs)	Membranous, pale, densely pilose (long soft straight hairs) to glabrate (hairless) dorsally, the margins ciliate
Pods	Erect, silky-pilose, shortly stipitate (short stalked), exserted (projecting) from the calyx, 6-15 mm long, chartaceous (stiff writing paper or parchment or submembranous	Oblong, beaked, short-hairy, the wall coriaceous (leathery) and rigid at maturity	Oblong-ellipsoid, hairy, beaked, 8-12 mm long, membrano-chartaceous (stiff writing paper or parchment)

Source: D. Bush, 2009

Botany Alberta 2009

Botany Alberta, the annual botanical blitz organized by the Alberta Native Plant Council (ANPC) in partnership with Nature Conservancy of Canada (NCC) and Adopt-a-Plant Alberta (APA) was held in June 2009 in the Waterton Front area. A total of 60 people attended the event, including 45 volunteer participants, 12 of which were APA volunteers. The rare plant surveys and activities concentrated on the NCC's Palmer and Marsh Properties and Waterton Springs Campground and were led by Ed Karpuk ANPC and Renny Grilz, NCC. Four groups of volunteers travelled different survey routes to complete a rare plant survey of the Palmer and Marsh properties on first day, followed by a survey of the campground property on the morning of the second day. The event was led by several volunteer professional botanists and supported by APA and NCC staff. APA volunteers were provided with the opportunity to work with professional and other amateur botanists in identifying and recording observations of several rare plants.

Photo. H. Blakely.

Western Spiderwort (*Tradescantia occidentalis*) Monitoring and Stewardship 2009

In July 2009, a two-day monitoring and weed removal event was held at Pakowki Lake Sandhills. Leader Lisa Matthias (ESRD) and 8 volunteers including 2 ESRD staff participated in the event. The volunteers carried out intensive monitoring for a subsample of western spiderwort patches to track population size, changes to patch edges, browsing, and phenology. The main weed target was baby's breath (*Gypsophila acutifolia*), and the group confirmed that the plants did not re-grow from the spots where they were removed

in 2008. A total of 48 baby's breath plants were dug up and removed from spiderwort habitat at the front line of the invasion, along with other invasive species (crested wheatgrass and other infestations). The source of the baby's breath was also confirmed. Volunteers conducted meandering searchers for spiderwort and gathered information on flowering phenology for both spiderwort and baby's breath. They also identified a number of locations of *Shinnersoseris rostrata* (annual skeletonweed), a rare/'may be at risk' plant species, which was submitted to ACIMS. Some incidental wildlife observations (e.g., ferruginous hawk, loggerhead shrike, Sprague's pipit, oriole) were also noted and submitted to the ESRD Fish and Wildlife database.

Photo: L. Matthias.

Western Blue Flag (*Iris missouriensis*) Targeted Survey 2009

In June and July 2009, targeted surveys as part of the 5-year provincial survey for *Iris missouriensis* were conducted at various locations in southern Alberta, including the Police Outpost Provincial Park, Boundary School, and Banff sites. Led by MultiSARs contractor Reg Ernst, 5 volunteers participated in the surveys. Heather Dempsey of Parks Canada assisted with the Banff National Park survey.

Tiny Cryptantha (*Cryptantha minima*) Targeted Survey and Stewardship 2009

In July 2009 at Ranchlands Environmental Reserve in Medicine Hat, a resurvey of a 1 ha survey plot established in 2007 was conducted for *Cryptantha minima*. Leader Ron Linowski (Medicine Hat College) and 5 volunteers assisted with the survey and weed

removal. Six tiny cryptantha plants were recorded in the survey area. Volunteers also dug and removed several baby's breath from native prairie habitat adjacent to the survey area.

Fort McMurray (Northern) Rare Plant Survey 2009
In August 2009, a two-day field event to conduct rare plant and lichen surveys was held in the Fort McMurray area (north of city, Maqua Lake, Mariana Lake). Leaders Robert Gray, Janet Marsh and Leslie Monteleone, and 9 volunteers participated in the event. The surveys were conducted at several locations including reclaimed pipeline and oil sands sites, natural forest and wetlands areas. The group documented several plants, lichens and mosses, including a few rare plants such as rare fox sedge (*Carex vulpinoidea*) and rare S1-ranked mountain club-moss (*Huperzia selago*). They also surveyed an area with Mingan grape fern (*Botrychium minganense*) and moonwort (*Botrychium lunaria*).


