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Environmental Monitoring in Canada's National Parks, 1994-95

La surveillance de l'environnement dans les parcs nationaux du canada, 1994-1995



1995

Lori Rissling and David Welch

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Les parcs nationaux du Canada sont dédiés à tous les Canadiens. Ils ont été créés à des fins patrimoniales, culturelles et récréatives. Les visiteurs doivent en jouir dans le respect de la *Loi sur les parcs nationaux* et des règlements applicables. Les parcs nationaux doivent être utilisés et préservés de manière à ce que les générations futures puissent continuer à en profiter.

Le présent rapport a fait l'objet d'un tirage limité. Pour de plus amples renseignements, communiquer avec Per Nilsen. Téléphone : (819) 994-2745 ; poste électronique : per_nilsen@pch.gc.ca ; télécopieur : (819) 994-5140. Parcs nationaux, Parcs Canada, 4e étage, 25, rue Eddy, Hull (Québec), Canada K1A 0M5.

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ABSTRACT

Canada's national parks participate in individualized monitoring activities to meet the specific needs of each park. In 1990-91 approximately $1.479 million dollars was spent on monitoring in national parks and canals. In 1992-93 the total cost rose to $2.3 million. This report contains the findings of a 1994 survey which was more comprehensive than the previous two. The survey asked for a list of all current and planned monitoring programs, estimates of costs and related co-operative agreements. Responses from 37 national parks and two marine parks were recorded in a standard format and reviewed by each park's correspondent. Data interpretation focused on three main areas: content, i.e. the subject of the monitoring activities; cost, and co-operative agreements.

A total of 595 monitoring activities were reported. Examples included daily weather monitoring reported at 22 parks, forest insect and disease monitoring at 25 parks, various flying animal and ungulate surveys, and visitor usage impact monitoring. Consistently, the parks' Ecosystem Conservation Plans, current and additional future monitoring plans, and co-operative agreements all focused primarily on studies which were biological in nature while still participating in some physical and cultural monitoring. Approximately 60% of all the monitoring reported was biological, 25% investigated physical phenomena and the remaining 15% included cultural, multi-disciplinary and other monitoring activities. Gros Morne National Park reported the highest number of current monitoring activities, listing 46 projects. The total

RÉSUMÉ

Des activités de surveillance de l'environnement ont lieu dans tous les parcs nationaux du Canada. La nature de ces activités varie d'un parc à un autre. En 1990-1991, environ 1,479 million de dollars ont été consacrés à la surveillance dans les parcs et canaux historiques nationaux. En 1992-1993, cette somme passait à 2,3 millions de dollars. Notre rapport présente les résultats d'une enquête menée en 1994, de manière plus exhaustive que les deux précédentes. Nous avons demandé aux répondants de dresser la liste de tous leurs programmes de surveillance actuels et projetés, d'en estimer les coûts et de décrire les ententes de coopération auxquelles ils participaient. Les réponses provenant de 37 parcs nationaux et de deux parcs marins ont été consignées selon une présentation normalisée et revues par le répondant de chaque parc. L'interprétation des données a porté sur trois points principaux : le contenu, c.-à-d. l'objet des activités de surveillance, les coûts et les ententes de coopération.

Au total, 595 activités de surveillance ont fait l'objet d'un compte rendu. À titre d'exemples, mentionnons les rapports météorologiques quotidiens dans 22 parcs, la surveillance des insectes et des maladies qui affectent les forêts dans 25 parcs, diverses enquêtes aériennes sur les animaux et les ongulés et la surveillance de l'incidence des activités des visiteurs. On constate immanquablement que les plans de conservation des écosystèmes des parcs, les programmes de surveillance actuels et projetés, de même que les ententes de

reported Parks Canada cost of monitoring in 1994-95 was approximately $3.5 million, an increase of $1.2 million since 1992-93. Much of this reported increase was probably due to the more systematic nature of this survey compared to previous ones. Another $1.2 million was contributed through the efforts other agencies.

coopération portent principalement sur des études de nature biologique, sans pour autant omettre complètement la surveillance des aspects physiques et culturels. Environ 60 % de toutes les activités de surveillance portent sur des phénomènes biologiques, 25 % sur des aspects physiques et les 15 % restant sur des objets culturels, multidisciplinaires ou autres. C'est au parc national du Gros-Morne qu'on mène actuellement le plus grand nombre d'activités de surveillance, soit 46. Le coût total des activités de surveillance en 1994-1995 s'élève à environ 3,5 millions de dollars, en hausse de 1,2 million de dollars par rapport à 1992-1993. La majeure partie de cette hausse est probablement imputable à la plus grande exhaustivité de la présente enquête, par rapport aux deux précédentes. Une autre tranche de 1,2 million de dollars est supportée par d'autres organismes.

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We thank all the park, regional and headquarters staff who took the time to complete and assist with the distribution this survey. We were fortunate to have a 100% return rate — a completed survey from every park. We appreciate that this was not easy, given that everyone was busy wrapping up the visiting season at that time. Thanks also to the following parks headquarters staff for their assistance: Suzanne Bessette, Jacques Renaud, Daniel Plasse, André Savoie, Céline Racette and Louisette Simard-Tremblay.

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Nous remercions tous les membres du personnel des régions et de l'administration centrale qui ont pris le temps de répondre à nos questions et qui nous ont aidés à mener notre enquête. Nous avons eu la chance d'obtenir un taux de réponse de 100 % : tous les parcs ont envoyé un rapport, ce qui était beaucoup demander, étant donné que les questionnaires sont arrivés en fin de saison touristique, à un moment où tout le monde était très occupé. Nous remercions aussi les personnes suivantes de l'administration centrale pour leur aide : Suzanne Bessette, Jacques Renaud, Daniel Plasse, André Savoie, Céline Racette et Louisette Simard-Tremblay.

INTRODUCTION

Canada's national parks participate in individualized monitoring activities to meet the specific needs of each park. These studies are influenced by local stresses, management needs, availability of staff and the participation of outside agencies (Welch, 1994). Surveys of national parks' monitoring were done in 1990 and 1992. In 1990-91 approximately $1.5 million dollars was spent on monitoring. In 1992-93 the total cost rose to $2.3 million (Welch, 1994). With the addition of costs to other agencies and universities, allowances for small, unrecorded amounts of time spent on monitoring activities, the cost was probably another million dollars. Individual parks reported as few as one monitoring program to as many as 20 or more. This wide range of monitoring activities was a response to the number of stresses these parks experienced at the time of these surveys, most being park specific.

This report contains the findings of a 1994 survey that is more comprehensive than the previous two. The design and execution of this survey focused on updating previously collected information. The survey had these objectives:

- to inventory monitoring activities in Canada's national parks;
- to update the 1990 and 1992 surveys;
- to gather information on the range of monitoring activities currently ongoing, e.g. the number of parks studying biological, physical or climatic processes;
- to establish the costs of monitoring;
- to identify areas of monitoring strength, and areas of monitoring weakness, and

INTRODUCTION

Des activités de surveillance de l'environnement ont lieu dans tous les parcs nationaux. La nature de ces activités varie d'un parc à un autre. Elle dépend de facteurs locaux comme les contraintes qui s'exercent sur l'environnement, les besoins de gestion, la disponibilité du personnel et la participation d'organismes externes (Welch, 1994). Les activités de surveillance menées dans les parcs ont fait l'objet d'enquêtes en 1990 et en 1992. En 1990-1991, environ 1,5 million de dollars ont été consacrés à la surveillance. En 1992-1993, cette somme passait à 2,3 millions de dollars (Welch, 1994). Si on rajoute les dépenses des autres organismes et des universités et si on tient compte des courtes périodes de temps non comptabilisées au titre de ces activités, les coûts augmentent probablement d'un autre million de dollars. Le nombre d'activités de surveillance menées dans chaque parc varie de une à plus de vingt, en fonction du nombre de facteurs de stress environnementaux subis par un parc au moment de l'enquête.

Notre rapport présente les résultats d'une enquête plus exhaustive que les deux précédentes. Menée en 1994, l'enquête a été conçue et réalisée dans le but de mettre à jour les informations déjà recueillies. Les objectifs de l'enquête étaient les suivants :

- faire l'inventaire des activités de surveillance menées dans les parcs nationaux du Canada ;
- mettre à jour les résultats des enquêtes de 1990 et de 1992 ;
- recueillir des informations sur la nature des activités de surveillance en cours, p.

- to assess the value of partnerships with other agencies.

Primarily through the use of this survey, this study investigates the monitoring activities of Canada's 37 national parks and two national marine parks.

ex. le nombre de parcs qui étudient les processus biologiques, physiques ou climatiques ;
- établir le coût des activités de surveillance ;
- déterminer les points forts et les points faibles de la surveillance ;
- évaluer les collaborations avec les autres organismes.

Le rapport examine les activités de surveillance menées dans les 37 parcs nationaux et dans les deux parcs marins du Canada, en s'appuyant principalement sur les résultats de l'enquête.

METHODOLOGY

The survey data collected for this project was provided by either regional park offices or individual parks' staff. This information was supplemented by data collected through a literature review of park documents at headquarters. The survey was distributed September 1994 at which time the literature review commenced. Appendix I contains a copy of the questionnaire. The literature review focused on references to monitoring in Ecosystem Conservation Plans. This review facilitated the development of the questionnaire sent to the regions and parks.

Parks were asked to report on their current monitoring activities, co-operative agreements, costs and their plans for monitoring in the future. Monitoring, for the purposes of this survey, was defined as any repetitive and on-going measures of variables, according to prearranged schedules in space and time, using comparable methodologies for data collection. However, no judgement has been made as to whether each item submitted truly met this definition. The data reported by the parks were input as received.

Once received, responses from individual parks were recorded in a standard format (see Appendix II). Ambiguous, illegible or suspect responses were confirmed with phone calls. When all the data were in a standard form they were aggregated by subject, by co-operative agreements by subject and by participating agencies, and by costs.

In many instances parks were not able to provide all of the information requested. Generaly this occurred because the parks did

MÉTHODE

Les réponses aux questions de notre enquête ont été fournies par le personnel des bureaux régionaux ou par celui des parcs. L'information a été complétée par des données obtenues à la suite d'une analyse bibliographique des documents conservés à l'administration centrale. Le projet a été lancé en septembre 1994 et a commencé par l'analyse bibliographique. L'annexe I est une copie du questionnaire. L'analyse bibliographique a surtout porté sur les activités de surveillance prévues dans les plans de conservation des écosystèmes. Elle a facilité l'élaboration du questionnaire envoyé aux régions et aux parcs.

On a demandé aux parcs de faire état de leurs activités de surveillance actuelles, de leurs activités projetées, de leurs ententes de coopération et de leurs coûts. La surveillance, aux fins de notre enquête, se définit comme la mesure périodique et permanente de certains paramètres, selon un horaire et dans des endroits prévus, au moyen de méthodes comparables de collecte des données. Nous n'avons toutefois pas vérifié si chaque activité décrite correspondait vraiment à ces critères. Les renseignements fournis par les parcs ont été traités tels quels.

Les réponses des parcs ont été consignées selon une présentation normalisée (voir annexe II). Les réponses ambiguës, illisibles ou douteuses ont été confirmées par un appel téléphonique. Après normalisation de la présentation des données, les résultats ont été calculés par objet, par entente de coopération (objet et organisme) et par poste de dépense.

not have access to such information, or it was not applicable to their situation. For example, the newer parks (such as North Baffin and Vuntut) are not even staffed, therefore detailed monitoring information is not available. Many of the parks could not report fully on the costs of their monitoring programs. This was particularly true regarding the co-operative agreements, where the costs to outside agencies could not be obtained without extensive effort. In these instances, the symbol N.A. (not available) or S/O (sans observation) appears in Appendix II.

Les parcs donnaient souvent des réponses incomplètes, soit parce qu'ils n'avaient pas accès à l'information nécessaire, soit que la question ne les concernait pas. Par exemple, les nouveaux parcs (comme Nord-de-Baffin et Vuntut) n'ont même pas encore de personnel. Aucune information détaillée sur les activités de surveillance n'est donc disponible à leur sujet. De nombreux parcs n'ont pu dresser de rapport complet sur les coûts de leurs activités de surveillance, en particulier lorsque intervenaient des ententes de coopération ; dans ces cas les coûts supportés par les organismes externes ne pouvaient pas être obtenus sans de laborieux efforts. Dans de telles situations, l'indication N.A. (not available) ou S/O (sans observation) figure à l'annexe II.

RESULTS

As is evident from the survey responses, a wide range of monitoring activities exists at Canada's national parks. As was previously found, monitoring activities are most often designed to meet the specific needs of individual parks in response to stresses. Examples include permanent vegetation transects and plots, ungulate surveys to determine population and behaviour, daily fire weather monitoring, forest insect and disease monitoring, and water quality monitoring. Many of the parks also collect visitor statistics using a common methodology where the number of person-entries, person-visits and total person-days are recorded monthly. Two main types of monitoring were reported. *Issue monitoring*, which investigates subjects such as drinking water quality, campfire smoke hazards to human health, diseases in wildlife, and impacts of resort and road building. Normally such programs last for several years until the issue is resolved. In contrast, *research monitoring* is of short duration and provides information on local climate, hydrology, or wildlife and habitat relationships.

Subject results

The survey gathered information based on current and future (additional) monitoring. In each situation, activities were divided into five subject areas. Most monitoring activities fit into one of three main categories,

RÉSULTATS

Les réponses obtenues démontrent clairement que les activités de surveillance varient considérablement d'un parc à un autre. Comme on l'a déjà constaté, les activités de surveillance sont le plus souvent conçues en réponse aux contraintes particulières subies par le parc. À tire d'exemples d'activités, mentionnons l'examen de transects ou de parcelles de terrain, l'étude des populations et des comportements d'ongulés, la surveillance pendant les conditions météorologiques propices aux incendies, la surveillance des insectes et des maladies qui affectent les forêts et le contrôle de la qualité de l'eau. De nombreux parcs produisent aussi, selon une méthode commune, un rapport mensuel sur les activités des visiteurs, qui indique le nombre d'entrées-personnes, de visites-personnes et de journées-personnes. Deux grands types d'activités de surveillance ont été décrits. Les *activités thématiques* portent sur un objet précis, comme la qualité de l'eau potable, les dangers de la fumée des feux de camp pour la santé, les maladies de la faune et les incidences de la construction de lieux de villégiature et de routes. Normalement, de tels programmes durent plusieurs années, tant que le problème n'est pas réglé. Au contraire, les *activités de recherche* sont de courte durée et procurent des informations sur le climat, l'hydrologie ou les rapports entre la faune et les habitats à l'échelle locale.

physical, biological or cultural. Multi-disciplinary projects were also recorded and unique projects which did not fit easily into any category were listed as other (e.g. geographic information system projects, remote sensing, and detailed soil analyses, etc.). The results presented here are based on the summaries of these more detailed analyses. Current monitoring activities are also compared to the proposed monitoring information presented in each park's Ecosystem Conservation Plan.

