



CONSERVING BIODIVERSITY THROUGH PARKS CANADA'S VOLUNTEER PROGRAMME

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ABSTRACT

This paper outlines how conservation volunteer programmes contribute to biodiversity protection and conservation in Canada's national parks. An inventory of some of these volunteer programmes is summarized and specific examples of volunteer conservation activities are provided through a case study of Kejimikujik National Park's volunteer programme. Observations from these conservation volunteer initiatives are combined with findings reported in scholarly literature to highlight factors that contribute to successful conservation volunteer programmes. Key outcomes arising from Parks Canada's conservation volunteer programmes include: support of biodiversity conservation, enhanced visitor experience, broadened support for national parks, and the introduction of new ideas and skills by volunteers. Many volunteers participating in these programmes are tourists; the final section of this paper highlights which CBD Aichi Targets these volunteers are assisting Parks Canada to meet.

INTRODUCTION

This paper focuses on how conservation volunteers contribute to conserving biological diversity in Canadian national parks. Lesson from these programmes may be useful to other park agencies seeking to achieve CBD Aichi Biodiversity Targets. Volunteerism in national parks is seen as a powerful means of engaging people in the protection of ecosystems, habitats and species important for conservation, and for endearing the role of protected areas to a country and its citizens (Parks Canada, 2011). This initiative broadens the awareness, understanding, and appreciation of the significance of national parks, and the importance of protecting them. It creates a shared vision for addressing the underlying causes of biodiversity loss, engages volunteers in broad actions that reduce pressures on biodiversity, strengthens partnerships for improving the status of species and ecosystems, and promotes stewardship of natural resources (Parks Canada, 2011).

Researchers studying volunteer conservation in other contexts suggest these types of outcomes are possible. For

example, Thody et al. (2009) found that tern and plover conservation volunteers increased their knowledge and appreciation of threatened and endangered species and expressed an interest in contributing to conservation policymaking and a greater sense of efficacy in contributing to the recovery of legally protected species. McGehee (2002) found that Earthwatch volunteers reported increased post programme self-efficacy, new networks of collaborators, and greater engagement in social movements engaged in environmental protection and related actions. She also found that the challenges overcome and relationships established during Earthwatch volunteering resulted in consciousness-raising amongst participants (McGehee & Norman, 2002). How successful conservation programmes have been conducted by Parks Canada Agency, with the ultimate outcome to promote public awareness and engagement in conservation, is described next.

CANADA'S BIODIVERSITY AND NATIONAL PARKS

Canada plays a particularly important role as a global steward of significant portions of several important world



Red knot conservation in Mingan Archipelago national park. The project involves establishing the health status of the bird, its critical habitat, movement patterns, survival of the young, and energy needs © Parks Canada

ecosystems including about 10 per cent of the world's forests, 20 per cent of the world's circumpolar ecosystems, 25 per cent of global wetlands, and provides about 10 per cent of the world's fresh water supply. The country is home to some of the largest herds of free-ranging caribou in the world, as well as some of the largest world populations of bears, wolves, martens, beavers, lynx and many furbearers. Many of Northern America's migratory forest birds, shorebirds, ducks and geese take up residence in Canada during the spring and summer (NRCAN, 2012). In 2010, an assessment of the status and trend of Canada's biodiversity (Federal, Provincial and Territorial Governments of Canada, 2010) revealed that much of the country's natural endowment remains healthy. A large part of the country's biological diversity exists within an extensive network of protected areas. In the past 15 years, federal, provincial and territorial terrestrial protected areas have increased in number, size, and the diversity of ecosystems represented. In a world of rapid change, national parks are seen as models of environmental stewardship and as an important legacy to be preserved for future generations.

Canada has an extensive system of national parks, 44 as of November 2012, representing 28 of Canada's 39 terrestrial regions. Among the national parks are areas recognized as World Heritage Sites, International Biosphere Reserves, and Mountain Biosphere Reserves. Together, these parks

represent a very tangible and enduring demonstration of Canada's commitment to protecting the environment (Parks Canada, 2009). Through creation of new parks and expansion of existing ones, the area under national parks has increased by 53 per cent since 2003. Negotiations to create new parks in many parts of the country are in progress, some at very advanced stages. The achievements made by Parks Canada in the first decade of the 21st century have been possible due to the active support of the Canadian society through many partnerships. Conservation volunteerism is one important tool which will need to be maintained and broadened to address resource needs for managing Canada's expanding portfolio of protected areas.

ENGAGING CANADIANS IN PARK ACTIVITIES

Parks Canada identifies public engagement as a cornerstone of its policy, planning and management practices to help ensure sound decision-making, public understanding, and opportunities for Canadians to contribute their knowledge, expertise and other resources (Parks Canada, 2010a). The Agency uses many approaches to engage Canadians in the management of its protected places, and in the development and implementation of its future direction.