Photo: J. Marsh.

Soapweed (*Yucca glauca*) Monitoring and Stewardship 2009
In September 2009, a one-day field event was held at the Pinhorn Grazing Reserve to help maintain and evaluate effectiveness of fencing and cages installed around the Pinhorn soapweed population. The Pinhorn Grazing Reserve has one of two naturally occurring soapweed and yucca moth populations in Canada. Three concurrent surveys were conducted utilizing three separate crews: six students from Medicine Hat College led by their instructors Cathy Linowski and Dinesh Mategaonkar conducted surveys inside three large exclosures; another group of APA volunteers surveyed soapweed plants

not in cages, and the remaining volunteers recorded the condition of the range cages and conducted a survey of enclosed soapweed. The event was led by Robin Gutsell (ESRD) and the APA Program Coordinator. The survey assessed the effectiveness of exclosures and cages in preventing seed browsing, recorded seed production and looked for evidence of the Yucca Moth (*Tegeticula yuccasella*) emergence holes.

Photo: C. Linowski.

4.4.2. 2010 Events and Activities

In 2010 APA volunteers who conducted rare plant survey work throughout the summer completed 64 rare plant observation records, which were submitted to ACIMS. A total of 4 rare plant specimens were submitted to herbaria.

Hare-footed Locoweed (*Oxytropis lagopus*) Targeted Survey 2010
In May 2010 a three-day targeted survey for hare-footed locoweed (*Oxytropis lagopus*) was conducted at the Milk River Ridge area east of Del Bonita. Leader Dana Bush and 10 volunteers visited several known sites and searched for new occurrences. Survey work resulted in two known sub-populations being extended and one new sub-population found. Unlike the 2009 survey, a significant number of *Oxytropis lagopus* plants were in bloom at the time of the survey.


Photo: D. Fleury.

Western Blue Flag (*Iris missouriensis*) Targeted Survey 2010
In June 2010, an inventory of a population of *Iris missouriensis* located south of Cardston was conducted. Led by Elizabeth and Kathryn Podgurny, two other volunteers

participated in the inventory. This work was conducted in support of MultiSAR's effort to reassess the western blue flag management plan for one of their partner properties. In July 2010, a survey of *Iris missouriensis* sites located in Banff National Park was conducted by Heather Dempsey, Parks Canada.

Photo: H. Blakely

Botany Alberta Border Cross 2010

In July 2010, ANPC, Adopt-a-Plant Alberta, and Nature Conservancy of Canada (NCC) were invited by the Native Plant Society of Saskatchewan for Botany Alberta Border Cross event at Cypress Hills Inter-Provincial Park (CHPP). A total of 53 people attended the event, including 45 volunteer participants. An over-abundance of mosquitoes and water, especially on local washed out roads and under tent platforms, presented some of the challenges for this botanizing weekend. Plant inventory lists were checked off at 2 NCC properties near Elkwater, Alberta on the first day. On the second day, the Alberta contingent joined the Saskatchewan Native Plant Society group of approximately 50 persons at the Visitor Information Centre in the Centre Block of CHPP, SK, for two hikes, one in the fescue prairie and one in the lodgepole pine (*Pinus contorta*) forest. Plants observed and /or keyed out were checked off or added to the Saskatchewan CHPP checklist. On the third day one group of volunteers visited Old Man on His Back Prairie Heritage Conservation Area and Interpretive Centre southeast of Consul, SK, where a

hike and interpretive events were held. On the Alberta side of CHPP, a group of 11 APA volunteers spent the morning learning about 22 commonly occurring lichens, mostly on lodgepole pine and white spruce (*Picea glauca*), which occur along the Beaver Creek trail in Elkwater.

Photo: D Fleury.