Table 1 is a summary of the current monitoring activities by subject. Biological monitoring dominates current activities at 63%. Physical monitoring follows at 25%, cultural at 8%, other at 3% and multi-disciplinary at 1%. Gros Morne National Park reported the highest number of current monitoring activities of all the parks, listing 46 activities. A wide range of current monitoring activities were reported, examples include daily weather monitoring reported at 22 parks, forest insect and disease monitoring reported at 25 parks, various flying animal and ungulate surveys to obtain information on both population and behaviour, and visitor usage impact monitoring.

Table 1: Current monitoring activities by subject

Subject	Number of projects	%
Physical	148	25
Biological – plants	75	13
Biological – animals	280	47
Biological – both	17	3
Cultural	50	8
Multi-disciplinary	8	1
Other	17	3
Total	**595**	**100**

Analysis of future additional monitoring activities yielded similar results, summarized in Table 2. Ninety-six additional monitoring activities were reported. Again, biological

Résultats par objet

L'enquête a permis de recueillir des informations sur les activités de surveillance actuelles et projetées. Dans les deux cas, les activités ont été divisées en cinq catégories, selon l'objet visé. La plupart des activités entrent dans l'une des trois grandes catégories : objet physique, biologique ou culturel. Les projets multidisciplinaires et les projets uniques, difficiles à classer, ont été placés dans la catégorie « autre » (p. ex. les projets de système d'information géographique, la télédétection, l'analyse détaillée des sols, etc.). Les résultats présentés ici sont fondés sur les résumés de ces analyses détaillées. Nous avons aussi comparé les activités de surveillance actuelles avec les activités prévues dans les plans de conservation des écosystèmes de chaque parc.

Le tableau 1 indique le nombre et le pourcentage des activités de surveillance actuelles selon leur objet. La majeure partie des activités, soit 63 %, porte sur les aspects biologiques. Viennent ensuite les activités de surveillance du milieu physique, 25 %, suivies par la surveillance du milieu culturel,

Tableau 1 : Activités de surveillance actuelles – présentation par objet

Objet	Nombre de projets	%
Physique	148	25
Biologique – plantes	75	13
Biologique – animaux	280	47
Biologique – les deux	17	3
Culturel	50	8
Multidisciplinaire	8	1
Autre	17	3
Total	**595**	**100**

8 %, les autres activités, 3 %, et les projets multidisciplinaires, 1 %. Le parc national du Gros-Morne a fait état du plus grand nombre d'activités de surveillance, soit 46. Une vaste

Table 2: Future additional monitoring activities by subject

Subject	Number of projects	%
Physical	22	23
Biological – plants	6	6
Biological – animals	43	45
Biological – both	9	9
Cultural	12	13
Multi-disciplinary	0	0
Other	4	4
Total	**96**	**100**

Tableau 2 : Activités de surveillance projetées – présentation par objet

Objet	Nombre de projets	%
Physique	22	23
Biologique – plantes	6	6
Biologique – animaux	43	45
Biologique – les deux	9	9
Culturel	12	13
Multidisciplinaire	0	0
Autre	4	4
Total	**96**	**100**

monitoring will dominate these activities at 60%, only 1% less than the current monitoring of this type. Monitoring of a physical nature follows at 23%, and cultural and other monitoring activities total 13% and 4% respectively. No multi-disciplinary monitoring projects are reported for the future. Gros Morne National Park reported the highest number of future additional monitoring activities, with 31 proposed projects; Elk Island followed with nine. In general, there is no major shift in the focus of future monitoring activities.

Table 3 summarizes the monitoring activities outlined in the ecosystem conservation plans. The detailed breakdown of projects from within the ecosystem conservation plans did not include categories for multi-disciplinary and other monitoring

Table 3: Monitoring activities by subject as listed in the ecosystem conservation plans

Subject	Number of projects	%
Physical	81	25
Biological – plants	30	9
Biological – animals	163	51
Biological – both	19	6
Cultural	25	8
Multi-disciplinary	0	0
Total	**318**	**100**

gamme d'activités ont été décrites, notamment la surveillance quotidienne des conditions météorologiques dans 22 parcs, la surveillance des insectes et des maladies qui affectent les forêts dans 25 parcs, diverses enquêtes aériennes sur les populations et les comportements d'animaux et d'ongulés, ainsi que la surveillance de l'incidence des activités des visiteurs.

L'analyse des activités de surveillance projetées donne des résultats semblables, présentés dans le tableau 2. On prévoit mener 96 nouvelles activités. Le volet biologique prédomine encore, représentant 60 % des activités, soit seulement 1 % de moins que le pourcentage actuel. Les activités de surveillance du milieu physique suivent, à 23 % ; la surveillance des aspects culturels et la catégorie « autre » représentent respectivement 13 % et 4 % du total. Aucune nouvelle activité de surveillance multidisciplinaire n'est prévue. C'est le parc national du Gros-Morne qui prévoit entreprendre le plus grand nombre de nouvelles activités de surveillance, soit 31, suivi de Elk Island, avec neuf. En général, on n'observe aucun changement majeur dans la répartition des types d'activités.

Le tableau 3 présente le nombre et le pourcentage des activités de surveillance prévues dans les plans de conservation des écosystèmes. La répartition détaillée de ces projets ne comprend pas les catégories multidisciplinaires et autres. Cependant, le

activities. However, strikingly similar results to the current monitoring situation do occur in the physical, biological and cultural categories. As in the current situation, the physical and cultural monitoring activities documented in the conservation plans totalled 25% and 8% respectively. Planned biological monitoring amounted to 66% in the conservation plans, just slightly over the current value of 62%. These results allow us to conclude that with respect to the subject analysis, current activities reflect what was planned. However, conservation plans reported 318 monitoring activities whereas the actual current total is 595 projects.

Cost results

Obtaining cost figures for each parks' monitoring programs proved to be the most difficult aspect of the survey. Most parks provided a partial information as best they could, therefore the costing analysis is only a good estimate of the actual situation. The park total values, as opposed to the salary and non-salary values, were the more reliable figures to use because some of the parks could not provide greater detail. The total Parks Canada cost of monitoring in 1994-95 is approximately $3.5 million dollars (Table 4). This is a substantial increase from the $1.479 million of 1990-91 and the 1992-93 amount of $2.3 million. An

Table 4: Monitoring expenditure, 1994-95

Costs	Parks Canada	Other agencies
Salary	$1,317,110	$419,340
Non-salary	$1,614,400	$508,000
No breakdown available	587,000	248,300
Total	**$3,518,510**	**$1,175,640**
	Total = $4,694,150	

Tableau 3 : Activités de surveillance prévues dans les plans de conservation des écosystèmes – présentation par objet

Objet	Nombre de projets	%
Physique	81	25
Biologique – plantes	30	9
Biologique – animaux	163	51
Biologique – les deux	19	6
Culturel	25	8
Multidisciplinaire	0	0
Total	**318**	**100**

pourcentage des activités ayant un objet physique, biologique ou culturel est très semblable à celui des activités actuelles. Les activités à caractère physique et culturel prévues dans les plans de conservation représentent respectivement 25 % et 8 % des activités totales. Les activités de surveillance biologique représentent 66 % des activités prévues, en légère hausse par rapport à leur pourcentage actuel de 62 %. Ces résultats nous autorisent à conclure qu'en ce qui touche l'analyse par objet, les activités actuelles correspondent aux prévisions. Cependant, les plans de conservation ne prévoyaient que 318 activités de surveillance, tandis que le total actuel se chiffre à 595.

Coûts

La détermination du coût des programmes de surveillance s'est avérée l'aspect le plus difficile de l'enquête. La plupart des parcs ont fourni une information partielle du mieux qu'ils ont pu. C'est pourquoi l'analyse des coûts n'est qu'une bonne estimation de la situation réelle. Le coût total, par opposition aux coûts salariaux et non salariaux, est le chiffre le plus fiable, étant donné que certains parcs n'ont pas pu fournir une information détaillée. Le coût total des activités de surveillance pour Parcs Canada en 1994-1995 s'élève à environ 3,5 millions

additional $1.2 million comes from the efforts of other agencies.

Co-operative agreements

Co-operative agreements contribute significantly to the amount of monitoring completed at Canada's national parks. Without the help of outside agencies, many of our current monitoring activities could not be executed. These types of arrangements are obviously of benefit to Parks Canada, but also to the participating agencies, who are provided with a controlled site, inexpensive field data throughout the year. Table 5 describes the proportion of co-operative agreements in the main subject areas. These proportions reflect the focus of the current and future monitoring plans. It is not surprising that 68% of co-operative agreements investigate issues which are biological in nature. Nineteen percent of the co-operative agreements deal with physical topics, and 8%, 5% and 1% look at other, multi-disciplinary and cultural issues respectively.

Table 5: Co-operative agreements by subject

Subject	Number of projects	%
Physical	37	19
Biological – plants	40	21
Biological – animals	81	42
Biological – both	10	5
Cultural	2	1
Multi-disciplinary	9	5
Other	12	6
Total	**191**	**100**

The types of organizations participating in co-operative agreements are summarized in Table 6. Forty-six percent of all agreements are held with other federal, provincial and territorial agencies. Academic

de dollars (tableau 4). Il s'agit d'une augmentation appréciable par rapport à 1,479 million de dollars en 1990-1991 et à 2,3 millions de dollars en 1992-1993. Une autre tranche de 1,2 million de dollars est prise en charge par d'autres organismes.

Tableau 4 : Coûts des activités de surveillance – 1994-1995

Coûts	Parcs Canada	Autre organisme
Salariaux	1 317 110 $	419 340 $
Non salariaux	1 614 400 $	508 000 $
Non ventilés	587 000 $	248 300 $
Total partiel	**3 518 510 $**	**1 175 640 $**
Total général	**4 694 150 $**	

Ententes de coopération

Les ententes de coopération favorisent grandement la réalisation d'activités de surveillance dans les parcs nationaux. Sans l'aide d'organismes extérieurs, un grand nombre de nos activités de surveillance ne pourraient pas être entreprises. Ces ententes profitent de toute évidence à Parcs Canada, mais aussi aux organismes participants, qui obtiennent un lieu contrôlé et des données de terrain peu coûteuses à longueur d'année. Le tableau 5 décrit la répartition des ententes de coopération par principaux domaines. Cette répartition correspond en gros à celle des activités de surveillance actuelles et

Tableau 5 : Ententes de coopération – présentation par objet

Objet	Nombre de projets	%
Physique	37	19
Biologique – plantes	40	21
Biologique – animaux	81	42
Biologique – les deux	10	5
Culturel	2	1
Multidisciplinaire	9	5
Autre	12	6
Total	**191**	**100**

institutions, colleges, universities and technical schools, participate in 27% of these agreements. Private consultants included a film company, ecological consultants, and private institutes and centres. The other category included various co-operating associations, volunteers, First Nations groups, Audubon societies, non-profit organizations such as the Canadian Parks and Wilderness Society, local conservation authorities, and several American government agencies and a university. These accounted for the remaining 23% of co-operative agreements. Associations, volunteers, First Nations groups, Audubon societies, non-profit organizations such as the Canadian Parks and Wilderness Society, local conservation authorities, and several American government agencies and a university. These accounted for the remaining 23% of co-operative agreements.

Table 6: Co-operative agreements by agency type

Agency type	Number	%
Environment Canada	30	15
Other federal gov't agency	18	9
Provincial or territorial gov't	44	22
Academic	54	27
Private	5	3
Other (including all foreign)	46	23
Total	**197**	**100**

projetées. C'est-à-dire que 68 % des ententes de coopération portent sur des questions biologiques, 19 % ont un objet physique, et que 8 %, 5 % et 1 % portent respectivement sur des aspects autres, multidisciplinaires et culturels.

Les types d'organismes qui participent aux ententes de coopération sont présentés dans le tableau 6. Les organismes fédéraux, provinciaux et territoriaux participent à 46 % des ententes. Les établissements d'enseignement (collèges, universités et écoles techniques) participent à 27 %. Parmi les participants privés, on compte une société cinématographique, des consultants en écologie et des instituts et centres privés. La catégorie « autre » comprend des associations coopérantes, des bénévoles, des groupes autochtones, des membres de la Fédération canadienne de la nature, des organisations sans but lucratif, comme la Société pour la protection des parcs et des sites naturels du Canada, des responsables locaux de la protection de la nature et plusieurs organismes gouvernementaux américains et une université américaine. Cette catégorie représente les autres 23 % des ententes de coopération.

Tableau 6 : Ententes de coopération – présentation par type d'organisme

Type d'organisme	Nombre	%
Environnement Canada	30	15
Autre org. fédéral	18	9
Org. prov. ou terr.	44	22
Établ. d'enseignement	54	27
Secteur privé	5	3
Autre (notamment étranger)	46	23
Total	**197**	**100**

DISCUSSION AND CONCLUSIONS

The data collected through the monitoring efforts at Canada's national parks represents a phenomenal amount of information from across the country, a significant resource in itself. These data are invaluable in making management decisions and in answering scientific queries. In the past, resource managers practised selective monitoring, overlooking the larger, more integrated picture. However, there is now a trend to monitoring on an ecosystem basis. The Ecosystem Conservation Plans, current and future monitoring plans all focus primarily on studies which are biological in nature, while still participating in some physical and cultural monitoring. This trend attempts to monitor on an ecosystem basis the biotic, abiotic, as well as the cultural aspects of ecosystems in an effort to better manage and care for them.

Given the financial constraints of the current economic climate, it is reassuring to see additional future monitoring programs listed. What is apparent though, is the need for improved data management and sharing to maximize the utility of existing monitoring programs and to eliminate areas of overlap. Programs such as Environment Canada's Ecological Monitoring and Assessment Network are designed to do just this, and will be of great help in the future, once firmly established.

Ecosystem Conservation Plans serve as planning documents, most often identifying stressors, mitigative measures and plans to monitor these mitigative measures. Our

ANALYSE ET CONCLUSIONS

Les données recueillies à la suite des activités de surveillance menées dans les parcs nationaux représentent une quantité phénoménale d'information sur toutes les régions du pays. Cette information est cruciale quand vient le temps de prendre une décision de gestion ou de répondre à une question d'ordre scientifique. Dans le passé, les gestionnaires des ressources ont exercé les activités de surveillance de manière sélective, sans chercher à les intégrer à une démarche plus globale. En revanche, la tendance à l'heure actuelle est à la surveillance à l'échelle des écosystèmes. Les plans de conservation des écosystèmes, de même que les activités de surveillance actuelles et projetées, portent principalement sur les aspects biologiques, sans pour autant omettre les aspects physiques et culturels. On cherche ainsi à surveiller, de manière globale, les aspects biotiques, abiotiques et culturels des écosystèmes, afin de les mieux gérer et protéger.