Parks Canada recognizes volunteers as partners who can make fundamental contributions to heritage protection



School children participating in ecological monitoring projects in different national parks © Parks Canada

and environmental stewardship efforts. Engagement of volunteers is actively promoted to inspire Canadians to step forward and play a role in Parks Canada heritage places. Individual national parks offer exceptional volunteer opportunities as a means of connecting people to national parks and other heritage places.

IMPORTANCE OF CONNECTING PEOPLE TO PARKS

According to a Parks Canada survey (Parks Canada, 2010b), Canadian values towards national parks are strongly linked with visitation. Nearly all Canadians that had visited national parks (95 per cent) strongly felt that national parks are meant to be enjoyed by present and future generations, compared to only 74 per cent of Canadians that had not visited. The majority of Canadian national park visitors (86 per cent) indicated they would miss national parks if they ceased to exist, compared to just 39 per cent of Canadians who had not visited. The survey also showed that visitation leads to stronger support of the National Parks system. Most Canadians (83 per cent) who had visited a national park strongly supported their tax dollars being used to maintain the national park system compared to just over half (52 per cent) of Canadians who had not visited (Parks Canada, 2010b). This survey revealed the importance of facilitating Canadian's visitation of and engagement with Canada's protected areas. Parks Canada believes that this visitation and engagement lead to support from Canadians. Scholarly literature supports this claim. For example, Halpenny (2010) noted that attachment of visitors to Point Pelee National Park in Canada was a strong positive predictor of park-specific pro-environmental behaviours such as volunteering at the park, picking up litter, participating in public meetings about the park, and contributing to personal donation programmes. Ramkissoon (2012) reported similar findings in her study of visitors to Dandenong Ranges National Park in Australia.

METHODOLOGY

This paper describes Parks Canada's volunteer programme. This is accomplished through an overview of the Agency's efforts; park specific activities are illustrated. An exploratory approach (Patton, 2002) was used to document and describe these activities, as no formal inventory of these efforts has been conducted previously. A more detailed case study of Kejimikujik National Park was also conducted – using appreciative inquiry method (Stowell & West, 1991) to identify what was working well. This was combined with a review of literature on nature-based volunteerism to highlight lessons on good practices that may be adapted to other parks in Canada and internationally. Finally, five categories of volunteer activities in Parks Canada protected areas were then evaluated for their contribution to key Aichi Biodiversity goals and targets.

PARKS CANADA'S VOLUNTEER PROGRAMME

Parks Canada's national volunteer programme was established in 1979 to create a standardized and coherent approach across the Agency. Today, the programme that started with a few hundred people, attracts nearly 6,000 volunteers annually, who work on diverse activities throughout the country. This number compares favourably to the 8,000 volunteers that the United Nations Volunteer Programme mobilizes globally every year (United Nations Volunteers, 2012).

These programmes contribute to Parks Canada's vision, *"Canada's treasured natural and historic places will be a living legacy, connecting hearts and minds to a stronger, deeper understanding of the very essence of Canada."* Each park creates volunteer opportunities according to its own objectives and needs; recruits and trains them, and provides direction and supervision within the national policy framework.



High school students participating in ecological restoration in Point Pelee National Park © Parks Canada

THE VOLUNTEERS

Many of the volunteers come from communities surrounding parks; the others come from across Canada, and even from overseas. The parks use many conservation programmes to enhance their volunteer base and to further develop park-based constituencies. Volunteers are selected based on their interests, skills and the opportunities available in parks.

Volunteers include: professionally-trained people; youth who want practical experience before breaking into the job market; students who require volunteer placement hours from their educational institutions; community groups and clubs that offer volunteer time related to their organizational goals; individuals who provide time on behalf of their employer; and individuals and families who want to learn about and spend time in national parks and contribute to the special places they value and appreciate. Numerous studies have examined park-based and conservation-oriented volunteer tourists (e.g., Cassie & Halpenny, 2003; Douglas & Rollins, 2007; Halpenny & Cassie, 2003; Measham & Barnett, 2008; O'Brien, Townsend, & Ebdon, 2010; Ryan, Kaplan & Grese, 2001; Savanick Guiney & Oberhauser, 2009; Wearing & Neil, 2001).

VOLUNTEER ACTIVITIES

Volunteer activities at Parks Canada are developed and implemented within five categories that support the three elements of the Agency's mandate: resource conservation, visitor experience and public education (Parks Canada, 2010). These categories are (i) Research and Monitoring Support, (ii) Special Events, (iii) Host, (iv) Living History and (v) Caretaker Activities. Activities under the Research and Monitoring Support category are research-related tasks such as observation, measurement or computation, and include carrying out resource inventories, wildlife surveys, ecological monitoring, data analysis, mapping, and water quality studies. Activities under the Special Events, Host and Living History categories relate to visitor experience and public education. They include receiving and welcoming visitors, translations/interpretations for foreign visitors, visitor safety, tour guiding, rafting and canoeing patrols, hosting campground visitors, and conducting visitor surveys. Volunteers also participate in Caretaker type of activities such as ecological restoration, species at risk recovery projects, management of invasive species, trail repair and maintenance, and providing administrative support.