Western Spiderwort (*Tradescantia occidentalis*) Monitoring and Stewardship 2010

In July 2010, a two-day monitoring and weed removal event was held at Pakowki Lake Sandhills for western spiderwort. Leader Lisa Matthias (ESRD) and 5 volunteers participated in the event. The volunteers set up and collected baseline data for six western spiderwort monitoring transects. Vegetation cover counts were conducted and plant counts for western spiderwort plants were done including assessments for each plant for phenological state, number flowers/buds/expired buds, herbivory, and other notes. Volunteers hand dug and removed 8 baby's breath plants (*Gypsophila acutifolia*) and other invasive species encountered in the area. They also re-visited the source of the baby's breath and confirmed that it had been treated with herbicide by the county. Incidental wildlife observations were recorded and volunteers documented occurrences of 2 rare plant species. It was an extremely rare flood year with numerous waterbirds, waterfowl and amphibians near the spiderwort habitat.

Photo: L. Matthias.

Tiny Cryptantha (*Cryptantha minima*) Targeted Survey and Stewardship 2010
In July 2010 at Ranchlands Environmental Reserve in Medicine Hat, volunteers developed a document protocol and conducted a survey for tiny cryptantha occupancy, and developed an annual reporting format. Led by Ron Linowski (Medicine Hat College), several volunteers assisted with the monitoring and occupancy survey. Volunteers also controlled and removed invasive weeds, mainly baby's breath (*Gypsophila acutifolia*) from the survey site by hand digging and pulling.

Lesser Slave Lake Provincial Park Rare Plant Survey 2010
In July 2010, a two-day rare plant survey was held at Lesser Slave Lake Provincial Park with the staging point at the Boreal Centre for Bird Conservation. Leaders Leslie Monteleone and Kristin Andersen, and 3 volunteers participated in this event. Volunteers searched for and found Sitka willow (*Salix sitchensis*) growing on the Devonshire Beach area, no easy feat amongst several other species of willow. Also, near Lily Lake,

volunteers provided known population occurrence estimates and new population occurrences of Northern beech fern (*Phegopteris connectilis*).

Photo: K. Andersen.

4.4.3. 2011 Events and Activities

In 2011 APA volunteers who conducted rare plant survey work throughout the summer completed over 35 rare plant observation records, which were submitted to ACIMS. A total of 16 specimens were collected and submitted to herbaria.

Tiny Cryptantha (*Cryptantha minima*) Targeted Survey and Stewardship 2011

As part of the ongoing monitoring of the Ranchlands- Medicine Hat population of tiny cryptantha, Ron Linowski and Cathy Linowski led a survey on May 20, 2011, joined by Candace Neufeld of Environment Canada and two of her staff. The survey was targeted in the area where in prior years populations of tiny cryptantha had been documented and specific GPS locations were revisited to determine reoccurrence of any plants. While a small fragment of a previous year's plant was located, there were no new plants discovered. Possible explanations for the lack of tiny cryptantha include a particularly cool and wet spring impacting germination; extensive overgrowth of weeds such as kochia in the previously known tiny cryptantha locations; lack of ground disturbance by

road grading associated with prior population concentrations. A second visit to the Ranchlands tiny cryptantha site was carried out the first week of September and survey confirmed the absence of any new plants.

Botany Alberta 2011

In June 2011, Botany Alberta was held in the Cold Lake area, and involved several fieldtrips into unique mineral springs, peat bogs, orchid fens, boreal eskers and intact balsam fir forests. Wet weather did not deter leaders Marsha Hayward and Patsy Cotterill and 23 volunteers, who spent three days conducting rare plant surveys. The first stop was at Tucker Lake, a site being rehabilitated by Husky, and for which APA has assisted with a plant inventory. Other sites included Medley River and North Bay Park. All of these sites provided examples of calcareous springs, rich in iron pigment, with an associated calciphile flora. Where the Medley River enters Cold Lake, volunteers examined populations of the provincially rare broad-leaved arrowhead (*Sagittaria latifolia*). Several other interesting plants, bryophytes and lichens were found in the various habitats.

Photo: H. Blakely.

Western Blue Flag (*Iris missouriensis*) Targeted Survey 2011

In July 2011, a survey of *Iris missouriensis* sites located in Banff National Park was conducted by Heather Dempsey, Parks Canada.