Malgré les contraintes financières imposées dans la conjoncture actuelle, il est réconfortant de constater qu'on prévoit mettre sur pied de nouveaux programmes de surveillance. L'enquête fait cependant ressortir le besoin de mieux gérer et partager les données, afin de maximiser l'utilité des programmes de surveillance actuels et d'éliminer les chevauchements. Des programmes comme le réseau de surveillance et d'évaluation écologiques d'Environnement Canada sont conçus à cette fin. Ils joueront

analysis has shown that their focus was also clearly biological. However, they lacked consistency from park to park, therefore making further comparisons difficult.

The $3.5 million spent on monitoring in 1994-95 reflects the commitment Parks Canada has made to monitoring. The increase of $1.2 million dollars from 1992-93 is encouraging. The 1994 values may also appear high because of the systematic nature of this study, i.e. this study was much more comprehensive than the previous two, therefore the actual increase in expenditures may not be as dramatic as reported. The 1990 and 1992 values could have been higher given the collection of more complete information. Twenty-five percent of national parks monitoring was executed by other agencies.

un rôle important dans l'avenir, une fois bien implantés.

Les plans de conservation des écosystèmes servent de documents de planification, qui, le plus souvent, inventorient les facteurs agressifs du milieu, définissent les mesures de protection nécessaires et établissent le mode de contrôle de ces mesures. Notre analyse révèle que les plans portent principalement sur les aspects biologiques. Ils manquent cependant d'uniformité d'un parc à un autre, ce qui rend difficile toute comparaison plus approfondie.

Les 3,5 millions de dollars dépensés pour la surveillance en 1994-1995 témoignent de l'engagement de Parcs Canada dans ce domaine. L'augmentation de 1,2 million de dollars par rapport à 1992-1993 est encourageante. Le chiffre des dépenses en 1994 peut aussi sembler élevé à cause de l'exhaustivité de la présente étude, menée de manière beaucoup plus systématique que les deux précédentes. L'augmentation réelle des coûts serait donc inférieure à l'augmentation apparente. On peut supposer que les montants pour 1990 et 1992 auraient été supérieurs si une information plus complète avait été recueillie. Le quart des activités de surveillance a été mené par d'autres organismes.

REFERENCES

Department of Canadian Heritage
1994. *Parks Canada: Guiding Principles and Operational Policies*. Minister of Supply and Services, Ottawa..

Welch, D.
1994. *Monitoring in Canada's National Parks*. Paper presented at the 2nd International Conference on Science and the Management of Protected Areas, Dalhousie University, Halifax, May 1994, at press.

BIBLIOGRAPHIE

Ministère du Patrimoine canadien
1994, *Parcs Canada : Principes directeurs et politiques de gestion*, ministère des Approvisionnements et Services, Ottawa.

Welch, D.
1994, *Monitoring in Canada's National Parks*, conférence présentée à la *Second International Conference on Science and the Managament of Protected Areas*, Dalhousie University, Halifax, mai 1994, sous presse.

APPENDIX I

Survey forms

ANNEXE I

Questionnaires

MONITORING IN NATIONAL PARKS, 1994-95

Handwritten replies will be accepted. Refer to the *hypothetical examples in italics* as a guide to the level of detail requested. If you need more space for any section, please use extra lines or extra pages and attach. If you have any questions about this survey, please contact David Welch, Tel: (819) 994-5532 or Lori Rissling, Tel: (819) 994-5533, or at the address and FAX shown on page 2. Thank you.

PARK NAME

CURRENT MONITORING (1994-95)

Do not report monitoring which has ended. Do report ongoing monitoring, even if no data is collected this year.

Title, description	Done by/with	Year started
Permanent vegetation plots and transects	*Parks Canada*	*1994*
Marten population status	*CWS and Parks Canada*	*1993*
Air visibility and particulates	*AES*	*1992*

COSTS OF CURRENT MONITORING (1994-95)

If you report a monitoring cost as shown in a park budget, your error should be 0%. Otherwise, enter your best guess for the amounts and error.

ESTIMATE OF COST TO THE PARK

Salary $_____ + Non-salary $_____ = Total $_____, Error +/- _____%

ESTIMATE OF COST TO OTHER AGENCIES

Salary $_____ + Non-salary $_____ = Total $_____, Error +/- _____%

Park name

FUTURE MONITORING

Include only monitoring endorsed or certain to be endorsed in formal documents such as an ecosystem conservation plan or monitoring plan.

Title, description	Done by/with	Year starting

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
University of Toronto	*Breeding birds research*	*1991*
Natural Resources Canada	*Glacier mass balance and field station*	*1990*

ANY COMMENTS ?

Information compiled by:	Signed:
_____	Date:
Print Name	

Please return the questionnaire to David Welch, Natural Resources Branch, Parks Canada, 25 Eddy St, 4th Floor, Hull, Québec K1A 0M5, or by FAX at (819) 994-5140.

Nous acceptons des réponses écrites à la main. Référez-vous aux *exemples hypothétiques en italiques* comme guide au niveau du détail demandé. Si vous avez besoin de plus d'espace, vous pourrez continuer sur d'autres lignes ou des pages additionnelles et les annexer au présent questionnaire. Si vous avez des questions concernant ce sondage veuillez communiquer avec David Welch, au (819) 994-5532 ou Lori Rissling, au (819) 994-5533, ou encore par Télécopieur ou en écrivant à l'adresse dont les détails sont indiqués à la page 2. Merci!

NOM DU PARC

LA SURVEILLANCE ACTUELLE (1994-1995)

Ne pas inscrire des programmes de surveillance terminés. Inscrire des programmes toujours en vigueur, même si aucune donnée n'a été recueillie cette année.

Titre, description	**Fait par/avec**	**Depuis quelle année**
Stations et transectes permanentes de végétation	*Parcs Canada*	*1994*
État de la population du martre d'Amérique	*SCF et Parcs Canada*	*1993*
La visibilité et les particules atmosphériques	*SEA*	*1992*

COÛTS DE LA SURVEILLANCE ACTUELLE (1994-95)

Si vous inscrivez un coût pour la surveillance tel qu'exprimé dans un budget d'un parc, votre erreur devrait être 0 %. Sans cela, devinez tous les deux au mieux que possible.

ESTIMATION DU COÛT AU PARC

$ salaire _____ + $ non-salaire _____ = $ total _____ Erreur ± _____ %

ESTIMATION DU COÛT AUX AUTRES AGENCIES

$ salaire _____ + $ non-salaire _____ = $ total _____ Erreur ± _____ %

Nom du parc

LA SURVEILLANCE PRÉVUE

Inscrivez seulement les programmes de surveillance approuvés ou garantis d'être approuvés dans des documents officiels tel qu'un plan de conservation écologique ou un plan de surveillance.

Titre, description	**Faite par/avec**	**Année du début**

ENTENTES COOPÉRATIVES, ACTUELLES ET POTENTIELLES

Organisme	**Sujet**	**Depuis quelle année**
Université de Toronto	*Recherche sur la saison des nids des oiseaux*	*1991*
Ressources naturelles Canada	*Equilibre de la masse glaciaire et station sur le terrain*	*1990*

DES COMMENTAIRES ?

Information compilée par: **Signé:**

Date:

Nom (en majuscules S.V.P.)

Veuillez retourner le questionnaire à David Welch, Direction des ressources naturelles, Parcs Canada, 25 rue Eddy, 4e étage, Hull, Québec K1A 0M5, ou par télécopieur au (819) 994-5140.

APPENDIX II

Park Responses

The following information is reproduced verbatim from the original submissions and corrected review copies received from each park by 31 January 1995. Editing is restricted to spelling out or the insertion of some acronyms to aid the reader or improve formatting.

N.A. = not available
S/O = sans observation
DFO = Department of Fisheries and Oceans
DOE = Department of the Environment

ANNEXE II

Réponses des parcs

Sont reproduits ci-après tels quels les rapports originaux et corrigés reçus des parcs avant le 31 janvier 1995. La révision se limite à écrire au long ou à insérer certaines abréviations, afin d'aider le lecteur ou d'améliorer la présentation.

N.A. = not available
S/O = sans observation
DFO = Department of Fisheries and Oceans
DOE = Department of the Environment

AULAVIK NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Aerial surveys of Muskox on Banks Island	Renewable Resources (Inuvik)	1980
Aerial surveys of Caribou on Banks Island	Renewable Resources (Inuvik)	1980
Aerial surveys of Wolf on Banks Island	Renewable Resources (Inuvik)	1980
Water quality monitoring in Thompson River in Aulavik	Department of Indian Affairs and Northern Development	1993
Breeding bird survey-especially Snow Geese	Canadian Wildlife Service	1985

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 0 k + Non-salary $ 0 k = Total $ 0 k, Error +/- 0 %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ 4.0 k + Non-salary $ 22.0 k = Total $ 26.0 k, Error +/- 30 %

FUTURE MONITORING

Title, description	Done by/with	Year starting

Extensive monitoring will start in 1995, but the program has not been approved yet and can therefore not be documented here.

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started

Nothing reported.

ANY COMMENTS ?

Aulavik is just developing an extensive monitoring program. The decision about what will be monitored and how lies with a research committee that consists of local people from Sach Harbour and Parks Canada staff. Decisions will be made in November 1994 and it is anticipated that a program will be in place for the 1995 field season.

Information compiled by: Martin Raillard, District Ecologist

Date: 11/10/94

AUYUITTUQ NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Polar Bear survey (by snowmobile)	Parks Canada	1985
Caribou survey	Parks Canada	1991
Raptor survey	Parks Canada	1987
Geese nesting survey (by foot)	Parks Canada	1987
Climatology (automated weather station)	Atmospheric Environment Service & Parks Canada	1991

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 10.0 k + Non-salary $ 1.0 k = Total $ 11.0 k, Error +/- 10 %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ 1.0 k + Non-salary $ 5.0 k = Total $ 6.0 k, Error +/- 10 %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Water quality monitoring station	Environment Canada	1995
Trafficability plots	Parks Canada	1994

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started

See current monitoring. All projects are supported by Polar Continental Shelf Project (Natural Resources Canada).

ANY COMMENTS ?

Present proposed budget cuts (25-40%) and staff reductions will be a major barrier to the implementation of effective ecosystem monitoring plans.

Information compiled by: Renee Wissink, A/Chief Park Warden and Yves Bossé

Date: 07/10/94

BANFF NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Climate station	Atmospheric Environment Service	N.A.
Weather station	Atmospheric Environment Service	N.A.
Flood forecasting	Alberta Environment	N.A.
Snowpack surveys	Alberta Environment	N.A.
Bear monitoring	neighbouring agencies	N.A.
Bow Elk count	John Woods/Rev Glacier	N.A.
Aggressive Elk	Town of Banff/Kootenay National Park	N.A.
Mortality monitor	Alberta/B.C. Fish & Wildlife	N.A.
Annual wildlife census	Alberta/B.C. Fish & Wildlife	N.A.
Winter/spring Bird count	Bow Valley Naturalists	N.A.
Tropical Migrant census	Canadian Wildlife Service	N.A.
Genetics program	University of Alberta	N.A.
Disease monitor	Alberta Environment	N.A.
Daily fire weather	Environment Canada	N.A.
Monitor fires	Canadian Forestry Service	N.A.
Insect/disease survey	Canadian Forestry Service	N.A.
Weed survey	MD Bighorn	N.A.
Streamflow monitoring	Atmospheric Environment Service-Inland Waters & Trans ALTA	N.A.
Water quality monitoring	Atmospheric Environment Service-Inland Waters	N.A.
Water quality monitoring (sewage treatment)	Parks Canada Lake Louise Sewage Treatment Plant	
	Town of Bannf Sewage Treatment Plant	pre 1985
Bow Lake creel survey	Parks Canada	N.A.
Trail use survey	Neighbouring agencies	N.A.
Campsite use surveys	backcountry section	N.A.
Hut/lodge use surveys	Alpine Club Canada	N.A.
Highway/road use survey	Alberta Region	N.A.

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 200.0 k + Non-salary $ 200.0 k = Total $ 400.0 k, Error +/- 20 %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ 100.0 k + Non-salary $ 20.0 k = Total $ 120.0 k, Error +/- 30 %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Nothing reported.		

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started

The Ecosystem Section will continue to aggressively utilize universities, co-operating agencies, and contractors to conduct scientifically competent ecosystem research, monitoring and management actions with minimum cost to the crown.

ANY COMMENTS ?

Nothing reported.

Information compiled by: Joanne Cairns for Cliff White
Date: 10/11/94

BRUCE PENINSULA NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Frog chorus survey	Parks Canada and ?Ont. Herpetile Survey	1993
Raptor and colonial species banding	Parks Canada and Canadian Wildlife Service	1994
Forest bird monitoring	Parks Canada and Canadian Wildlife Service	1990
Eastern Massasauga Rattlesnake population	Parks Canada	1990
Climatological data	Parks Canada and Environment Canada	1989
Fire weather data	Parks Canada and Ont. Min. Natural Resources	1989
Winter severity data	Parks Canada	1989
Predator abundance	Parks Canada	1993
Deer browse survey	Parks Canada	1993
Aerial extent of winter deer yard	Parks Canada	1993
Rare plant plots	Parks Canada	1994
Vegetation transects	Parks Canada	1994
Also, but excluded from cost estimate:		
Visitor use statistics	Parks Canada	1989
Occurrences on OTIS (resource management/public safety/law enforcement)	Parks Canada	1989

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 14.0 k + Non-salary $ 1.6 k = Total $ 15.6 k, Error +/- 10 %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ 0 k + Non-salary $ 0 k = Total $ 0 k, Error +/- 0 %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Marsh bird survey	Parks Canada	1995

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
University of Guelph	Niagara Escarpment biophysical (cliff ecology)	1991
University of Guelph	Island biogeography research	1995
McMaster University	Cave ecology	1995
University of Waterloo	Field ecology course location	1995
University of Waterloo	Vegetation succession study	1994
Ontario Ministry of Environment	Niagara Escarpment Biosphere Reserve	1995
Ontario Ministry of Natural Resources	Fisheries, bear, and deer management	1990

ANY COMMENTS ?

Please remember that Fathom Five National Marine Park and Bruce Peninsula National Park are adjacent (*i.e.* within the same 'greater park ecosystem') and monitoring efforts in one Park have a bearing on the other Park.