This paper demonstrates how volunteer participation in activities associated within the Research and Monitoring Support and Caretaker categories are contributing to the achievement of the Aichi Biodiversity Strategic Goals and Targets (CBD, 2010). While nearly all parks have volunteer programmes, the Kejimikujik National Park programme is used to serve as an example. Appendix 1, which summarizes volunteer conservation activities in other national parks, is provided to highlight the diversity of programmes across the Canadian national park system. Park-specific volunteer activities can be viewed at individual park websites (see www.pc.gc.ca/eng/agen/vol-ben/vol-beno7.aspx). Kejimikujik was selected as a case study because it has an extensive volunteer programme that has contributed strongly to biodiversity conservation efforts in the park. Kejimikujik National Park is located in eastern Canada and protects two areas: the upland interior of the Nova Scotia peninsula and a smaller unit along Nova Scotia's coast.

CONSERVING BIODIVERSITY THROUGH KEJIMKUJIK NATIONAL PARK'S VOLUNTEER PROGRAMME

Kejimikujik National Park exemplifies Parks Canada's vision for volunteer programmes: *"Parks Canada and volunteers share ideas, knowledge, talent and skills to build a legacy for Canada's natural and historic treasures."*



Removing invasive species to restore the Gary Oak ecosystem in Gulf Islands National Park © Parks Canada

By lending a hand, Parks Canada volunteers feel connected, enrich their lives and make a difference" (Parks Canada, 2011, p. 5). The park is an important tourism destination, attracting visitors from the Atlantic region, other parts of Canada, the United States, and abroad. It covers 381 square kilometres of lush woodlands, rivers, still waters and island-studded lakes. Due to ancient geophysical, sea level, and climatic events, Kejimikujik has diverse habitats that teem with wildlife, including bear (*Ursus americanus*), beaver (*Castor canadensis*), coyote (*Canis latrans*), white tailed deer (*Odocoileus virginianus*) and porcupine (*Erethizon dorsatum*). The system supports a large concentration of rare and threatened species that include mammals such as the American marten (*Martens Americana*) and moose (*Alces alces*), reptiles such as the Blanding's turtle (*Emydoidea blandingii*) and Eastern ribbonsnake (*Thamnophis sauritus*), birds such as the piping plover (*Charadrius melodus*) and rusty blackbird (*Euphagus carolinus*), insects such as the Monarch butterfly (*Danaus plexippus*), and plants such as the water-pennywort (*Hydrocotyle umbellata*) (Parks Canada, 2010b).

The park works in partnership within the Southwest Nova Biosphere Reserve Association, the Mersey Tobetic Research Institute, the Bear River First Nations, the Mi'kmaw communities, Bird Studies Canada and Acadia University to sustain a volunteer programme that offers participants unique opportunities to contribute to protecting regional biodiversity while providing outstanding and memorable experiences to visitors. Some of the volunteer activities in Kejimikujik are listed below.

Recovery of the Endangered Blanding's Turtle

Blanding's turtles exist in three small geographically isolated populations and have been listed as endangered under the *Species at Risk Act*. One of the concerns for this long lived (80+ years), slow maturing (20+ years) species is the lack of young adults in the population. This is of particular concern in the population at Kejimikujik where only five young females have been recorded during the last decade. Predation of unprotected nests by raccoons (*Procyon lotor*) poses the greatest threat, and can affect 100 per cent of the nests. Headstarting is a conservation tool that aims to boost turtle recruitment by rearing

hatchlings for the first two years of their life and releasing them back into their natural habitats, avoiding high mortality rates associated with early life stages. An annual volunteer-based nest protection programme that was established in Kejimikujik has been expanded to populations outside the park to engage the public in protecting turtle nests. The volunteer activities include protecting nest sites with predator exclosures, collection of eggs for off-site incubation, captive rearing of hatchlings for two years, and releasing them into the wild. Over 150 turtles were released into the wild since the spring of 2011. The turtles are monitored through radio tracking to determine habitat requirements, distribution and movement patterns. Volunteers restore turtle habitat and clear garbage to keep raccoons away from nest sites. They also reach out to the local landowners to raise the profile of the species to help foster awareness and appreciation for its conservation. In addition, they educate park visitors about the role of national parks in conserving Blanding's turtles and other species. This programme has become very successful and it is now volunteer-driven.

Protecting endangered Piping Plover

The Piping Plover is a small shorebird that has been listed as an endangered species in Canada since 1985. The bird nests on white sandy beaches. In recent years, the number of nesting pairs of Piping Plovers in Nova Scotia has decreased significantly due to habitat disturbance, loss and fragmentation; predation; and development of overwintering grounds. Monitoring plover adults and chicks within Kejimikujik is done to assess population levels and to implement a suite of management strategies focused on protecting and sustaining their numbers. Volunteers track the plovers, protect nesting habitats, create signage, conduct beach surveys, and share messages with visitors on the plight of the species, and the importance of protecting the park's and regional ecosystems and biological resources. They also monitor predators, clean up the beaches and restore habitats for the Piping Plover and other species.