Cardinal Divide and Whitehorse Wildland Park Rare Plant Survey 2011
In July 2011, a two-day rare plant survey field trip was held at Cardinal Divide and Whitehorse Wildland Park. Leader Kristen Andersen and 8 volunteers participated in the event. The first day saw a very successful survey of the alpine flora on the East Ridge. The survey included some rare plants and many unusual alpine plants including one species on the rare list, *Campanula uniflora.* The diversity of plants and rare plants is one of the main reasons this area was originally suggested as an Ecological Reserve, later designated a Natural Area, and eventually becoming part of the much larger Whitehorse Wildland Park. The second day volunteers found another rare species, *Pyrola grandiflora,* a short walk from the Whitehorse Creek campsite, and near the edge of the bluff, at which the coal mine heavy bulldozers had been eating away for their haul road.


Photo: K. Andersen.

Clyde Fen Natural Area Rare Plant Survey 2011
In July 2011, volunteers conducted rare plant surveys at the Clyde Fen, one in early July and another towards the end of July. Leader Kristen Andersen and 4 volunteers from the membership of APA and Stewards of Alberta's Protected Areas Association (SAPAA) participated in the surveys. The Clyde Fen Natural Area remains one of the most unique and ecologically significant peatlands within an hour's drive of Edmonton, and is home to several orchid species, a host of other wildflowers, and countless species of grasses, sedges and rushes. Two of the many plants surveyed were *Malaxis paludosa* (bog adder's-mouth) and *Liparis loeselii* (Loesel's twayblade). Pitcher plants were also found throughout the fen, which is 1 of 6 carnivorous plants known to occur at this site.


Photo: K. Andersen.

Western Spiderwort (*Tradescantia occidentalis*) Monitoring and Stewardship 2011
In July 2011, a monitoring and weed removal event was held at Pakowki Lake Sandhills for western spiderwort. Leader Lisa Matthias (ESRD) and 5 volunteers participated in the event. Volunteers collected detailed phenological information on over 600 plants in 6 permanent transects. They also set up walking transects through potential habitat to see if they could find new areas of spiderwort, and successfully found several new patches of western spiderwort, including a significant new subpopulation over 2 km west of the previously westernmost extent of the population. Another new patch about 200 metres south of the previously south-easternmost patch was also identified. This effectively doubles the span of the entire population in Alberta. Volunteers also removed and disposed of 18 baby's breath (*Gypsophila acutifolia*) and other invasive species from western spiderwort habitat and re-visited the source of the baby's breath and documented re-growth. Volunteers also recorded incidental wildlife and rare plant observations from the spiderwort area.

Plateau Mountain Ecological Reserve Rare Plant Survey 2011
In August and September 2011, three rare plant surveys on three different dates were conducted at the Plateau Mountain Ecological Reserve, which is a nearly-flat high elevation plateau in the frontal range of the Canadian Rockies. As this site was spared glaciation during the last ice age it has some amazing flora, fauna and geological features

including a number of rare liverworts, bryophytes, lichens and vascular plants. Leader Heide Blakely and 11 volunteers surveyed several rare plants, bryophytes and lichens including several groupings of *Campanula uniflora* (alpine harebell) in bloom, *Pinus albicaulis* (whitebark pine), *Pedicularis flammea* (flame coloured lousewort) and *Lewisia pygmaea* var. *pygmaea* (dwarf bitter-root). Other rare plants such as *Draba porsildii* (Porsild's whitlow grass) and *Erigeron lackschweitzii* (front-range fleabane) remained elusive. Volunteers also discovered a rare moss *Brachytheciumn plumosum*, a rare lichen *Hypogymnia metaphysodes* and a rare liverwort *Athalamia hyalina*.

Photo: D. Fleury.