Information compiled by: Scott Parker

Date: 14/10/94

CAPE BRETON HIGHLANDS NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Fish creel census (swimthrough)	Parks Canada	1927
Creel census (swimthrough)	Parks Canada	1984
Moose	Parks Canada & Nova Scotia Department of Natural Resources	1988
Water quality	Environment Canada	1987
Avifauna	Nova Scotia Bird Society	1970
Climate data	Atmospheric Environment Service	1950
Fire weather	Nova Scotia Department of Natural Resources	1970
Forest insects	Canadian Forestry Service	1980
Wildlife disease	Parks Canada & University of P.E.I.	1990
Avifauna	Long Point Bird Observatory & Canadian Lakes Loon Survey	1990
Avifauna - Terns	Parks Canada	1975
ARNEWS	Natural Resources Canada	1993

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $__N.A.__ k + Non-salary $__N.A.__ k = Total $__N.A.__ k, Error +/- __N.A.__ %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $__N.A.__ k + Non-salary $__N.A.__ k = Total $__N.A.__ k, Error +/- __N.A.__ %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Plateau microclimate	Parks Canada & Atmospheric Environment Service	1997
Rural encroachment	Parks Canada	1995
Herptile	Parks Canada	1996

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
Natural Resources Canada	Forest insect and disease surveys	ongoing
Nova Scotia Department of Environment	Groundwater monitoring	ongoing

ANY COMMENTS ?

Nothing reported.

Information compiled by: Lary Brown

Date: 25/11/94

ELK ISLAND NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Shrub species composition, productivity, & utilization	Parks Canada	1985
Grassland community assessment	Parks Canada	1992
Grass, sedge, & forb biomass productivity & utilization	Parks Canada	1984
Forest stand age structure	Northern Alberta Institute of Technology	1992
Non-native plants	Parks Canada	1991
Forest insect and disease survey	Canadian Forestry Service	1980
Fire effects on vegetation	Parks Canada	1981
Water quality monitoring and analysis	Environmental Protection Service & Parks Canada	1980
Astotin Lake level readings	Parks Canada & Atmospheric Environment Service	1966
Elk Island N.P. weather/climate data	Parks Canada	1966, 1980
Atmospheric nitrogen deposition	University of Regina	1994
Ungulate population dynamics (aerial survey)	Parks Canada	1960
Physiological condition of Elk and Moose	Parks Canada	1989
Small mammal survey	Parks Canada	1993
Beaver population and distribution survey	Parks Canada	1984
Trumpeter Swan re-introduction research	Canadian Wildlife Service & Elk Island N.P.	1987
Spring bird survey	Elk Island N.P. & volunteers	1983
Breeding bird survey	Elk Island N.P.	1993
Ungulate population structure	Canadian Wildlife Service & Parks Canada	1977
Christmas bird count	Parks Canada & Edmonton Bird Club	1984
Owl survey	Parks Canada & volunteers	1985
Red-Necked Grebe bi-annual survey - Astotin Lake	Parks Canada	1978
Double-Crested Cormorant survey	Parks Canada	1988
Great Blue Heron survey	Parks Canada	1984
White Pelican survey	Parks Canada & Alberta Fish and Wildlife	1993
Bison morphology and weight dynamics	Parks Canada & Canadian Wildlife Service	1980
Muskrat survey	Parks Canada	1985
Brook Stickleback skeletal characteristics, Astotin Lake	Dr. J. Nelson	1969

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 100.0 k + Non-salary $ 25.0 k = Total $ 125.0 k, Error +/- 16 %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ 16.5 k + Non-salary $ 4.0 k = Total $ 20.5 k, Error +/- 25 %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Native prairie restoration - seed mix trials	University of Alberta & Elk Island N.P.	1994/5
Global climate change - vegetation response	Parks Canada	1996
Winter track counts	Parks Canada	1996
Bat survey	Parks Canada	1997
Pre/post burn wildlife monitoring	Parks Canada	1997
Invertebrate monitoring	Parks Canada	1996
Herptile monitoring	Parks Canada	1997
Aquatic ecosystem health	Alberta Environmental Centre and Parks Canada	1995

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
Canadian Wildlife Service	Pan-American (neotropical) Migrant Bird research	1990
University of Alberta	Forest Tent Caterpillar viral disease research	1980
University of Alberta	Formica and Polyergus Ants - behavioral research study	1991
Korvonen Films Ltd.	Film and record wildlife in Elk Island N.P.	1991
Alberta Archaeological Survey Group	Museum display collection	1985
University of Alberta	Native prairie restoration - seed mix trials	1994
Canadian Parks and Wilderness Society	Beaver Hills ecosystem research network	1993
Canadian Wildlife Service	Wood Bison recovery program	1965
Canadian Wildlife Service	Trumpeter Swan re-introduction program	1983
University of Alberta	Transboundary Coyote movements	1993
University of Alberta	Deer ecology study	1994
University of Alberta	Moose/Tick interactions	1994
Alberta Environment Centre	Aquatic invertebrate inventory	1994
Alberta Environment Centre	Bird communities and forest structure	proposed
B.C., Alberta and Saskatchewan governments	Elk transplants	1983
Alberta Environment Centre	Aquatic indicator species	1995
University of Regina	Atmospheric nitrogen deposition	1993
Northern Alberta Institute of Technology	Forest stand age - student project	1992
Alberta Environment Centre	*Festuca hallii* seed production	1992
local landowners, Kalyna Country Eco-museum, and Friends of Elk Island National Park	Native prairie preservation and seed harvesting	1994
University of Alberta	Brook Stickleback skeletal characteristics	1969
Atmospheric Environment Service	Weather station operation, maintenance, and info exchange	1980
Environmental Protection Service	Water quality monitoring and analysis	1980
Friends of Elk Island National Park	Foster protection and presentation of Elk Island National Park & fund raising for Trumpeter Swan program	1984

ANY COMMENTS ?

Nothing reported.

Information compiled by: Anne Dickinson, Rob Kaye, and Norm Cool

Date: 13/10/94

ELLESMERE NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
ITEX (International Tundra Experiment)	University of Toronto & Parks Canada	1994
Soils and vegetation trafficability	Agriculture Canada & Parks Canada	1989
Endangered species monitoring program (plants & animals)	Government of the Northwest Territories Renewable Resources & Parks Canada	1994
Annual wildlife survey (ungulates & all others)	Parks Canada	1989
Lake Hazen Char monitoring	Department of Fisheries and Oceans & Parks Canada	1990

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 50.0 k + Non-salary $ 100.0 k = Total $ 150.0 k, Error +/- 20.0 %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ 50.0 k + Non-salary $ 75.0 k = Total $ 125.0 k, Error +/- 20.0 %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Water quality	Environment Canada	1995

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started

See current monitoring. All projects are also supported by the Polar Continental Shelf Project (Natural Resources Canada).

ANY COMMENTS ?

Present proposed budget cuts (25-40%) and staff reductions will be a major barrier to the implementation of effective ecosystem monitoring plans.

Information compiled by: Renee Wissink

Date: 15/11/94

FATHOM FIVE NATIONAL MARINE PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Zebra Mussel monitoring	Parks Canada & Ont. Min. of Natural Resources	1994
Shipwreck monitoring	Parks Canada & Fisheries & Oceans (DFO)	1993
Littoral community monitoring	Parks Canada	1994
Aquatic ecosystem health - water quality	Parks Canada, Environment Canada and DFO	1994
Hawk migration	Parks Canada & HAMANA (Hawk Migration Across North America)	1989
Fish community assessment	Parks Canada	1993

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 3.6 k + Non-salary $ 0.5 k = Total $ 4.1 k, Error +/- 10 %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ 1.0 k + Non-salary $ 5.0 k = Total $ 6.0 k, Error +/- 10 %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Lake Trout re-introduction success	Parks Canada & Ont. Ministry of Natural Resources	1995

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
Ontario Ministry of Natural Resources	Commercial and sport fishery	1995
University of Guelph	Island biogeography research	1995

ANY COMMENTS ?

Please remember that Fathom Five National Marine Park and Bruce Peninsula National Parks are adjacent (*i.e.* within the same 'greater park ecosystem') and monitoring efforts in one Park have a bearing on the other Park.

Information compiled by: Scott Parker

Date: 14/10/94

PARC NATIONAL FORILLON

LA SURVEILLANCE ACTUELLE (1994-1995)

Titre, description	Fait par/avec	Depuis quelle année
Station de neige au sol	Parcs Can	1971
Dégradation sur les sites aménagés	Parcs Can	1979
Population de phoques	Parcs Can	1973
Suivi de la pêche sportive	Parcs Can	1985
Transects de pistes hivernales	Parcs Can	1992
Suivi de réintroduction du Faucon pèlerin	Parcs Can	1989
Suivi de la Salicaire pourpre	Parcs Can	1992
État de la population de la Martre d'Amérique	Parcs Can	1993
Indice forêt-météo (initié cette année; en vigueur l'an prochain)	Parcs Can	1994
Suivi des populations d'oiseaux marins	Parcs Canada et Service Canadian de la Faune	S/O

LA SURVEILLANCE ACTUELLE (1994-1995)

ESTIMATION DU COÛT AU PARC

Salaire $ 14.7 k + Non-salaire $ S/O. k = Total $ 14.7 k, Erreur +/- 10 %

ESTIMATION DU COÛT AUX AUTRES AGENCES

Salary $ S/O k + Non-salaire $ S/O k = Total $ S/O k, Erreur +/- S/O %

LA SURVEILLANCE PRÉVUE

Titre, description	Fait par/avec	Depuis quelle année
Population d'amphibiens	Parcs Canada	1995
Faune ichtyologique	Parcs Canada	2000
Écosystèmes aquatiques (faune et physic-chimie)	Parcs Canada	S/O
Écosystèmes terrestres (species-ciblés)	Parcs Canada	S/O

ENTENTES COOPÉRATIVES, ACTUELLES ET POTENTIELLES

Organisme	Sujet	Depuis quelle année
Sans observation		

DES COMMENTAIRES ?

Sans observation

Information compileé par: Stéphane Marchand et Denis Comeau, Gardes et spécialistes en gestion des ressources.

Date: 12/10/94

FUNDY NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Atmospheric weather	New Brunswick Dep't of Environment and Environment Canada Atmospheric Environment Service	1951
Acid precipitation monitoring, including:		
Fog	Canadian Forestry Service	1990
Ozone	Atmospheric Environment Service	1991
Water temp	Parks Canada	1992
Passive ozone	New Brunswick Department of Environment	1994
Wildlife cards	Parks Canada	unknown
Winter tract transects	Parks Canada	1976
Permanent sample plots	Parks Canada	1976
Salmon swimthrough - instream	Parks Canada	1984
Amphibian egg mass	Parks Canada	1985
Night flying insects	Canadian Forestry Service	1953
Gypsy moth	Canadian Forestry Service	1984
Christmas Bird count	New Brunswick Federation of Nature & Audubon Society	1978
Peregrine Falcon	Parks Canada	1980
Rare bird/spring bird	Parks Canada & volunteers	1993
List monitoring	Parks Canada	1991
Water quality	Environment Canada	approx. 1970

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 35.0 k + Non-salary $ N.A. k = Total $ 35.0 k, Error +/- N.A. %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ N.A. k + Non-salary $ N.A. k = Total $ N.A. k, Error +/- N.A. %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Plantations	Parks Canada & other government departments to be determined	approx. 1996
Biodiversity	Parks Canada & other government departments to be determined	approx. 1995

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
University of New Brunswick - I. Methven	'Greater Fundy Ecosystem'	1991
Canadian Forest Service	Forest insect and disease monitoring	ongoing
Natural Resources Canada	ARNEWS-acid fog monitoring	ongoing
Atmospheric Environment Service	Automated weather station	ongoing
Environment Canada	Hydrology, water chemistry, & ozone	ongoing
New Brunswick Department of Environment	Acid rain, water quality, & index rivers	ongoing
New Brunswick Department of Natural Resources	Soils, forest cover, & classification	ongoing

ANY COMMENTS ?

Nothing reported.

Information compiled by: Lary Brown
Date: 29/11/94

GEORGIAN BAY ISLANDS NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Amphibian/reptile status	Parks Canada	1979
Amphibian breeding success	Parks Canada	1989
Amphibian breeding water analysis	Parks Canada	1989
Christmas bird count	Parks Canada & Audubon Society	1978
Massasauga rattlesnake	Parks Canada	1978
OSV trail usage	Parks Canada	1993
Eastern Fox snake hibernaculum	Parks Canada	1988
Eastern Spotted turtle status	Parks Canada	1991
Beaver populations	Parks Canada	1977
White-tailed deer winter severity	Parks Canada & Ont. Min.of Natural Resources	1985
Winter mammal track survey	Parks Canada	1985
Facility impact survey	Parks Canada	1989
Gypsy moth egg mass/defoliation	Parks Canada	1989
Aquatic resources - inland lakes	Parks Canada	1993
Weather data	Parks Canada & Atmospheric Environment Service	1974
Water quality	Parks Canada, Ontario Ministry of Health, & Remedial Action Plan	1990
Fire weather index	Parks Canada	1974
Prairie warbler	Parks Canada	1989
Cerulian Warbler	Parks Canada	1992
Colonial birds	Parks Canada & Canadian Wildlife Service	1978
Rare vascular plants	Parks Canada	1992
Osprey nesting	Parks Canada	1989

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 30.0 k + Non-salary $ 5.0 k = Total $ 35.0 k, Error +/- N.A. %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ N.A. k + Non-salary $ N.A. k = Total $ N.A. k, Error +/- N.A. %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Nothing reported.		

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
Nothing reported.		

ANY COMMENTS ?

Nothing reported.