Restoration of the Monarch Butterfly habitat

The Monarch butterfly is a charismatic species that captivates people due to its amazing life history and long distance migration. The Monarch is impacted by habitat loss, and chemical and pesticide use throughout its range. A native shrub, the swamp milkweed (*Asclepias incarnata*), is key to the survival of Monarchs because females lay their eggs only on this plant and caterpillars only eat its leaves. Volunteers in this project encourage

people to plant chemical- and pesticide-free gardens to provide habitats for the Monarch butterflies and other species in areas outside the park. They create awareness in the communities on how to address the underlying threats to the Monarch and the steps to take to improve its conservation status. Improving the habitat for the Monarch enhances the protection of other butterfly and insect species that provide important ecosystem services.

Enhancing the survival of the iconic loon - an indicator of environmental health

The Common loon (*Gavia immer*) is a highly visible water bird, a Canadian icon of wilderness that captivates visitors by its beauty and haunting call. It is widely used as an indicator of the health of lake ecosystems. Concerns have been raised about the health of loons after very high blood mercury concentrations were found in Kejimikujik loons. These levels have been associated with impaired reproduction and altered breeding behaviour in some areas. The Loon Watch initiative, based on similar LoonWatch initiatives across North America, began on 16 lakes within Kejimikujik in 1996. In 2006, the programme was expanded to areas outside the park, where volunteers are trained to observe and record loon activity and breeding success using standardized protocols. The volunteers also monitor other stressors in the environment that affect the health, reproduction, and survival of the loon. These stressors include loss of nesting habitat to human development, loss of eggs to flooding and predation, and human disturbance. The information obtained is used to develop targeted approaches for addressing specific challenges. LoonWatch monitoring by volunteers is conducted across many national parks in Canada including an initiative at Waterton Lakes National Park in southern Alberta where the findings are shared with Glacier National Park in Montana, USA.

Brook trout and aquatic connectivity

The Brook trout (*Salvelinus fontinalis*) is the most popular sport fish in Nova Scotia and the main fish species sought by anglers in Kejimikujik. Brook trout are sensitive to environmental stressors such as habitat degradation, increased water temperature, competition and over exploitation, thereby making it a good indicator species. Aquatic connectivity within and between watersheds has been identified as critically important for the survival of Brook trout and populations of other fish species. Barriers to fish passage, such as dams, badly designed culverts or modifications to the natural stream bed, can significantly reduce the ability of fish to migrate within the watershed,

and can limit accessibility to suitable spawning, feeding, overwintering and summer habitats. Habitat fragmentation is therefore considered to be a significant threat to the integrity of freshwater ecosystems in the region. To help restore connectivity for Brook trout, ineffective crossings on fish bearing streams have been identified in and around Kejimikujik and prioritized for remediation actions. Volunteers are engaged in Brook trout monitoring to establish movements and population trends. They collect data on fishing success, fish size, age and health conditions, fish habitat characterization, stream flow, and water quality. They also assist in the restoration of Kejimikujik's waterways and creating awareness on sustainable fishing practices and the role of healthy and functional aquatic networks.

Management of invasive species

There are several invasive alien species in Kejimikujik. Glossy buckthorn (*Rhamnus frangula*) and the green crab (*Carcinus maenas*) are some of the most problematic species. Introduced to North America from Europe, these species are now established in Kejimikujik and neighbouring areas. They have the ability to exclude other species and dominate a site indefinitely. Volunteers have been assisting in controlling the spread of the glossy buckthorn and restoring previously colonized habitats with native species. Work on the green crab involves the use of specially designed traps to remove these crustaceans. In addition, volunteers help in removing crabs from boats to minimize spreading into new areas. In 2010 for example, volunteers removed about 200,000 crabs from a single area in Kejimikujik. Monitoring and control of invasive species is a very popular volunteer activity from both the national parks perspective and the volunteers' perspective. This activity involves volunteers from a variety of ages and abilities and is a great introduction to conservation issues. The results are tangible and a sense of accomplishment is immediate.

Monitoring threatened and rare plant species

More than 90 species of fascinating plants collectively known as Atlantic Coastal Plain Flora can be found in Kejimikujik and the surrounding areas. Eleven of these, including water-pennyworth, are listed as species at risk, mainly due to shoreline development. Volunteers are involved in shoreline surveys to provide information on species abundance and distribution. By taking simple measurements along the shoreline, volunteers help monitor shoreline change. They are also directly involved in piloting various shoreline-monitoring techniques, including substrate and slope measurements. To monitor



Volunteers check an endangered Blanding's Turtle nest and release hatchlings in Kejimikujik National Park © Parks Canada

long-term trends, the volunteers photograph parts of the shoreline at different times of the year. This data will provide insight into the changing shorelines and the impact it has on the distribution of the Atlantic Coastal Plain Flora.