Soapweed (*Yucca glauca*) Monitoring and Stewardship 2011

On October 1, 2011 Cathy Linowski along with ten students and two other Medicine Hat College instructors travelled to the Pinhorn Grazing lease on the Milk River, for the third year in a row, to carry out a survey of the yucca (soapweed) population including data collection on evidence of emergence holes for the Yucca moth. Students monitored large multiplant range exclusion cages, individual plant range exclusion cages and uncaged plants. Survey findings indicated that there was a significant increase in the number and distribution of moth emergence holes; increased number of flowering stalks – especially within most of the large range exclusion cages; evidence of expansion of the plant distribution outside of the cages; and numerous juvenile plants located at some distance from mature plants suggesting origination from seeds rather than vegetatively by cloning. The easternmost large range exclusion cage recorded a decrease in flowering and production of clones in contrast to the other cages on the site. It is noted that the easternmost yucca population within the range exclusion cage is associated with an extensive and healthy population of *Calamagrostis longifolia*. Other yucca populations

and plants are not in competition with the extensive rhizome system of *C. longifolia* and this may be contributing to the reduced vigor and reproductive success of the eastern cage population of yucca.


Photo: C. Linowski.

4.4.4. APA Rare Plant Study Groups

Adopt-a-Plant Alberta rare plant study groups are run by volunteers for volunteers. The aim is to provide training and information on rare plants and their identification in the field. These winter workshops are run in part to help botanists to keep a hand in during the winter and to allow professionals and amateurs to share knowledge to further the cause of rare plants in Alberta. Workshops focus on the identification of rare vascular plants, bryophytes and lichens. Each month, specific plants are studied using keys, herbarium specimens and the shared knowledge of experienced botanists. Leslie Monteleone initiated the first rare plant study group in 2009 and by 2011 there were three groups across the province.

Southern Alberta Rare Plant Study Group
The Southern Alberta Rare Plant Study Group study group is arranged by Leslie Monteleone and has been running since October 2009. Meetings are held monthly from October to April in the University of Calgary Herbarium.

Central Alberta Rare Plant Study Group
The Central Alberta Rare Plant Study Group Rare Plant Study Group is arranged by Kristen Andersen and has been running since January 2011. Meetings are held monthly from October to March in the University of Alberta Herbarium.

Medicine Hat (SE Alberta) Rare Plant Study Group
The Medicine Hat (SE Alberta) Rare Plant Study Group is arranged by Cathy Linowski and has been running since November 2011. Meetings are held monthly from October to April in the Medicine Hat College Herbarium.

4.5. Communications

From 2009 to 2011, APA published several articles, reports, and education and communication materials. The program and its field activities were advertised throughout the year on the APA web site and via email, posters, brochures, articles, and radio. APA volunteers regularly contributed articles to ANPCs Iris Newsletter. An article profiling APA activities was published in the Alberta Sustainable Resource Development InterViews Newsletter, October 2009. A communication poster describing the APA program information and volunteer opportunities was distributed to various organizations, such as Nature Alberta and others, to assist with awareness and volunteer recruitment.
An information pamphlet "*Baby's Breath – a threat to Alberta's prairie plants at risk*" was produced describing baby's breath and where it occurs, outlining the ecological impact of baby's breath on native grasslands, and highlighting what people can do to help prevent and control invasion, especially to florist shops and funeral homes. 500 copies of the pamphlet were printed and distribution in May 2010. Distribution of the baby's breath pamphlet produced by this project will help to raise awareness about the impact of baby's breath and other invasive species on the habitat of native plants.

The APA website, originally hosted through the University of Calgary, was available for volunteers and in 2009 a chat forum was developed. In 2011, Dr. Peter Whitehead (Cape Ecology) volunteered to take on the APA webmaster role. He created a new design and look for the website, transitioned the website to an independent APA domain and improved the interface with up-to-date, user-friendly technology. The website provides information about APA, committees and sponsors and lists upcoming events and excursions with direct links to register. Materials, tools and resources are available for volunteers, as well as links and contact information. The website is a valuable tool for APA volunteers and sponsors, and to encourage new volunteer recruitment. The website is: http://www.adoptaplantalberta.com/

APA has also published several reports between 2009 and 2011. In 2009, APA published the Alberta SAR Report No. 128: *Adopt-A-Plant Alberta: Implementing Recovery Actions for Western Spiderwort (*Tradescantia occidentalis*).*
(Peters et al. 2009)

In 2010, APA published a report entitled "*Adopt-a-Plant Alberta: A Volunteer-based Conservation Initiative for Rare Plants and Lichens, Program Summary 2005–2008*". (Kissner 2010)

In March 2012, drafts of two additional reports were completed, which are planned for publication in spring 2012. One report is the second APA summary report, *Adopt-a-Plant Alberta: A Volunteer-based Conservation Initiative for Rare Plants and Lichens, Program Summary 2009–2011* and the second is an update on the western spiderwort recovery, *Adopt-a-Plant Alberta: Implementing Recovery Actions for Western Spiderwort* (*Tradescantia* occidentalis*) 2009-2011*.