Information compiled by: Hugh Bremner

Date: 15/11/94

GLACIER NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Mount Tupper Goat population	Parks Canada	1992
Caribou population	Parks Canada, B.C. Ministry of Forests, & B.C. Ministry of Environment	1991
Christmas Bird count	Parks Canada & Friends of Glacier	1981
Bear population	Parks Canada	1960's
Illecillewaet Glacier movements	Parks Canada, Inland Waters, & B.C. Hydro	1972
Traffic monitoring	Parks Canada	1962
Innovations in weather and snow measurement	Parks Canada & Univ. of B.C.	approx. 1993
Trail monitoring	Parks Canada	approx. 1976
Facility use monitoring	Parks Canada	1962
Avalanche activity monitoring	Parks Canada	approx. 1958
Avalanche weather monitoring	Parks Canada	approx. 1958
Drinking water sampling	Parks Canada & Public Health	1960's
Water quality sampling	Parks Canada	unknown
Forest fire monitoring	Parks Canada & B.C. Ministry of Forests	unknown
Forest insect and disease monitoring	Parks Canada & Canadian Forestry Service	unknown
Noxious weed monitoring	Parks Canada	unknown
Roadkill monitoring	Parks Canada	1960's

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $__N.A.__ k + Non-salary $__N.A.__ k = Total $__50.0__ k, Error +/- __N.A.__ %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $__N.A.__ k + Non-salary $__N.A.__ k = Total $__N.A.__ k, Error +/- __N.A.__ %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Old growth Bat populations	B.C. Hydro	1995 or later

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
B.C. Hydro	Caribou, Bears, Bats, & Wolverine populations	1992
B.C. Hydro	Climate	1992
B.C. Hydro	Avalanche ecology	1992
B.C. Ministry of Forests	Caribou, Bears, Wolves, wildlife, & trees	1992
B.C. Ministry of Environment, Lands, and Parks	Caribou, Bears, Wolverines, Bats, wildlife, & trees	1992
Canadian Wildlife Service	Neotropical migrant monitoring	1992
Friends of Mt. Revelstoke/Glacier	All of the above	1993
Inland Waters	Glacier studies	1972
North Columbia Mountains ecological research group	All of the above	1993
University of B.C.	Forest fragmentation	1993
B.C. Ministry of Transportation	Impact of roads	potential

ANY COMMENTS ?

Nothing reported.

Information compiled by: John G. Woods, Faunal Specialist
Date: 28/11/94

GRASSLANDS NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Rattlesnake study	University of Regina	1994
Swift Fox restoration	Swift Fox Recovery Team	1994
Permanent vegetation plots	D.A. Westworth Ltd & Parks Canada	1993
Christmas Bird counts	Saskatchewan Naturalist Society	1989
Christmas Mammal counts	Saskatchewan Naturalist Society	1989
Weather monitoring	Atmospheric Environment Service & Parks Canada	1993

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 2.5 k + Non-salary $ 1.7 k = Total $ 4.2 k, Error +/- 1 %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ 0 k + Non-salary $ 5.0 k = Total $ 5.0 k, Error +/- 50 %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Sampling framework for ecological inventory and monitoring research	Parks Can & University collaborators	1995

Including 5 year study of effects on biodiversity of:

1) grazing,
2) Prairie Dogs,
3) exotic grasses, and
4) slope erosion

*this program has not received final approval, but is highly recommended in Conservation Plan Review

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
University of Regina	GIS service agreement	1989

ANY COMMENTS ?

Nothing reported.

Information compiled by: Stephen McCanny

Date: 07/11/94

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Water quality monitoring	Environmental Conservation-Parks Canada	1992
Long Range Monitoring of Atmospheric Pollutants (LRTAP)	Environmental Conservation-Parks Canada	1980
LRTAP	Dep't of Fisheries and Oceans & Parks Canada	1989
Lomond River fishway monitoring	Dep't of Fisheries and Oceans & Parks Canada	1960
Shallow Bay sand dune migration	Parks Canada	1975
Western Brook counting fence	Dep't of Fisheries and Oceans & Parks Canada	1988-92
Gravel extraction - Rocky Barachois	General Works-Parks Canada	1971
Quarry extraction	General Works-Parks Canada	1978
Small mammal and bird road kills	Parks Canada	N.A.
Large mammal road kill	Warden Service-Parks Canada	1971
Salmonid Creel surveys	Warden Service-Parks Canada & DFO	1989-94
White Pine regeneration	Warden Service-Parks Canada	1985
Forest insect and disease survey	Canadian Forestry Service	1950
Bottom brook discharge	Environmental Conservation-Parks Canada	1985
Wildlife sightings	Resource Conservation-Parks Canada	1993
Motor traffic survey	Resource Conservation-Parks Canada	1975
Caribou monitoring	Resource Conservation-Parks Canada	1978
Loon surveys	Canadian Wildlife Service & Parks Canada	1992
Eagle nesting surveys	Parks Canada	1983
Pine marten track surveys	Parks Canada	1985
Harlequin Duck survey	Canadian Wildlife Service & Parks Canada	1992
Domestic harvest of timber	Parks Canada	1973
Domestic harvest of Snow Shoe Hare	Parks Canada	1971
Park visitor survey	Visitor Activities-Parks Canada	1971
Bear-human conflicts	Resource Conservation-Parks Canada	1973
Christmas bird count	Newfoundland and Labrador Natural History Society & Parks Canada	1973
Breeding bird survey	Canadian Wildlife Service & Parks Canada	1973
Maritime shorebird survey	Canadian Wildlife Service & Parks Canada	1988
Newfoundland nest record scheme	Canadian Wildlife Service & Parks Canada	1988
Special raptor survey	Parks Canada	1988
Tern longterm monitoring	Canadian Wildlife Service & Parks Canada	1980
Meterological monitoring	Atmospheric Environment Service & Parks Canada	1973
Coastal geomorphology and sediments	Geological Survey of Canada & Parks Canada	1991
Serpentine ecology and groundwater	Canadian Forestry Service	1990
Big Level snowbed monitoring	Parks Canada	1994
Caribou migration monitoring study	NFLD Wildlife Division & Parks Canada	1992
Arctic hare monitoring	Parks Canada	1992
Marine intertidal zone monitoring	Memorial University & Parks Canada	1992
Rock slide monitoring-Hwy 430	Gen'l Works-Parks Can. & Public Works Can.	1978
Beaver pond monitoring-Hwy 430	Resource Conservation-Parks Canada	1980
Poaching activity monitoring	Resource Conservation-Parks Canada	1973
Water quality testing	NFLD Health & Parks Canada	1973
Monitoring of Dry Brook deposition	Parks Canada	1991
Moose/Hare browse exclosures	Canadian Wildlife Service	1975
Lomond landfill operation	Parks Canada	1990
Monitoring of selected geological processes	Dr.Tony Berger (private)	1989

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 160.0 k + Non-salary $ 30.0 k = Total $ 190.0 k, Error +/- 10 %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ 70.0 k + Non-salary $ 20.0 k = Total $ 90.0 k , Error +/- N.A. %

FUTURE MONITORING

Title, description	Done by/with	Year start
Wildlife sighting cards-selected species	Parks Canada	1
Moose stratified surveys	Newfoundland Wildlife Division	
Caribou monitoring	Newfoundland Wildlife Division	
Loon survey	Canadian Wildlife Service	2
Raptor nesting	Newfoundland Natural History Society	1983 (or 3)
Domestic harvest of timber	Parks Canada	(ng
Domestic harvest of Snow Shoe Hare	Parks Canada	ng
Park visitor survey	Visitor Activities-Parks Canada	ing
Bear-human conflict	Parks Canada	oing
Water quality monitoring	Environmental Conservation-Environment Can	1992
LRTAP (on 6 lakes)	Environmental Conservation-Environment Car	1993
Ground River fishway	Department of Fisheries and Oceans	1995
Shallow Bay sand dunes migration	Parks Canada	1995
Gravel extraction	Parks Canada	ongoing
Large mammal road kill	Parks Canada	ongoing
Salmonid creel survey	Department of Fisheries and Oceans	ongoing
Forest insect and disease	Canadian Forestry Service	ongoing
Bottom Brook discharge	Environmental Conservation-Env.Canada	ongoing
Maritime shorebird survey	Canadian Wildlife Service	ongoing
Breeding bird survey	Canadian Wildlife Service	ongoing
Tern monitoring	Canadian Wildlife Service	ongoing
Meterological monitoring	Atmospheric Environment Service	ongoing
Coastal geomorphology and sediments	Geological Survey of Canada	1992
Caribou migration monitoring	Newfoundland Wildlife Division	1992
Arctic Hare monitoring	Memorial University	1992
Marine intertidal zone	Memorial University	1992
Rock slide monitoring-Hwy 430	Public Works Canada	ongoing
Poaching activity monitoring	Newfoundland Wildlife Division	ongoing
Water quality testing	Newfoundland Health	ongoing
Monitoring Dry Brook	General Works	ongoing
LRTAP at Harding Pond	Dep't of Fisheries & Oceans and Parks Canada	1989

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
Wildlife Division, Department of Tourism and Culture	Caribou ecology and OSV disturbance	1992
	Moose ecology in Gros Morne N.P. Region	1995
	Forest ecology in Gros Morne N.P. Region	1993
	Black Bear ecology in Gros Morne N.P. Region	1993
	Joint wildlife initiatives	1992
Memorial University	Arctic Hare ecology in Gros Morne N.P. Region	1994
	General co-operative agreement	approx. 1980
Environment Can-Environmental Conservation	LRTAP	1992
Environment Can-Monitoring and Evaluation Branch	Water quality monitoring Western Brook Pond and other water bodies in Gros Morne N.P.	1992
Atmospheric Environment Service	Automated weather station	1991
Department of Fisheries and Oceans	LRTAP at Harding Pond	ongoing
	Co-operative agreement of fisheries enforcement (including monitoring of activity)	1992
	Co-operative agreement on mgmt of Lomond River salmonid population and habitat	1992

ANY COMMENTS ?

1) Co-operative agreements with the Department of Fisheries and Oceans concerning the Lomond River and Western Brook are underway, or are being planned. 2) A large multi-partner co-operative agreement is being planned concerning the proposed Discovery Centre. 3) A model forest co-operative program also exists at an informal level to date, but will probably become more formal soon. Parks Canada is represented on the Integrated Management Committee for the Western Newfoundland Model Forest. 4) Be advised that many current monitoring projects have been started and discontinued. Some monitoring has been done sporadically with small or large breaks. Some are being re-initiated.

Information compiled by: Doug Anions and Hank Deichmann

Date: 26/10/94

GWAII HAANAS NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Stellar Sea Lion survey	Parks Canada & DFO	1990 (every 5 years)
Harbour Seal survey	Parks Canada & DFO	1990 (every 5 years)
Permanent growth/yield sample plots	Parks Canada & Ministry of Environment	approx. 1963
Salmon escapement	Department of Fisheries and Oceans	1947
Visitor numbers	Parks Canada & Haida Gwaii Watchmen	1988
Peregrine Falcon surveys	B.C. Min. of Env't & Parks Canada	1989 (every 5 years)
Racoon monitoring	Canadian Wildlife Service, Parks Canada, B.C.Parks, & Ministry of Environment-wildlife	1994
Seabird monitoring	Canadian Wildlife Service, LBCS, & Parks Canada	1989
Cetacean monitoring	DFO & Vancouver Aquarium	1989

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ N.A. k + Non-salary $ N.A. k = Total $ 20.0 k, Error +/- N.A. %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ N.A. k + Non-salary $ N.A. k = Total $ N.A. k, Error +/- N.A. %

FUTURE MONITORING

Title, description	Done by/with	Year starting
No plans in place yet -- lots of potential though.		

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
No cooperative agreements formally in place -- all informal or contractual agreements are project specific.		

ANY COMMENTS ?

Nothing reported.

Information compiled by: Todd Golumbia

Date: 10/10/94

IVVAVIK NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Aerial survey of Porcupine Caribou herd	Yukon Renewable Resources	1985
Firth and Babbage River water flow monitoring	Canadian Hydrological Survey	1975
Campsite impact monitoring (*e.g.* vegetation, litter, effects on soil and permafrost, & general destruction)	Parks Canada	1990
Grizzly bear monitoring (abundance, distribution, habitat use, and reproduction)	Parks Canada	1993
Contaminants in caribou and vegetation	Dep' of Indian Affairs and Northern Development	1990
Hunted species harvest survey	Yukon Renewable Resources	1986
Wolverine survey (population and distribution)	Yukon Renewable Resources & Gov't of N.W.T.	1993
Muskox survey (population, herd composition, and distribution)	Yukon Renewable Resources	1993

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 20.0 k + Non-salary $ 141.5 k = Total $ 161.5 k, Error +/- 10 %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ 42.0 k + Non-salary $ 150.0 k = Total $ 192.0 k, Error +/- 25 %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Permanent automated weather station	Atmospheric Environment Service & Parks Canada	1995

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
Nothing reported.		

ANY COMMENTS ?

Nothing reported.

Information compiled by: Martin Raillard, District Ecologist

Date: 13/10/94

JASPER NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Development of monitoring program	Parks Canada	1994
Preliminary Reptile work	Parks Canada	1994
Preliminary bat hibernaculum	Parks Canada	1994
Winter avalanche weather monitoring	Parks Canada	1950's
Fire weather monitoring	Parks Canada	1920's
Lightning detection	Parks Canada	1992
Fire number and extent monitoring	Parks Canada	1920's
Aerial Caribou survey	Parks Canada	1993
Sow/cub Grizzly	Parks Canada	1991
Daily Bear monitoring	Parks Canada	1988
Roadside Elk survey	Parks Canada	1980's
Loon survey	Parks Canada and volunteers	1993
Breeding bird survey	Parks Canada	1980's
Christmas bird count	Parks Canada and volunteers	1979
Visitor statistics	Parks Canada	1980's
Trail use	Parks Canada	1994
Non-native weed distribution	Parks Canada	1992
Whistlers smoke monitoring	Parks Canada & Atmospheric Environment Service	1992
Toxic monitoring related to pulp mill	Parks Canada & Atmospheric Environment Service	1994
Regional air quality (West Central)	Parks Canada and industry	1993
Regional air quality (Rocky/Sundrie)	Parks Canada	1993
Inland water (watchdog agreement)	Parks Canada	1960's
Drinking water monitoring (bacteria, point source)	Parks Canada	1993
Sewage lagoon outlet - waste water monitoring	Parks Canada & DOE-Environmental Protection	1988
Stream gauging (water survey)	Parks Canada	approx. 1994
Contaminated sites (4 sites)	Parks Canada & DOE-Conservation & Protection	1992
Fuel tank inventory monitoring	Parks Canada	1992
Pesticides - application	Parks Canada	1986
Waste stream - garbage	Parks Canada	1992
Organochlorine (bioaccumulation)	Parks Canada & Inland Waters	1991
Mountain Pine Beetle & Douglas Fir Beetle	Parks Canada & Canadian Forestry Service	1991

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $__N.A.__ k + Non-salary $__N.A.__ k = Total $__437.0__ k, Error +/- __N.A.__ %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $__N.A.__ k + Non-salary $__N.A.__ k = Total $__N.A.__ k, Error +/- __N.A.__ %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Nothing reported.		

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
British Columbia Forest Service	Canada/B.C. Border Zone Agreement	approx. 1976
Alberta Forest Service	Canada/Alberta Border Zone Agreement	approx. 1972
Canadian Forestry Service	Fire Research and Fire Insect and Disease	approx. 1947

ANY COMMENTS ? Nothing reported.