Other volunteer initiatives in Kejimikujik include monitoring cougar (*Puma concolor*), American eel (*Anguilla rostrata*), salamander (*Plethodon cinereus*), and Eastern ribbonsnake populations. In addition, they support Kejimikujik's special events and the Campground Host Program, where they assist campers and other visitors.

Through these initiatives, the volunteers are taking ownership of these conservation efforts, and have become advocates for the environment and for Parks Canada. In 2011, the volunteer programme in and around Kejimikujik National Park recorded its 1,000th volunteer, and its 100,000th volunteer hour since 2000.

The Friends of Kejimikujik publish the *Volunteers News* – a newsletter that is distributed annually throughout the region, providing updates on volunteer contributions and opportunities for participation around Kejimikujik and the Southwest Nova Biosphere Reserve. They also organize many information and outreach sessions to create awareness of and actions for enhancing biodiversity conservation in the park and the surrounding regions for the benefit of all.

Table 1. Contribution of volunteers to achieving the Aichi Biodiversity Targets.

Aichi CBD Strategic Goal	Aichi Targets Directly Contributed to by Parks Canada's Volunteer Programme	Aichi Targets Indirectly Contributed to by Parks Canada's Volunteer Programme
A. Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society	Increasing awareness of the values of biodiversity and steps to conserve it (1)	Biodiversity values integrated into local development strategies (2)
B. Reduce the direct pressures on biodiversity and promote sustainable use	Reduce rate of loss of natural habitats, biodiversity degradation and habitat fragmentation (5); Control spread of invasive species (9) Anthropogenic pressures on vulnerable ecosystems minimized (10)	Reduce pollution (8),
C. Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity	Prevent extinction of threatened species and improve their conservation status (12)	Support establishment of protected areas (11)
D. Enhance the benefits to all from biodiversity and ecosystem services	Restore and safeguard ecosystems that provide essential services (14); Enhance ecosystem resilience through conservation and restoration (15)	
E. Enhance implementation through participatory planning, knowledge management and capacity building	Respect traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources (18)	Knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied (19)

AN OVERVIEW OF VOLUNTEER ACTIVITIES IN CANADA'S NATIONAL PARKS IN 2011

Volunteer programmes similar to those described above take place in national parks throughout the country. Appendix 1 shows initiatives undertaken in 2011 by volunteers in projects related to resource protection, ecological restoration, ecological monitoring and natural resource stewardship. These activities occurred in 35 national parks involving 1,801 people and 31,483 hours.

The combined skills of the volunteers enhance the capacities of each park, bring in new perspectives and approaches to addressing conservation issues, strengthen implementation of park conservation programmes, and through research and monitoring, help to accelerate the generation of important information for decision-making.

OBSERVATIONS ABOUT THE MANAGEMENT OF VOLUNTEERS IN PARKS CANADA

Taking feedback from managers who engage conservation volunteers at their parks, and in particular Kejimikujik National Park, this next section outlines some of the lessons learned from implementing these programmes. First, understanding volunteer motivations and needs is paramount. Volunteers are driven to fulfil a wide range of

needs; this is shaped by their life stage, personality, socio-economic status, education, occupation history, and so on. A universal motive for volunteering is social interaction. Bell et al. (2008) perhaps describes this best by stating that, "*volunteer satisfaction involves a temporary escape from everyday life into an intense, 'authentic' social world*" (p. 3452). Positive social interactions generate trust, long-term friendships, a safe environment for self-improvement and related benefits (Measham & Barnett, 2008). This social interaction is also linked to some individuals' need to engage in collective action, especially efforts to protect the environment (McGehee, 2002; Ryan, Kaplan, & Grese, 2001; Savanick Guiney & Oberhauser, 2009; Wearing, 2002).

Altruism, a second common motive, varies with each context and volunteer. Managers must be aware of its diversity of focus, and attempt to match volunteers with programmes accordingly. For example, an interest in birds rather than habitat may attract and maintain avian enthusiasts for a longer period of time in a bird sanctuary programme (Weston et al., 2003). Kejimikujik National Park has used the Blanding's turtle very successfully to draw in support. However, a caveat must be noted here that over reliance on 'flagship species' to draw volunteers

has been warned against by some critiques due to the attraction of volunteers who may be unwilling to engage in the conservation of other species and habitats (Cousins et al., 2009; Entwistle, 2000; Simberloff, 1998).

Another motive that is commonly reported by managers and researchers is the desire to increase skills and employability. The skills and experiences gained through volunteering can be leveraged to gain more advanced employment opportunities, or a change in career path (Cassie & Halpenny, 2003; Galley & Clifton, 2004). Conservation volunteerism has also been linked to addressing the needs of occupationally deprived adults, who have experienced social exclusion and mental ill-health due to unemployment (Birch, 2005).