4.6. New Direction for APA

In April 2010, a *Feasibility Study - Enhancing Adopt-a-Plant Stewardship of Plant Species at Risk* was completed for internal use by the APA Steering Committee (SC) and APA Program. The overarching goal of this project was to explore how Adopt-A-Plant Alberta could become more effectively involved with stewardship of plant species at risk in Alberta, under the auspices of the Habitat Stewardship Program (HSP). The objectives were to identify and explore the potential for expanding activities to include structured program surveys for plant species at risk and stronger partnerships with other agencies. The project examined the existing and potential capacity of APA for carrying out this additional work, identified program funding requirements, and summarized the opinions of the APA Steering Committee (SC) and the Alberta Native Plant Council (ANPC) for a preferred future direction for the APA program.

The APA SC and ANPC representatives concluded that the core of the APA program needed to be about volunteers getting involved in rare plant conservation, and that collecting information on rare/may be at risk but not-yet-listed plants was an extremely important gap that needs to be filled in Alberta. APA also feels that organized group events are quite successful, and wanted to build on that success. In 2011, the emphasis moved from intensive training workshops designed to equip volunteers to conduct rare plant surveys on their own, to a more graduated program where new volunteers were introduced to rare plant identification and then encouraged to attend several group events to learn skills and gain confidence. APA continued to provide logistical support for more experienced plant adopters who planned and conducted their own rare plant searches.

APA remains very interested in all aspects of plant species at risk conservation and stewardship, but does not at this time have the capacity to expand its program. Monitoring and stewardship activities will still be conducted for SARA-listed species. APA will focus on species where monitoring protocol and stewardship activities have been clearly identified or APA is working closely with recovery teams or other agencies (i.e., western spiderwort, western blue flag, tiny cryptantha). APA will not at this time take on the development of monitoring protocol and reporting formats, or management prescriptions (i.e., Yucca, Porsild's bryum). APA will continue to work with NCC and MULTISAR including providing training opportunities and conducting rare plant survey field events on NCC property.

5. SUMMARY

From 2009 to 2011 over 100 volunteers participated in APA. The APA project has successfully contributed over 170 records to ACIMS, identified 95 rare plant species and submitted over 20 specimens to herbariums.

Overall, the project has resulted in additional data for a number of Alberta's rare plants, improved stewardship of several plant species at risk, and a growing group of knowledgeable and enthusiastic volunteers interested in conserving Alberta's rare plants and their habitats. Distribution of the baby's breath pamphlet produced by this project will help to raise awareness about the impact of baby's breath and other invasive species on the habitat of native plants.

The success that the APA program has achieved so far would not have been possible without the commitment of its volunteers. It is the volunteers out in the field documenting rare plants and completing stewardship activities that make the APA program work. But they are also supported by a host of other volunteers that play a vital role, volunteering their time to coach at workshops, lead field events, verify specimens, provide maps of rare plant search areas, maintain the APA website, and many other efforts. All APA volunteers bring valuable experience, knowledge, and energy to the program.

Citizen-science projects, like APA, are a relatively inexpensive and effective way to provide critical data for the assessment and protection of species at risk. At the same time, this program increases Albertans' ecological knowledge and awareness/stewardship of their natural environments. Furthermore, by providing the data to ACIMS, it is available to industry and other land users for "flagging" the location of rare species, and hopefully to encourage them to conserve these locations until enough population/distribution data is available to indicate whether the species warrant legal protection. APA is recognized as an organization that can be called upon to provide expertise, enthusiasm and support for stewardship of rare plants in our province.

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7. APPENDICES

Appendix 1. APA Priority Species of Vasculars, Lichens and Bryophytes, 2009-2011.