Information compiled by: John Taylor and Rick Kubian. **Date:** 14/10/94

KEJIMKUJIK NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Piping Plover	APPRP & Parks Canada	1987
Blanding's marking	Parks Canada	1972
Blanding's nest	Parks Canada	1972
White-tailed deer	Parks Canada	1973
Pine marten	Parks Canada	1987
Loon/Waterfowl	Parks Canada & Canadian Wildlife Service	1977
Significant wildlife	Parks Canada	1966
Insects	Canadian Forestry Service	1966
Significant vegetation	Parks Canada	1966
Daily weather	Atmospheric Environment Service & Parks Canada	1966
Fire weather index	Parks Canada & Nova Scotia Department of Natural Resources	1966
Water quality	Parks Canada & Environment Canada	1978
Water quantity	Parks Canada & Environment Canada	approx. 1966
Acid precipitation	Environment Canada	1980

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 87.5 k + Non-salary $ 35.0 k = Total $ 122.5 k, Error +/- N.A. %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ N.A. k + Non-salary $ N.A. k = Total $ N.A. k, Error +/- N.A. %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Biodiversity plots	Parks Canada & another government department	1995
Data/information management	Parks Canada	1995
Microclimate	Parks Canada & Environment Canada	1995
Radiation	Parks Canada & Environment Canada	1995
Air pollutants	Environment Canada	1995
Ozone	Environment Canada	1995

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
Acadia University	Natural resources inventory management	1989
Nova Scotia College of Geographic Sciences	Ecosystem database development	1989
Environment Canada	Ecosystem management & inventory research	ongoing
Canadian Forestry Service	Forest insect and disease survey	ongoing

ANY COMMENTS ?

Nothing reported.

Information compiled by: Lary Brown
Date: 29/11/94

KLUANE NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Small stream survey	Department of Indian Affairs and Northern Development-Water Resources & Parks Canada	1993
Alsek River water quality	Environment Canada & Parks Canada	1992
Snow survey plots	Department of Indian Affairs and Northern Development-Water Resources & Parks Canada	198(
Kokanee salmon population status	Yukon Territorial Gov't-Fisheries & Parks Canada	197
Icefields mountaineering visitor use	Parks Canada	19
Alsek River rafting visitor use	Parks Canada	19
Wildfire occurrence	Yukon Forest Service & Parks Canada	19
White Spruce bark beetle infestation	Canadian Forestry Service & Parks Canada	1
Grizzly Bear research	Univ. of British Columbia & Parks Canada	1
Problem bear-closed area monitoring	Yukon Territorial Government, Canadian Wildlife Service, & Parks Canada	1
Mountain Goat population status	Parks Canada	7
Dall's Sheep population status	Parks Canada	74
Moose population status	Parks Canada	74
Wolf population status	Parks Canada	974
Raptor survey	Parks Canada	983
Opportunistic wildlife observations	Parks Canada	974
Cultural and archaeological site monitoring	Parks Canada	1974
Wilderness site monitoring	Parks Canada	1980
Surging glacier research	Dr. G. K. C. Clarke, Univ. of British Columb	1990
Dall's Sheep mortality	M. Hoefs & Parks Canada	1975

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 29.66 k + Non-salary $ 108.1 k = Total $ 137.76 k, Error + N.A. %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ N.A. k + Non-salary $ N.A. k = Total $ N.A. k , Error +/- N.A. %

FUTURE MONITORING

Title, description	Done by/with	Year starting

Since the reorganization of government and the formation of the new Yukon District, there is uncertainty regarding the future of current monitoring projects. We are assuming that the previously listed projects will continue to be funded, with the exception of the Alsek River water quality monitoring which has been completed.

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
The following is a list of co-operative agreements not included in the previous list of monitoring programs:		
University of British Columbia	Continuation of Bear Research agreement	1992
Arctic Institute of North America	Renewed	1994
Yukon Territorial Government	Wolf agreement	1993
	Peregrine Falcon agreement	1990
	Greater Kluane Bear Ecosystem Working Group	1989

ANY COMMENTS ?

Nothing reported.

Information compiled by: Bruce Sundbo and Andrew Lawrence. **Date:** 20/10/94

KOOTENAY NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Forest insects and disease survey	Canadian Forestry Service & Parks Canada	1935
Mountain Pine beetle survival	Parks Canada	1981
Non-native plant status	Parks Canada	1994
Breeding bird survey	Parks Canada for Canadian Wildlife Service	1981
Christmas bird counts	Parks Canada & B.C. Naturalist Federation	1978
Columbia valley bird survey	Parks Canada for B.C. Hydro	1993
Forest bird migration	Parks Canada for Canadian Wildlife Service	1994
Aerial sheep survey (spring)	Parks Canada & B.C. Wildlife	1989
Elk survey	Parks Canada	1974
Sheep survey	Parks Canada	1974
Water quality monitoring	Parks Canada & Environment Canada	1987
Water quality - health	Parks Canada & Health and Welfare Canada	1986
Snow surveys	Parks Canada & B.C. Ministry of Environment	1935
Wolf ecology and status	Parks Canada & contract	1992
Backcountry vegetation plots	Parks Canada	1987
Air visibility and particulates	Parks Canada & Environment Canada	1994
Benthic invertebrates	Parks Canada & National Hydrological Research Institute	1994
Biodiversity research - birds and small mammals	Parks Canada & U.B.C.	1993
Biodiversity research - amphibians	Parks Canada & U.B.C.	1994
Aspen ecology/photo repeats	Parks Canada & contract	1994
Grizzly Bear status and ecology	Parks Canada, B.C. Ministry of Environment, & B.C. Forest Service	1994

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 19.35 k + Non-salary $ 144.4 k = Total $ 163.75 k, Error +/- 10 %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ 63.84 k + Non-salary $ 109.0 k = Total $ 172.84 k , Error +/- 30 %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Badger population status and ecology	Parks Canada & B.C. Ministry of Environment	1995
Prescribed burn monitoring	Parks Canada	1995

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
B.C. Wildlife Branch	Bighorn Sheep co-op management	1990
U.B.C. Centre for Applied Conservation Biology	Biodiversity research	1993
National Hydrological Research Institute	Aquatic ecosystem research	1994
Environment Canada	Visibility monitoring	1994

ANY COMMENTS ?

(1) It is difficult to determine in many cases whether certain research activities qualify as "monitoring". In general, when in doubt, these activities are included. (2) In some monitoring activities the Park may have been a small player in a large, multi-agency project. The Park's costs were likely small, whereas costs to the lead agency were very high. These relationships are not evident when the figures are just totalled for all monitoring activities.

Information compiled by: Alan Dibb **Date:** 14/10/94

KOUCHIBOUGUAC NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Weather station	Atmospheric Environment Service	1970
Snow monitoring	Parks Canada	1979
Piping Plover nest count	APPRP & Canadian Wildlife Service	1988
Shorebird survey	Canadian Wildlife Service	1976
Wildlife observation cards	Parks Canada	1970
Indian burial ground erosion	Parks Canada	1984
Christmas bird count	Audubon Society	1970
Bear monitoring	Parks Canada	1989
Beaver activity	Parks Canada	1970
Maritime nest record	Canadian Wildlife Service	1978
Gypsy moth	Canadian Forestry Service	1984
Dune involvement	Parks Canada	1994
LRTAP	Inland Waters Directorate-Burlington	1994
Gulls and Terns	Parks Canada & Canadian Wildlife Service	1973
Ungulate aerial survey	Parks Canada	1973
Copper Kettle burial ground	Parks Canada	1983
Campground vegetation deterioration	Parks Canada	1994
ATV impacts	Parks Canada	1994

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 18.5 k + Non-salary $ 30.0 k = Total $ 48.5 k, Error +/- N.A. %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ N.A. k + Non-salary $ N.A. k = Total $ N.A. k, Error +/- N.A. %

FUTURE MONITORING

Title, description	Done by/with	Year starting
North Richibucto Dune camping monitoring	Parks Canada	1995
Amphibian population monitoring	Parks Canada & McGill University	1995
Water quality monitoring	Parks Canada & DOE Inland Waters Dir.	1995
Peat mining monitoring	Parks Canada & Université de Sherbrooke	1995
Health of ecosystems	Parks Canada	1995
Indian archaeological sites	Parks Canada & Université de Sherbrooke	1995
Ocean modelling	DFO & University of Moncton	1995

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
Université de Sherbrooke	Various research projects regarding cultural/heritage, vegetation, and wildlife resources	1992
Université de Moncton	Various research projects regarding cultural/heritage, vegetation, and wildlife resources	1991
McGill University	Wildlife research	1992
College Communautaire de Bathurst	Pollution	1993
College Environnemental de Neuvec France	Pollution	1994

ANY COMMENTS ?

Nothing reported.

Information compiled by: Lary Brown

Date: 29/11/94

PARC NATIONAL DE LA MAURICIE

LA SURVEILLANCE ACTUELLE (1994-1995)

Titre, description	Fait par/avec	Depuis quelle année
Monitoring et éradication de la Salicaire pourpre	Parcs Canada	1992
Monitoring et éradication de l'Herbe à poux	Parcs Canada	1990
Régénération forestière après feu dirigé	Parcs Canada	1991
Météorologie forestière	Parcs Canada	1991
Suivi de la population d'Ours noir	Parcs Canada	1993
Suivi de l'exploitation par la pêche sportive	Parcs Canada	1974
Suivi de l'impact de l'utilisation humaine	Parcs Canada	1980
Suivi de l'avifaune	Parcs Canada	1982
Suivi de la population d'Huart à collier	Parcs Canada	1987
Suivi de la nidification du Grand Heron	Parcs Canada	1992
Suivi des populations de castors	Parcs Canada	1976
Présence du Loup sur le territoire	Parcs Canada	1992
Suivi des populations d'ongulés	Parcs Canada	1971
Suivi de l'herpétofaune	Parcs Canada	1983
Réseau spatial de surveillance des lacs du Québec	Direction des eaux intérieures Centre Saint-Laurent-Environnement Canada	1983
Étude à long terme de la réponse biologique des habitats aquatiques face aux dépôts acides	Division de l'habitat du poisson, Institut Maurice-Lamontagne-Pêches et Océans	1987
Évaluation de la qualité des eaux de baignade	Service de l'hygiène du milieu-Santé Canada	1980

COÛTS DE LA SURVEILLANCE ACTUELLE (1994-95)

ESTIMATION DU COÛT AU PARC

Salaire $ 81.0 k + Non-salaire $ 203.0 k = Total $ 284.0 k, Erreur +/- 10 %

ESTIMATION DU COÛT AUX AUTRES AGENCES

Salary $ 5.0 k + Non-salaire $ 15.0 k = Total $ 20.0 k, Erreur +/- 50 %

LA SURVEILLANCE PRÉVUE

Titre, description	Fait par/avec	Depuis quelle année
Monitoring des communautés et des populations de poissons	Parcs Canada	1995-1996

ENTENTES COOPÉRATIVES, ACTUELLES ET POTENTIELLES

Organisme	Sujet	Depuis quelle année
Direction des eaux intérieures Centre Saint-Laurent-Environnement Canada (Réseau TADPA)	Réseau spatial de surveillance des lacs du Québec	1983
Division de l'habitat du poisson Institut Maurice-Lamontagne-Pêches et Océans	Étude à long terme de la réponse biologique des habitats aquatiques face aux dépôts acides	1987
Service de l'hygiène du milieu-Santé Canada	Evaluation de la qualitédes eaux de baignade	1980
Min. des ressources naturelles Québec de l'épinette et du sapin	Suivi de la population de la Tordeuse des bourgeons	1970
Min. des ressources naturelles Québec forestiers	Suivi de l'evolution de certains peuplements	1970

DES COMMENTAIRES ?

D'autres formes de suivi seront éventuellement mises en place au cours des prochaines années à la suite de la finalisation et de l'acceptation des plans de gestion des écosystèmes terrestres et aquatiques.

Information compileé par: Michel Plante, Garde de park
Date: 18/10/94

PARC NATIONAL DE L'ARCHIPEL DE MINGAN

LA SURVEILLANCE ACTUELLE (1994-1995)

Titre, description	Fait par/avec	Depuis quelle année
Programme de suivi des oiseaux marins	Parcs Canada	1993
Suivi et rétablissement des secteurs d'activité	Parcs Canada	1993
Suivi des plantes d'intérêt	Parcs Canada	1993

COÛTS DE LA SURVEILLANCE ACTUELLE (1994-95)

ESTIMATION DU COÛT AU PARC

Salaire $__20.0__ k + Non-salaire $__S/O__ k = Total $__20.0__ k, Erreur +/- __S/O__ %

ESTIMATION DU COÛT AUX AUTRES AGENCES

Salary $__S/O__ k + Non-salaire $__S/O__ k = Total $__S/O__ k, Erreur +/- __S/O__ %

LA SURVEILLANCE PRÉVUE

Titre, description	Fait par/avec	Depuis quelle année
Surveillance de l'intégrité écologique	Parcs Canada	1997

ENTENTES COOPÉRATIVES, ACTUELLES ET POTENTIELLES

Organisme	Sujet	Depuis quelle année
Jardin Botanique de Montréal artificielle d'esèces floristiques d'intérêt	prélèvement, mise en valeur et conservation	1991

DES COMMENTAIRES ?

Sans observation

Information compileé par: Yvon Grenier, Garde de parc

Date: 17/10/94

MOUNT REVELSTOKE NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Monitoring avian productivity and survivorship	Parks Canada, Canadian Wildlife Service, & Friends of Mt. Revelstoke	1993
Caribou population	Parks Canada, Ministry of Forests, & Ministry of Environment, Lands, and Parks	1991
Bear population	Parks Canada	1960's
Mount Revelstoke climate station	Atmospheric Environment Service & B.C. Hydro	1993
Traffic monitoring	Parks Canada	1962
Trail monitoring	Parks Canada	approx. 1976
Facility use monitoring	Parks Canada	1962
Drinking water sampling	Parks Canada & Public Health	1960's
Forest fire monitoring	Parks Canada & B.C. Ministry of Forests	unknown
Forest insect and disease monitoring	Parks Canada & Canadian Forestry Service	1993
Noxious weed monitoring	Parks Canada	unknown
Roadkill monitoring	Parks Canada & Ministry of Transportation	1960's

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ N.A. k + Non-salary $ N.A. k = Total $ 50.0 k, Error +/- N.A. %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ N.A. k + Non-salary $ N.A. k = Total $ N.A. k, Error +/- N.A. %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Old growth Bat populations	B.C. Hydro	1995 or later

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
B.C. Hydro	Caribou, Bears, Bats, Wolverine populations	1992
B.C. Hydro	Climate	1992
B.C. Hydro	Avalanche ecology	1992
B.C. Ministry of Forests	Caribou, Bears, Wolves, wildlife, & trees	1992
B.C. Ministry of Environment, Lands, and Parks	Caribou, Bears, Wolverines, Bats, wildlife, & trees	1992
Canadian Wildlife Service	Neotropical migrant monitoring	1992
Friends of Mt. Revelstoke/Glacier	All of the above	1993
Inland Waters	Glacier studies	1972
North Columbia Mtns Ecological Research Group	All of the above	1993
University of British Columbia	Forest fragmentation	1993
B.C. Ministry of Transportation	Impact of roads	potential

ANY COMMENTS ?