Experiencing wellness and health through engagement in conservation volunteerism is another major motivation. Physical and mental fitness and restoration are often reported to be more readily achieved in nature based settings (Birch, 2005; Hartig, 2001; Lemieux et al., 2012; Savanick Guiney & Oberhauser, 2009). While some programmes associated with conservation volunteering can involve administrative work, by far the greatest draw for volunteers working in parks is an opportunity to interact with nature (Weston et al., 2003). These are just some of the key motives that park managers need to be aware of in attracting and retaining volunteers. Researchers have documented many others including learning (Measham & Barnett, 2008; Ryan, Kaplan & Grese, 2001), adhering to one's values (Campbell & Smith, 2006; Halpenny & Caissie, 2003), pleasure seeking (Caissie & Halpenny, 2003); attachment to a particular place (Halpenny, 2010; Measham & Barnett, 2008), leaving a legacy (Caissie & Halpenny, 2003); identity building and re-shaping (Wearing & Neil, 2000), and fostering a connection with nature (Savanick Guiney & Oberhauser, 2009).

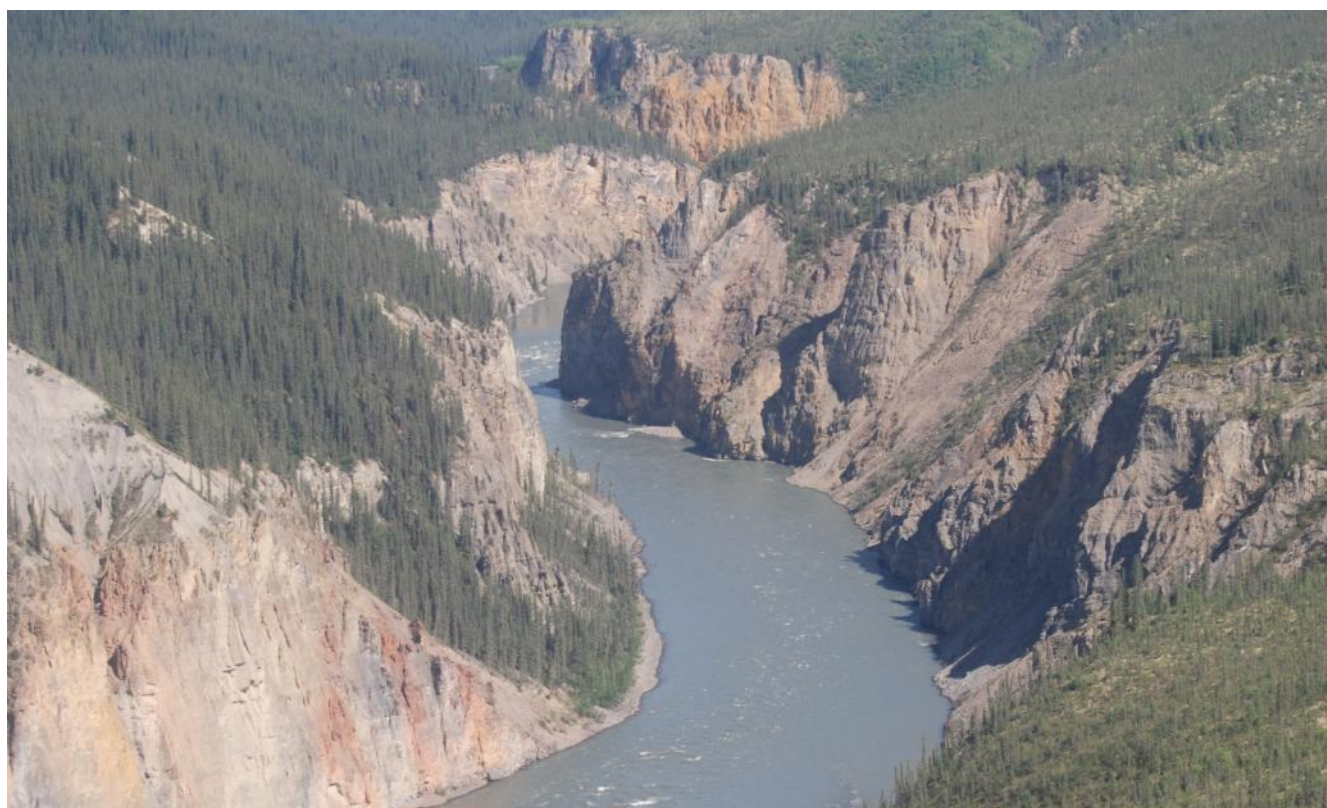
A second major observation taken from Parks Canada's conservation programmes is how volunteer programmes are promoted and delivered. Coghlan (2007) conducted a study that asked potential volunteer tourists to sort volunteer programme brochures. Four types of volunteer organizations were identified. Her main recommendation arising from this was that organizations need to be aware of their perceived images in order to match their volunteers' expectations and needs with appropriate programmes. At a national level, Parks Canada stresses this in the Agency's *Conservation Volunteer Guidelines* (Parks Canada, 2011) and web pages that promote volunteer opportunities.