Species - Vascular
Carex aperta
Carex lacustris
Carex nebrascensis
Carex vesicaria
Cryptantha minima
Dryopteris cristata
Entodon schleicheri
Erigeron trifidus
Halimolobos virgata
Iris missouriensis
Malaxis paludosa
Oxytropis lagopus
Pinus albicaulis
Pinus flexilis
Polygala pauciflora
Salix raupii
Tradescantia occidentalis
Tripterocalyx micrantha
Woodsia glabella

Species - Lichens
Dermatocarpon moulinsii
Flavopunctelia soredica
Peltigra horizontalis
Physconia enteroxantha
Psora himalayana
Ramalina sinensis
Umbilicaria hirsuta

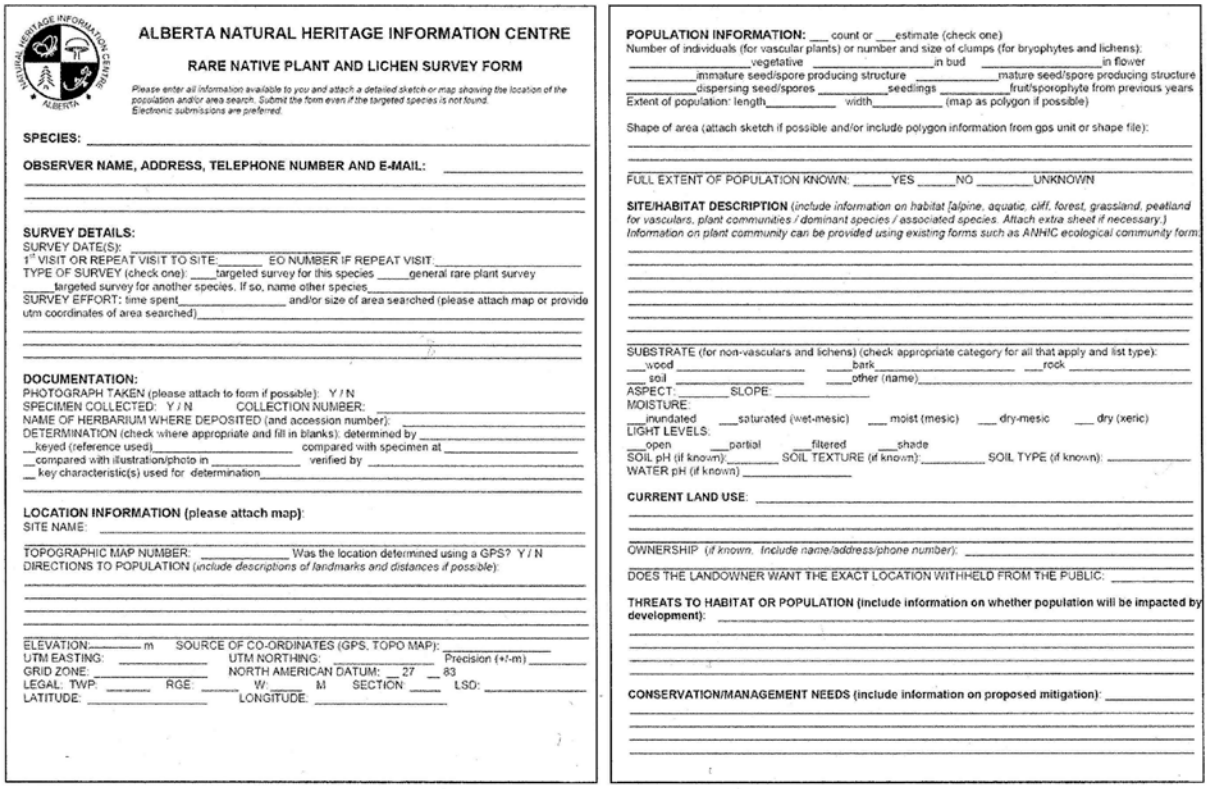
Species - Bryophytes
Bryum porsildii
Callicaldium haldanianum
Entodon schleicheri
Leskea polycarpa