Nothing reported.

Information compiled by: John G. Woods, Faunal Specialist
Date: 28/11/94

NAHANNI NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Red Necked Grebe monitoring for air traffic and human use impacts	Parks Canada	1986
Arctic Loon monitoring for air traffic and human use impacts	Parks Canada	1986
Upland Sandpiper monitoring for human use impacts	Parks Canada	1983
Trumpeter Swan status	Parks Canada	1985
Weather	Inland Waters, Atmos. Env't Serv. & Parks Can	1993
Anuran monitoring for range and developmental phenology	Canadian Wildlife Service & Parks Canada	1993
Decomposition rates at permanent plots	Parks Canada	1994
Standing biomass production at permanent plots	Parks Canada	1994
Water quality	DFO, Parks Canada & Inland Waters	1988

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 30.0 k + Non-salary $ 29.0 k = Total $ 59.0 k, Error +/- N.A. %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ N.A. k + Non-salary $ N.A. k = Total $ 20.0 k , Error +/- N.A. %

FUTURE MONITORING

Title, description	Done by/with	Year starting
No plans for future monitoring have been formally endorsed by Nahanni National Park.		

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
Inland Waters Directorate	Water quality monitoring - South Nahanni River	1987
Canadian Wildlife Service	Trumpeter Swan monitoring	1985
Atmos. Env't Service & Inland Waters Directorate	Weather data collection	1993

ANY COMMENTS ?

Nahanni does have informal monitoring plans for the future at this time. These include the following: International Tundra Experiment; flowering plant phenology, monitoring of successional pathways, and breeding bird monitoring.

Information compiled by: Christian Bucher, Park Warden

Date: 07/10/94

NORTH BAFFIN NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description **Done by/with** **Year started**

A number of Polar Continental Shelf Project scientific programs are operating in and around the proposed North Baffin National Park. There is a lot of potential for future co-operative programs with the Canadian Wildlife Service, DFO, the Government of the N.W.T., and the Department of Renewable Resources.

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $___N.A.___ k + Non-salary $___N.A.___ k = Total $___N.A.___ k, Error +/- ___N.A.___ %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $___N.A.___ k + Non-salary $___N.A.___ k = Total $___N.A.___ k, Error +/- ___N.A.___ %

FUTURE MONITORING

Title, description **Done by/with** **Year starting**

See comments below.

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency **Subject** **Year started**

See comments below.

ANY COMMENTS ?

Much of what needs to be done for North Baffin will fall out of the Natural Resource Management Process -- Basic Resource Inventory, Resource Description and Analysis, etc. -- once the park is initiated. No park staff or resources at present are being used at North Baffin; looks as if it will be at least 1996 or probably later before any staff come on stream.

Information compiled by: Renee Wissink

Date: 07/10/94

PACIFIC RIM NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Kelp distribution-Barkley Sound	Parks Canada & Bamfield Marine Station	1993
Marbled Murrelet surveys	Parks Canada & University of Victoria	1993
Pelagic seabird surveys	Parks Canada	1992

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 3.5 k + Non-salary $ 35.5 k = Total $ 39.0 k, Error +/- 10 %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ 16.0 k + Non-salary $ 8.0 k = Total $ 24.0 k, Error +/- 10 %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Marbled Murrelet surveys	University of Victoria	1993
Pelagic seabird surveys	Parks Canada	1992

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
Bamfield Marine Station	Kelp genetic diversity	1993
Bamfield Marine Station & DFO	Euphauslid dynamics	1993
Department of Fisheries and Oceans	Herring population model	1993
Long Beach model forest	Riparian ecosystems	1995

ANY COMMENTS ?

The ecosystem conservation plan is in draft form. More monitoring will likely devolve from the finalization of the Ecosystem Conservation Plan and development of a monitoring plan.

Information compiled by: John McIntosh

Date: 01/12/94

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Eastern Fox Snake population monitoring	Parks Canada & University of Windsor	1980
Eastern Mole population status	Parks Canada	1986
White-tailed Deer population status	Parks Canada	1985
Rare vegetation monitoring plots	Parks Canada & various researchers	1985
Carolinian forest monitoring	Parks Canada	1987
Organic precipitation sampling	Atmospheric Environment Service & Parks Canada	1994
Inorganic precipitation sampling	Atmospheric Environment Service & Parks Canada	1994
Southern Flying Squirrel population status	Parks Canada & University of Guelph	1993
Fauna road kill monitoring	Parks Canada	1979
Water quality and contaminant monitoring	Parks Canada, Great Lakes Institute, DOE Ecosystem Health Division and University of Waterloo	1984
Shoreline variations and processes	University of Windsor	1978
Five-lined Skink population ecology	University of Windsor	1989
Amphibian and Reptile monitoring	Parks Canada	1981
Amphibian distribution and status	University of Windsor	1992
Forest Bird monitoring	Parks Canada	1994
Restoration of disturbed and impacted areas	Parks Canada	1989
Green house gas generation, consumption and transport/ nitrogen cycling in wetland ecosystems	Environment Canada	1993
Lepidopteran surveys	Various contractors/researchers	1985
Shoreline erosion aerial photography	Parks Canada	1985
Vegetation succession in disturbed dryland habitats	York University	1994
Forest insect monitoring	Canadian Forestry Service/Parks Canada	1988

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 10.5 k + Non-salary $ 55.5 k = Total $ 66.0 k, Error +/- 10 %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ N.A. k + Non-salary $ N.A. k = Total $ N.A. k, Error +/- N.A. %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Breeding Bird transects	Parks Canada/contractor/volunteers	1995
Ecosystem status monitoring	Parks Canada/contractor	1995
Air quality monitoring	Parks Canada/Atmospheric Environment Service	1995
Dune restoration site monitoring	Parks Canada	1995

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
Friends of Point Pelee	Ecosystem restoration/exotic vegetation control	1990
Friends of Point Pelee	Southern Flying Squirrel re-introduction	1992
University of Windsor	Amphibian status & distribution research/monitoring	1992
University of Windsor	Eastern Fox Snake ecology	1992
University of Windsor	Five-Lined Skink status, distribution & human disturbance	1990
University of Windsor	Shoreline processes and variations	1979
McMaster University	Five-Lined Skink genetics research	1995
University of Windsor/or University of Guelph	Small mammal population status & distribution	1996

ANY COMMENTS ? Nothing reported.

Information compiled by: Tom Linke, Park Warden.

Date: 18/10/94

PRINCE EDWARD ISLAND NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Piping Plover/Common Tern survey	Parks Canada	1980
Gypsy Moth survey	Natural Resources Canada & Parks Canada	1980
Maritime International Shorebird survey	Canadian Wildlife Service & Parks Canada	1983
Forest insect and disease survey	Natural Resources Canada	1985
Red Pine/Yellow Birch Plantation	Prov. and Fed. Forestry	1985
Aerial photography	Parks Canada & Provincial Forestry	1937
Climate monitoring	Parks Canada & Environment Canada	1992
Sand dune profiles/topology	Parks Canada	1992
Coastal sediment transport	Parks Canada & Geological Survey of Canada	1992
Aster laurentianus survey	Parks Canada	1986
Herptile inventory	Parks Canada	1981
Avifauna survey	Parks Canada	1978
Wildlife observation notes	Parks Canada	1978
Christmas Bird count	Parks Canada & Canadian Wildlife Service	1980
Purple Loosestrife monitoring/eradication	Parks Canada	1993
Ground water quality	Parks Canada	1980
Cavendish sewage system water quality	Parks Canada	1994
Permanent vegetation plots	Parks Canada	1978
Sand dune rehabilitation	Parks Canada	1980
Occurrence Tracking & Information System	Parks Canada	1982
Shoreline erosion survey	Provincial Environment	1965
Muskrat hut survey	Parks Canada	1978

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 20.1 k + Non-salary $ 129.0 k = Total $ 149.1 k, Error +/- 20 %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ N.A. k + Non-salary $ N.A. k = Total $ N.A. k, Error +/- N.A. %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Trace elements survey	Environment Canada or contract	1995/96

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
Holland College	GIS database development	1991
Natural Resources Canada	Forest insect and disease monitoring	ongoing
Holland College	Monitoring *Aster lautentinus*	1994

ANY COMMENTS ?

Nothing reported.

Information compiled by: Lary Brown
Date: 25/11/94

PRINCE ALBERT NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Snow melt cover	Atmospheric Environment Service & Parks Canada	1994
Hydrology	Atmospheric Environment Service & Parks Canada	1994
Acid Rain National Early Warning System (ARNEWS)	Canadian Forestry Service	1993
Spruce Budworm monitoring	Forestry Branch - Sask. Env't & Resource Mgmt	1993
Christmas bird count	Nature Saskatchewan & Parks Canada	1975
Christmas mammal count	Nature Saskatchewan & Parks Canada	1975
Forest bird monitoring	Canadian Wildlife Service	1990
Songbird nest predation monitoring	Parks Canada & Canadian Wildlife Service	1993
Waterfowl census	US Fish and Wildlife Service	1980
Snow transect	Parks Canada	1970
Forest age class structure	Parks Canada	1991
Gradient analysis	NBIOME, University of Calgary, En. Innovations, Green Plan, & NSERC	1993
Global energy and water cycle experiment (GEWEX)	National Hydrology and Research Centre	1992
Water quality and trophic status	National Hydrology and Research Centre, Sask. Research Council, & Parks Canada	1990
Fish population monitoring	Parks Canada	1993
Creel survey	Parks Canada	1993
Water quality of Waskesiu Beach	Parks Canada & Saskatchewan Research Council	1990
Water levels, Waskesiu & Kingsmere Lakes	Inland Waters Directorate & Parks Can	1990

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 101.0 k + Non-salary $ 66.80 k = Total $ 167.80 k, Error +/- 30-50 %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ N.A. k + Non-salary $ N.A. k = Total $ 103.30 k, Error +/- 70 %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Wildlife monitoring	Parks Canada	1995

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
NASA	Earth Observing System	1993
Boreal Ecosystem-Atmosphere Study international, multi-agency	To measure the role of the boreal forest in climate change	1993
Conservation Data Centre	To track the status of vulnerable species	1993
Sask. Parks & Renewable Resources, Weyerhaeuser Canada Ltd, Federation of Sask. Indian Nations, Prince Albert Tribal Council, Montreal Lake Indian Band, Sask. Section CI/IFC, & Lac La Range Indian Band	Model forest	1992
Weyerhaeuser Canada Ltd, Wildlife Habitat Canada, Sask. Wildlife Federation, & the Province of Sask	Saskatchewan Forest Habitat Project	1991
University of Calgary, Environmental Innovations, and Green Plan	N. Biosphere Obs'n & Modelling Experiment	1993
National Hydrology and Research Centre	Global Energy and Water Cycle Experiment	1992

ANY COMMENTS ?

Nothing reported.

Information compiled by: Jen Theberge, Park Warden. **Date:** 02/11/94

PUKASKWA NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Weather stations	Parks Canada & Atmospheric Environment Service	1977
Archaeological: Pukaskwa pits	Parks Canada	1984
Aquatic resources inventory	Parks Canada & Canada Centre for Inland Waters	1990
Water quality	Parks Canada & Canada Centre for Inland Waters	1987
Acid sensitivity sampling in lakes	Parks Canada & Canada Centre for Inland Waters	1991
Lamprey monitoring	Department of Fisheries and Oceans	1978 & 1992
Steelhead assessment coastal streams	Ont. Min. Nat. Resources & Parks Can.	1992 & 1993
Colonial nesting birds	Canadian Wildlife Service & Parks Canada	1978 to 1981 and 1989 to 1991
Rare plants	Parks Canada	1981
Moose census	Canadian Wildlife Service & Parks Canada	1973
Caribou census	Canadian Wildlife Service & Parks Canada	1972
EARP (Environmental Assessment Review Process)	Parks Canada	as required
Superior lake watch: sechi disc	Parks Canada	1992
Backcountry visitation	Parks Canada	1980
Total park visitation	Parks Canada	1980
Forest insect and disease survey	Canadian Forestry Service	1980`s
Satellite imagery	Lucaris	1985 & 1989
Wildlife observation card system	Parks Canada	1972
Traditional native harvest	Parks Canada	1973

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 35.0 k + Non-salary $ 70.0 k = Total $ 105.0 k, Error +/- 50 %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ 15.0 k + Non-salary $ 50.0 k = Total $ 65.0 k, Error +/- 75 %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Forest successional monitoring plots	Parks Canada	approx. 1995
Breeding birds survey	Canadian Wildlife Service & Parks Canada	approx. 1995
Small mammals survey	Parks Canada	approx. 1995
Satellite imagery	Lucaris	unknown

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
Lakehead University School of Forestry	Vegetation change analysis	1995
Canada Centre for Inland Waters	Water quality monitoring	continuing
Atmospheric Environment Service	Weather radio service	1985, update 1991
Ontario Ministry of Natural Resources	Wildlife monitoring	1976, update 1992

ANY COMMENTS ?

Nothing reported.

Information compiled by: Keith D. Wade, Park Warden

Date: 08/11/94

RIDING MOUNTAIN NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Wolf track surveys	Parks Canada	1982
Rare game observations	Parks Canada	1983
Large bird nesting survey	Parks Canada	1979
Beaver cache survey	Parks Canada	1980
Ungulate population survey	Parks Canada	1974
Ungulate age/sex survey	Parks Canada	1980
Ungulate kill data (to determine poaching)	Parks Canada	1980
Prescribed burn shrub recovery	Parks Canada	1994
Fescue permanent plots	University of Manitoba	1973
Weather monitoring	Atmospheric Environment Service & Parks Canada	1987, automated in 1991
Fire weather monitoring	Atmospheric Env't Service & Parks Canada	1987
Forest pest and disease inventory	Canadian Forestry Service	1985
Snow depth (to determine winter severity for ungulates)	Parks Canada	1973
Water quality	Parks Canada	1986
Ground water testing (again, for water quality)	Parks Canada	1993
Hydrology (to determine turnover rates at Clear Lake)	Parks Canada	1994

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 40.0 k + Non-salary $ 50.0 k = Total $ 90.0 k, Error +/- 5 %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ 10.0 k + Non-salary $ 5.0 k = Total $ 15.0 k , Error +/- 50 %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Nothing reported.		

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
McMaster University	Genetic testing of blood samples	1993
Brandon University	Sediment coring - Pb and Zn	1994

ANY COMMENTS ?