On this same web site financial assistance and work permit/visa policies are mapped out, setting the expectations of international and local volunteers interested in working in the Agency's parks.

A final set of recommendations derived from Park's Canada's conservation volunteer programmes, and reinforced by scholars, are related to programme structure and character. Structure needs to be flexible, in terms of when and how long volunteers can participate, and the types of activities that volunteers can engage in (O'Brien et al., 2010). High quality training is essential to foster confidence amongst participants, as well as rigor (in the case of citizen science; Cohn, 2008) and safety (Leslie et al., 2004; Weston et al., 2003). Communication is necessary at the beginning of new programmes, in terms of goal setting and sharing, and throughout the initiative. Communication related to supervision and feedback to the participants, especially personal acknowledgement of the volunteer's efforts is deemed to be especially important (Weston et al., 2003).

Volunteer opportunities to develop programme improvements and communicate them to organizers are another key ingredient in maintaining volunteers; this fosters a sense of inclusion, empowerment and respect (Phillimore, 2001). Access to unique opportunities at each park also inspires volunteers to join and remain part of the team (Halpenny & Cassie, 2003). For example at Elk Island National Park, volunteers assist with the round up and inspection of bison; the volunteers can reach out and touch these wild, powerful animals when they are immobilized for medical inspection. Programme leadership, that includes excellent communication and organizational skills combined with scientific expertise, inspires conservation volunteers (Coghlan, 2008; Douglas & Rollins, 2007).

Finally, tangible outcomes are a very important aspect of many volunteer programmes. As noted above, invasive species monitoring and removal in various Parks Canada protected areas is especially popular because volunteers feel and see real results. The data collected from citizen science programmes, while less tangible, is also gratifying to volunteers; however, the data collected must be perceived by volunteers as scientifically valid and contributing to a larger base of knowledge. This has characterized Canada's LoonWatch programme, which generates and shares data collected by volunteers internationally.



Nahanni National Park and World Heritage site © Sue Stoltz

OVERALL VOLUNTEER CONTRIBUTION TO PARKS CANADA'S MANDATE

The volunteer programme provides opportunities to involve Canadians in the management of national parks. This is not only an excellent mechanism of presenting the parks to the public but it also fosters a greater awareness of park and conservation issues in general, creates a greater sense of public ownership of national parks, and increases support for their existence.

The following section summarizes the value added by volunteers:

- i. **Support conservation of biological diversity:** Volunteers participate in conservation projects that address threats and improve the status of biodiversity in parks and neighbouring areas. They also carry out research and monitoring activities that generate knowledge to support management decisions. In addition, volunteers help to cover larger areas, tackle multiple issues and deal with numerous parameters.
- ii. **Enhance visitor experience:** Volunteers contribute to enhancing visitor experience and fostering public education and appreciation of Canada's natural and cultural heritage.
- iii. **Broaden support for national parks:** Volunteers become park ambassadors. They share their passion

with people at home, abroad, and virtually; building the image of the parks and increasing the constituency of volunteers and supporters.

- iv. **Bring new ideas and skills:** Volunteers usually bring creativity, fresh ideals, and new perspectives. Their presence creates a richer, warmer, more enthusiastic environment that provides parks with an increased variety and quality of service.

In some areas, volunteer initiatives have become the backbone of conservation success, as in the case of the recovery of the Blanding's turtle in Kejimikujik National Park. Successes in national parks are a strong motivation for initiating similar efforts elsewhere, providing a template for replication and scaling up.

VOLUNTEER CONTRIBUTION TO MEETING CBD TARGETS

Parks Canada volunteer programme plays a key role in promoting the protection of ecosystems, habitats and species important for conservation, and endearing the role of protected areas to the people of Canada and abroad. Table 1 shows how volunteer activities are contributing, directly or indirectly to achieving the 2020 CBD Aichi Strategic Goals and Targets.

CONCLUSION: CONSERVATION IS A SHARED RESPONSIBILITY

Canada's national parks exist for all Canadians. While Parks Canada plays a custodial role for these special heritage places, fulfilling the protection, education, and visitor experience mandate is a shared responsibility. Volunteerism has become a powerful means of sharing this responsibility. Through this initiative, volunteers are provided with opportunities to better understand, and appreciate their national parks while making valuable contributions to their successful management.

Through their participation, volunteers have inspired other people and helped to create a shared vision and galvanize actions for promoting biodiversity conservation for the benefit of Canadians. Parks Canada will continue to build upon its successful track record of working with volunteers, and looking externally to share best practices and experiences with other organizations.