Appendix 2. Example of a rare species plant summary form presented to APA 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.	
Cody, W.J. 2000. Flora of the Yukon Territory. 2nd ed. NRC Research Press, Ottawa. p. 44. Kershaw, L., J. Gould, D. Johnson, and J. Lancaster. 2001. Rare Vascular Plants of Alberta. University of Alberta Press, Edmonton, AB and Natural Resources Canada, Canadian Forestry Service, Northern Forestry Centre, Edmonton, AB. Moss, E. 1983. Flora of Alberta. 2nd Ed. Reviewed by J.G. Packer, University of Toronto Press. Illustration from: Klinkenberg, B. (Editor) 2007. E-Flora BC: Electronic Atlas of the Plants of British Columbia www.eflora.bc.ca . Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver. Flora of North America; Vol. 2. www.eFloras.org	

Appendix 3. Rare native plant and lichen survey form provided by ACIMS. Note: ACIMS currently prefers the use of a digital spreadsheet of this form.

http://www.tpr.alberta.ca/parks/heritageinfocentre/plants/vascularbryophytes/default.aspx



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. 2009 List of Species Recorded and Data Submitted to ACIMS

Species - Vascular

Asclepias ovalifolia
Allium geyeri
Alopecurus alpinus
Botrychium minganense
Boykinia heucheriformis
Calochortus apiculatus
Campanula uniflora.
Carex adusta
Carex backii
Carex houghtoniana
Carex lanuginosa
Carex retrorsa
Carex stipata
Carex vulpiniodea
Chrysosplenium iowense
Conocephalum conicum
Corallorhiza maculata
Corallorhiza striata
Hudsonia tomentosa
Huperzia selago
Hydrophyllum capitatum
Isoetes echinospora
Liparis loeselii
Listera borealis
Malaxis paludosa
Melanelia olivacea
Najas flexilis
Nymphaea tetragona
Oxytropis lagopus
Plantago Maritima
Pedicularis flammea
Physostegia ledinghamii
Pinus albicaulis
Pinus flexilis
Polygala paucifolia
Potamogeton praelongus
Prenanthes sagittata
Sagittaria latifolia
Triglochin maritimaarrowgrass
Vaccinium ovalifolium
Viola pallens
Woodsia glabella

Species – Lichens
Psora himalayana

Species – Bryophytes
Selaginella wallacei or densa

Species - Liverworts
Conocephalum conicum

Appendix 5. 2010 List of Species Recorded and Data Submitted to ACIMS

Species - Vascular
Allium geyeri
Cryptantha celeseloides
Cypripedium montanum
Ellisia nyctelea
Lomatium cous
Monotropa hypopitys
Oxytropis lagopus
Phlox alyssifolia
Pinus albicaulis
Pinus flexilis
Prenanthes sagittata
Pterospora andromedea
Ranunculus glaberrimus
Sisyrinchium septentionale

Species – Lichens
Baeomyces rufus
Buellia elegans
Chaenotheca chrysocephala
Lichenomphalia umbellifera
Melanelia disjuncta
Physconia perisidiosa
Psora himalayana
Ramalina sinensis
Umbilicaria americana
Xylographa parallela

Appendix 6. 2011 List of Species Recorded and Data Submitted to ACIMS

Species - Vascular
Campanula uniflora
Cypripedium montanum
Lewisia pygmaea var. *pygmaea*
Liparis loeselii
Malaxis paludosa
Mimulus guttatus
Monotropa hypopithys
Pinus albicaulis
Pyrola grandiflora
Sagittaria latifolia
Sisyrinchium septentionale

Species – Lichens
Acarospora schleicheri
Caloplaca trachyphylla
Mycocalicium subtile
Psora cerebriformis
Psora himalayana

Species - Bryophytes
Brachythecium rutabulum
Conardia compacta
Fissidens grandifrons
Myurella sibirica
M. tenerrima
Orthothrichum pylaisii
Rhodobryum ontariense
Schistidium tenerum
Seligeria donniana

Species - Liverworts
Anastrophyllum minutum
Marchantia polymorpha

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

http://aep.alberta.ca/fish-wildlife/species-at-risk/species-at-risk-publications-web-resources/default.aspx

Thank you!