Nothing reported.

Information compiled by: Stephen McCanny

Date: 14/10/94

SAGUENAY-ST. LAWRENCE NATIONAL MARINE PARK

LA SURVEILLANCE ACTUELLE (1994-1995)

Titre, description	Fait par/avec	Depuis quelle année
Statut de la population de Phoques communs	Parcs Canada & Pêches et Océans	1992

COÛTS DE LA SURVEILLANCE ACTUELLE (1994-95)

ESTIMATION DU COÛT AU PARC

Salaire $__1.2__ k + Non-salaire $__0.3.__ k = Total $__1.5__ k, Erreur +/- __10__ %

ESTIMATION DU COÛT AUX AUTRES AGENCES

Salary $__S/O__ k + Non-salaire $__S/O__ k = Total $__25__ k, Erreur +/- __S/O__ %

LA SURVEILLANCE PRÉVUE

Titre, description	Fait par/avec	Depuis quelle année
Sans observation		

ENTENTES COOPÉRATIVES, ACTUELLES ET POTENTIELLES

Organisme	Sujet	Depuis quelle année
Groupe de recherche et d'éducation sur le milieu marin (GREMM)	Distribution et structure de la population de Béluga du Saint-Laurent	1994
Pêches & Océans - IML, Serv. Canadien de la Faune, GREMM et Min. Env. & Faune du Québec (MEF)	Étude de comportement des Rorquals communs dans l'estuaire maritime du Saint-Laurent	1994
Service Canadien de la Faune	Détermination de la fréquentation des oiseaux marins et côtiers dans une portion marine du parc marin du Saguenay	1993
Pêches et Océans - Instutut Maurice-Lamontagne (IML)	Recherche en pêcherie et gestion; coopération et échange de services	1991
IML et MEF	Suivi de l'activité de la pêche	S/O
Alcan, Societé touristique du fjord, 6 associations de pêcheurs, 11 partenaires	Sportive hivernale (pêche blanche) sur la rivière (trançon ville de St-Fulgunce à l'Anse Saint-Jean) de 1994-1999	1994

DES COMMENTAIRES ?

Sans observation

Information compileé par: Suzan Dionne, Conseillère scientifique

Date: 17/10/94

ST. LAWRENCE ISLANDS NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Herptile diversity-permanent plots	Parks Canada	1994
Deer Berry vigour-permanent plots	Parks Canada	1994
Beech Beam vigour-permanent plots	Parks Canada	1994
Pitch Pine vigour-permanent plots	Parks Canada	1974
Weather-automated station	Atmospheric Environment Service & Parks Canada	1970
Aerial deer survey	Parks Canada	1991
Tern nesting success-island survey	Canadian Wildlife Service & Parks Canada	1982
Bald Eagle survey	DFO & Parks Canada	1991
Purple Loosestrife permanent plots	Parks Canada	1991

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 28.0 k + Non-salary $ 3.5 k = Total $ 31.5 k, Error +/- 15 %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ N.A. k + Non-salary $ N.A. k = Total $ N.A. k, Error +/- N.A. %

FUTURE MONITORING

Title, description	Done by/with	Year starting

The Monitoring Plan for the greater Saint Lawrence Islands National Park ecosystem area is to be completed this winter. All future monitoring in the ecosystem will be subject to this plan.

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
Ontario Ministry of Natural Resources	Pitch Pine genetic research	1994
Agriculture Canada	Insect inventory	1994
Sir Sanford Fleming College (Lindsay)	Digital air photo interpretation	1994
Ont. Min. Natural Resources, Cataraqui Conservation Authority, New York Dept. of Env. Conservation & St. Lawrence Eastern Ont. Commission, U.S.	Greater St. Lawrence Islands ecosystem protection	1994

ANY COMMENTS ?

St. Lawrence Islands National Park is currently in the approval stages of the Park's ecosystem based Conservation Plan.

Information compiled by: Jeff Leggo

Date: 07/11/94

TERRA NOVA NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Water quality - Long Range Transport of Acid Precipitation	Atmospheric Environment Service & Newfoundland Department of Environment	1984
Water quality - NW River	Parks Canada & Environment Canada	1991
Water quality	Environment Canada & Newfoundland Department of Environment	1970
Water level gauging	Environment Canada & Newfoundland Department of Environment	1977
Avifauna shorebird surveys	Parks Canada	early 1970's
Avifauna Christmas count	Parks Canada & volunteers	early 1970's
Avifauna Terns	Parks Canada	1972
Moose vehicle	Parks Canada	1980's
Meterological data	Atmospheric Environment Service	1966
Salmon/creel census (NW River patrols)	Parks Canada & DFO	early 1970's
Vegetation plots	Parks Canada	1974
Fire weather	Newfoundland Department of Natural Resources	1960
Wildlife observations	Parks Canada	1978
Tract transects	Parks Canada	early 1970's

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ N.A. k + Non-salary $ N.A. k = Total $ N.A. k, Error +/- N.A. %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ N.A. k + Non-salary $ N.A. k = Total $ N.A. k, Error +/- N.A. %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Nothing reported.		

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
Memorial University - J. Lien	Operational research/mutual collaboration	1989
Natural Resources Canada	Annual forest insect and disease surveys	ongoing
NFLD Department of Environment and Lands	Wildlife research studies	1993
Coast Guard Canada	Rescue base - facilities	unknown
Royal Canadian Mounted Police	Search and rescue operations	approx. 1994
Environment Canada	Acid precipitation - LRTAP	unknown
Heritage Foundation	Resource conservation temporary personnel and equipment	approx. 1991
Environment Canada	Infrastructure support and water quality	approx. 1991
Newfoundland Department of Forests and Agriculture	Fire suppression	approx. 1993

ANY COMMENTS ?

Nothing reported.

Information compiled by: Lary Brown

Date: 25/11/94

VUNTUT NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Porcupine Caribou herd status	Canadian Wildlife Service (CWS), Yukon Territorial Government (YTG) Renewable Resources, U.S. Fish and Wildlife Service, & Alaska Fish and Wildlife Service	1978
Caribou oversummer condition	CWS & U.S. Fish and Wildlife Service	1992
Caribou condition monitoring	YTG Renewable Resources	approx. 1990
Migratory waterfowl banding and habitat assessment	CWS, Vuntut Gwitchin First Nations & U.S. Fish and Wildlife Service	1994

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ N.A. k + Non-salary $ N.A. k = Total $ N.A. k, Error +/- N.A. %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ N.A. k + Non-salary $ N.A. k = Total $ N.A. k, Error +/- N.A. %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Nothing reported.		

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
Nothing reported.		

ANY COMMENTS ?

Most of the projects indicated are not focused on Vuntut National Park, but are ongoing within the 'greater park ecosystem'. All have some activity in the Park. All costs at this time are subsets of larger projects; no Vuntut specific costs are broken down at this time.

Information compiled by: Duane West

Date: 29/11/94

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Air quality monitoring	Parks Canada & Atmospheric Environment Service	1993
Archaeological assessment of selected sites	Parks Canada	approx. 1980
Salvage archaeology	Parks Canada	approx. 1993
Backcountry recapitalization project	Parks Canada	1992
Horse use trail impact monitoring	Parks Canada	approx. 1989
Climatological monitoring	Parks Canada, Atmospheric Environment Service & Alberta Environment	approx. 1940
Fire weather monitoring	Parks Canada, Atmospheric Environment Service, & Alberta Environment	1940
Avalanche hazard forecasting	Parks Canada, Atmospheric Environment Service, & Alberta Environment	approx. 1975
Flowering plant phenology and weather (climate change)	University of Alberta & Agriculture Canada	1987
Reconstructing Holocene environmental/climate changes	University of Western Ontario	1992
Bumble Bee foraging behaviour study	University of Calgary	1992
Bumble Bee population study	Agriculture Canada	1990
Wood tick study	University of Saskatchewan	1991
Forest service insect trapping	Canadian Forestry Service	1978
Environmental assessment projects	Parks Canada	ongoing
Fire history project	Parks Canada & Mr. Steve Barrett	1993
Prescribed burning	Parks Canada, MD Pincher Creek, B.C. Forest Service, Alberta Forest Service, & Glacier National Park (Montana)	1989
Creel survey	Parks Canada & Lethbridge Community College Natural Resource Institute	1993
Toxicological study of fish-Middle Waterton Lake	Inland Waters Directorate	1992
Geology of the Sullivan evaporate deposit and surrounds	Geological Survey of Canada	approx. 1990
Seismography	Geological Survey of Canada	approx. 1990
Trilobite biostratigraphy and sedimentology	University of Saskatchewan	approx. 1988
Rock slide hazard project	University of Alberta	1993
Tree hazard assessment	Parks Canada	1991
Bio-control of Spotted Knapweed	Agriculture Canada & Parks Canada	1994
Ecological land classification and vegetation mapping	Parks Canada	1994
Ecology of Trembling Aspen	State University of New York	approx. 1991
Huckleberry monitoring plots	Parks Canada & Glacier National Park (Montana)	approx. 1989
Knapweed monitoring project	Parks Canada & Agriculture Canada	1978
Rare Grapfern sp. (*Botruchium paradoxum*) monitoring	Parks Canada & Montana Natural Heritage Program	1989
Spring flora count	Parks Canada & Federation of Alberta Naturalists	approx. 1977
Transect in Bison paddock	Parks Canada	approx. 1985
Wildflower monitoring project	Parks Canada & Alberta Fish and Wildlife	approx. 1987
Fresh water sampling-levels, quality, fish toxicology	Inland Waters Directorate & Parks Canada	1992
Antler marking program	Parks Canada	1991
Bear monitoring program	Parks Canada & Glacier National Park (Montana)	approx. 1984
Bird counts	Parks Canada & Federation of Alberta Naturalists	approx. 1987

Ecology and distribution of Elk	Parks Canada, University of Alberta, Shell Resource Canada, and Alberta Forestry - Lands & Wildlife 1991
Harlequin duck survey	Parks Canada 1992
Molecular genetic research & DNA repository (wildlife)	Parks Canada & University of Alberta 1992
Role of predation - White-tailed & Mule Deer	Parks Canada & University of Calgary 1993
Salamander study	Parks Canada & University of Calgary 1993
Trumpeter Swan monitoring	Canadian Wildlife Service & United States Fish and Wildlife Service 1976
Wolf studies	Parks Canada, Alberta Fish and Wildlife, United States Fish and Wildlife Service, & Glacier National Park, Blackfeet Indian Reservation (both in Montana) 1994

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $__N.A.__ k + Non-salary $__N.A.__ k = Total $__30.0__ k, Error +/- __N.A.__ %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $__N.A.__ k + Non-salary $__N.A.__ k = Total $__100.0__ k, Error +/- __N.A.__ %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Bull trout spawning populations	Alberta Fish and Wildlife Service	1995
Biodiversity plots (out of park)	Local landowners	1996
Biodiversity plots (in park)	Lethbridge Community College	1996
Socio-economic indicators	Crown of the Continent Society	1995
Land use change (in the whole area)	Crown of the Continent Society - data atlas	1995

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
Atmospheric Environment Service	Climate stations and two air quality monitoring sites	1995
Lethbridge Community College	Joint efforts - monitoring by students *etc.*	1994
University of Lethbridge	Training/monitoring studies	1994
Canadian Parks and Wilderness Society, University of Calgary and University of Montana	Crown of the Continent data atlas (electronic GIS e	1994

ANY COMMENTS ?

Most dates and numbers are estimates -- cannot justify the time required to dig them out. Lack of ready accessibility is a red flag -- we will work to improve.

Information compiled by: K. Van Tighem and Rob Watt.

Date: 14/10/94

WOOD BUFFALO NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Peace-Athabasca Delta permanent vegetation transects and plots	Parks Canada	1993
Timber Berth 408 permanent vegetation plots and transects	Parks Canada	1993
Bison annual count	Parks Canada	early 1970's
Bison segregation count	Parks Canada	early 1970's
Whooping Cranes	Canadian Wildlife Service, Parks Canada, Alberta Fish & Wildlife, International Crane, & U.S. Fish and Wildlife Service	1957
Peregrine Falcons	Parks Canada	early 1980's
Peace River water quality monitoring	Inland Waters Directorate & Parks Canada	1950's
Peace River water flow monitoring	Inland Waters Directorate	1950's
Fire weather	Parks Canada, Government of the Northwest Territories, & Alberta Government	1950's
Fur sales	Parks Canada, Government of the Northwest Territories, & Alberta Fish & Wildlife Service	1950's

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 122.0 k + Non-salary $ 134.0 k = Total $ 256.0 k, Error +/- 5 %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ N.A. k + Non-salary $ N.A. k = Total $ N.A. k, Error +/- N.A. %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Nothing reported.		

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
University of Alberta	Mycorrhiza in Timber Berth 408	1994

ANY COMMENTS ?

Nothing reported.

Information compiled by: Kevin Timoney

Date: 01/11/94

YOHO NATIONAL PARK

CURRENT MONITORING (1994-95)

Title, description	Done by/with	Year started
Water monitoring	Parks Canada & Environment Canada	1987
Weather/climate	Atmospheric Environment Service	1970
Airborne contaminants	Parks Canada & Inland Waters Directorate	1987
Snowcourse water quality	B.C. Ministry of Environment	1960
Stream water	Inland Waters Directorate	1970
Forest insects and disease	Canadian Forestry Service & Parks Canada	1980
Water quality	Parks Canada & Health Canada	1987
Wildlife observations	Parks Canada & Agriculture Canada (ANSIS)	1940
Bear observations	Parks Canada	1985
Roadstrike monitoring	Parks Canada	1977
Wildlife sign	Parks Canada	1994
Bird counts (christmas and summer)	Parks Canada, Friends of Yoho, & private	1994
Trail impacts	Parks Canada	1988
Elk roadside transect	Parks Canada	1987

COSTS OF CURRENT MONITORING (1994-95)

ESTIMATE OF COST TO THE PARK

Salary $ 30.0 k + Non-salary $ 14.0 k = Total $ 44.0 k, Error +/- 10 %

ESTIMATE OF COST TO OTHER AGENCIES

Salary $ 25.0 k + Non-salary $ 15.0 k = Total $ 40.0 k, Error +/- 30 %

FUTURE MONITORING

Title, description	Done by/with	Year starting
Wolverine	Parks Canada and University of Calgary	1995
Wolf	Parks Canada and contract	1995

RELATED COOPERATIVE AGREEMENTS, PRESENT AND POTENTIAL

Agency	Subject	Year started
University of British Columbia	Biodiversity research	1993
University of Calgary & World Wildlife Fund	Bear/human management	1993

ANY COMMENTS ?

Nothing reported.

Information compiled by: Derek Petersen

Date: 11/10/94