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Appendix 1: Summary of Parks Canada 2011 Volunteer Conservation Activities

Park	No. of people	No. of hours	Volunteer activities on
Terra Nova	3	231	Otter monitoring
Gros Morne	5	570	Monitoring the health of coastal ecosystems ; monitoring moose, birds, fish, *resource conservation
Cape Breton Highland	3	72	Monitoring coyote, American eel
Kejimikujik	358	7,843	See section above
Fundy	59	586	Monitoring eel, moose count, Christmas bird count, resource conservation
Kouchibouguac	47	2,296	Monitoring, eel, salmon and striped bass. Piping plover recovery project, river flora inventory, Tern survey, Christmas bird count
Prince Edward	42	714	Monitoring plover, bird surveys
Mingan	35	280	Bird survey
Forillon	27	190	Bird survey, American marten, fish, tern colony
St. Lawrence	7	265	Muskellunge habitat and monitoring, Pitch pine restoration, Wetland monitoring
Bruce Peninsula	2	58	Resource conservation
Fathom Five NMCA	4	208	Research on invasive species, Bird count
Point Pelee	178	1,024	Monitoring snakes, frogs, soils, archaeological objects
Pukaskwa	6	1,080	Resource conservation
Lake Superior	1	10	Bird watching
Banff	44	1,750	Research, social science, resource conservation
Kootenay	6	127	Communication, wildlife monitoring, deer collaring
Yoho	9	290	Prescribed fires, wolf monitoring
Lake Louise	113	909	Ecological restoration, vegetation analysis
Jasper	16	821	Resource conservation, amphibian monitoring, caribou counts, aquatic habitat monitoring and restoration
Mt. Revelstoke	8	160	Amphibian and sub-alpine plant monitoring
Waterton Lakes	78	581	Aquatic and bear research, avalanche assessment, weed mapping, butterfly counts, loon survey, resource conservation
Riding Mountain	47	198	Fish and water monitoring, invasive species management, elk collaring and monitoring, resource conservation
Elk Island		1,114	Research and monitoring
Grasslands	39	1,104	Monitoring mormon metalmark, black-footed ferret, sage grouse, bird counts, resource conservation
Ivvavik	12	720	Ecological integrity monitoring
Auyuittuq	2	20	Penny Ice cap research
Quttinirpaaq	1	5	Wildlife regulations
Pacific Rim	499	2,085	Dune and Garry Oak restoration
Gulf Island	10	108	Bivalve sampling, eelgrass monitoring, marine surveys, ecosystem restoration
Gwaii Haanas	13	2,738	Riparian habitat restoration, habitat mapping, vegetation monitoring, bird surveys, visitor surveys
Kluane	16	210	Ecological monitoring, resource conservation
Vuntut	2	82	Peregrine Falcon Survey, resource conservation
Rideau Canal and TSW	109	3,034	Species at Risk recovery projects
Total	1,801	31,483	*Resource conservation includes protection, restoration, management,

RESUMEN

Este documento describe cómo contribuyen los programas de voluntariado en apoyo de la protección y la conservación de la biodiversidad de los parques nacionales de Canadá. Se resume un inventario de algunos de estos programas de voluntariado y se presentan ejemplos concretos de actividades de conservación emprendidas por voluntarios con base en un estudio de caso de un programa de voluntariado en el Parque Nacional Kejimikujik. Las observaciones de estas iniciativas de voluntariado para la conservación se combinan con las conclusiones señaladas en la literatura científica para resaltar los factores que contribuyen al éxito de los programas de voluntariado en apoyo de la conservación. Entre los principales resultados derivados de los programas promovidos por Parks Canada cabe resaltar: el apoyo a la conservación de la biodiversidad, experiencia mejorada para los visitantes, mayor apoyo a los parques nacionales, e introducción de nuevas ideas y habilidades por parte de los voluntarios. Muchos de los voluntarios que participan en estos programas son turistas; la sección final de este documento destaca las Metas de Aichi del CDB a las que estos voluntarios están ayudando a cumplir.

RÉSUMÉ

Ce document souligne dans quelle mesure les programmes volontaires de conservation contribuent à la protection de la diversité biologique et à la conservation dans les parcs nationaux du Canada. Un inventaire de quelques-uns de ces programmes volontaires est résumé et des exemples précis d'activités volontaires de conservation sont présentés par le biais d'une étude de cas, sur le programme volontaire du parc national de Kejimikujik. Les observations tirées de ces initiatives volontaires de conservation sont ajoutées aux résultats rapportés dans les publications scientifiques afin de souligner les facteurs contribuant au succès des programmes volontaires de conservation. Les principales réalisations à imputer aux programmes volontaires de conservation de Parcs Canada incluent notamment : le soutien envers la conservation de la diversité biologique, une amélioration de l'expérience du visiteur, un soutien élargi envers les parcs nationaux et l'introduction de nouvelles idées et compétences par les volontaires. La plupart des volontaires participant à ces programmes sont des touristes. Dans la dernière partie du document, les Objectifs d'Aichi de la Convention sur la diversité biologique visés par Parcs Canada grâce à l'action de ces volontaires sont soulignés.