

SPECIAL BULLETIN

MAKING A WILDLIFE DATA CENTRE WORK - HISTORY, OBJECTIVES, AND SOLUTIONS FOR SHARING DATA

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Introduction

Data and information sharing is a specified objective of the Biodiversity Centre for Wildlife Studies (BCFWS), but such a seemingly simple concept is rife with challenges. Our collections have a long history that date back before BCFWS was ever imagined, and our data holdings include contributions from a variety of stakeholders that have varying opinions about how their data may or may not be used. These stakeholders include individuals, non-profit organizations, government and non-government offices, small businesses, industry, wildlife consultants, researchers from academic and technical institutions, photographers, news reporters, and nature writers. Collectively, a huge investment has been made by everyone involved, but it was the vision and support of a few individuals that worked diligently and tirelessly to achieve now what may be the largest wildlife records collection in North America for a single province or state (Figure 1). The purpose of this report is to:

- 1) share with everyone the history that has brought us to where we are now, and to set the record straight on how data and information was obtained, compiled, and archived;
- 2) identify our data, contributors, and users and classify some of the challenges encountered in creating a functional and amicable data-sharing policy with contributors and users;
- 3) identify our costs, and a cost recovery plan, for sustaining BCFWS and the services and operations it intends to provide; and

- 4) enable a cost-effective data-sharing policy for contributors and users that will facilitate a multi-user data-sharing process for the betterment of wildlife research, management, and conservation.

Wildlife Databases: History and Vision

For over four decades the concept of establishing a centralized information source for wildlife in British Columbia had fermented in the mind of Wayne Campbell. Each month he laboriously added new reference information to his personal collection that included journals, books, copies of published and unpublished articles and reports, theses, and contributed field notes and observations. In some cases (*e.g.*, specimen records in museum collections) it took over a year to receive the material. Towards the completion of Volume 3 in *The Birds of British Columbia* series (see Campbell et al. 1990a, 1990b, 1997, 2001) it became apparent that the project



Figure 1. At a time when conservation issues are growing at an alarming rate, but funding and time prevent addressing all potential concerns, it is imperative to “step back” and consider the natural and life history of species in British Columbia. The Biodiversity Centre for Wildlife Studies has a unique opportunity to evaluate over 120 years of wildlife information, thanks in part to the dedicated efforts of Wayne and Eileen Campbell who worked diligently to organize and compile the largest centralized repository in British Columbia. For some species, like the Common Nighthawk, BCFWS databases are the largest for the species anywhere (see Table 4). Kamloops, BC. 25 July 2005 (R. Wayne Campbell).

would not be continued, or updated, by government because of the time and cost needed to complete the four volumes, and more demanding issues that needed their attention. In addition, many contributors felt that wildlife would benefit more by avoiding bureaucracy and accountability through the creation of an independent and external database that would be managed at arms-length from government. The benefit to government of course would be that decisions could be made with solid information, but with time, cost, and accountability being much lower than if they had to run it themselves.

Throughout much of the 1990s, the concept of an independent database was discussed at length with government managers, provincial and federal biologists, wildlife consultants, university professors, bird watchers, banders, environmentalists, and naturalists. These discussions led to recommendations of finding a suitable registered non-profit organization that would take on the challenge of maintaining a centralized wildlife database for British Columbia (Figure 2). The obvious choice was the British Columbia Field Ornithologists whose purpose was the study and enjoyment of wild birds in British Columbia. Unfortunately, the non-profit group was not established to develop or manage extensive databases and could not envision a commitment



Figure 2. Finding a registered, non-profit organization, with deep roots in natural history and conservation, to establish and manage a centralized wildlife information source for British Columbia was challenging. Kootenay Inlet, BC. 24 May 1996 (R. Wayne Campbell).

to take on the enormous task in the future. Other suggestions included the Federation of British Columbia Naturalists, British Columbia Waterfowl Society, Ducks Unlimited Canada, Northwest Wildlife Preservation Society, Pacific Northwest Bird and Mammal Society, Vancouver Natural History Society, Victoria Natural History Society, Sierra Club of British Columbia, and Nature Trust of British Columbia. The mandates of all groups did not include data collection and management. In the late 1990s a new and developing organization, WBT Wild Bird Trust of British Columbia, showed a keen interest in the comprehensive approach to wildlife conservation in the province (see below).

It was one thing to have access to an enormous personal collection (*e.g.*, Wayne's; Figure 3) and quite another to have it available in electronic form for conservation initiatives. The idea for establishing a unique central repository for all wildlife information in British Columbia was thus fully developed and expanded on by Wayne Campbell and Michael I. Preston in 1998, even though the history of data archiving had begun long before when Wayne and Eileen Campbell, and their friends, began transcribing bird notes (mostly from Audubon Field Notes, diaries of active naturalists [*e.g.*, Martin W. Holdom], published and unpublished literature,



Figure 3. In the early 1960s, Wayne Campbell started collecting, and saving, reference material on wildlife in British Columbia and 45 years later his collection occupies over 1,200 linear feet of shelf space. This portion contains original field notes of many collectors, biologists, and naturalists. Victoria, BC. March 2003 (R. Wayne Campbell).

bird bandings, annual bird reports (see Campbell et al. 1972a, 1972b, 1974), and bird watcher and sportsman observations) to systematic files in 1965. By 1972 they had compiled over 200,000 individual bird records to species sheets and observation cards on their own time. Wayne had also already established a personal library with an estimated 3,500 pieces of literature from scientific journals, natural history magazines, miscellaneous periodicals, technical reports, theses, books, and donated field diaries.

The purpose of amassing the bird records into a single centralized file was a personal project of Wayne's, to be used to update the publication *A Review of the Bird Fauna of British Columbia* by James A. Munro and Ian McTaggart-Cowan issued in 1947 (Figure 4). It was well known what Wayne's intentions were, and in November 1972, Dr. Ian McTaggart-Cowan and his late wife Joyce, invited Wayne and Eileen to dinner at their house in Point Grey at which time Dr. Cowan mentioned that he was thinking about updating his 25-year old book. Dr. Cowan was aware that Wayne was a good choice to become involved because of his incredible energy, organizational skills, and publishing record. During the preceding nine years Wayne authored 103 articles which provided species summaries and noteworthy observations important for updating the book (see Campbell et al. 1979, 1988). In addition, as Chairman of the Ornithology Section of the Vancouver Natural History Society, Wayne organized the first "Birder's Nights" and "Bird of the Year" award to encourage communication and share information among birdwatchers and biologists, and spearheaded the Society's first three consecutive annual bird reports. Also, in an attempt to discourage museums from collecting animals to substantiate rare occurrences, he and friend David Stirling established a provincial photo-records file in 1970 to document unusual occurrences or behaviours of amphibians, reptiles, birds, and mammals in the province (see Campbell and Stirling 1971).

Countless thousands of hours, mainly at university and government libraries in the late evening, were spent photocopying and transcribing these materials for preservation purposes. Through much of Wayne and Eileen's professional lives, he as Curator of Vertebrates in the Royal British Columbia Museum

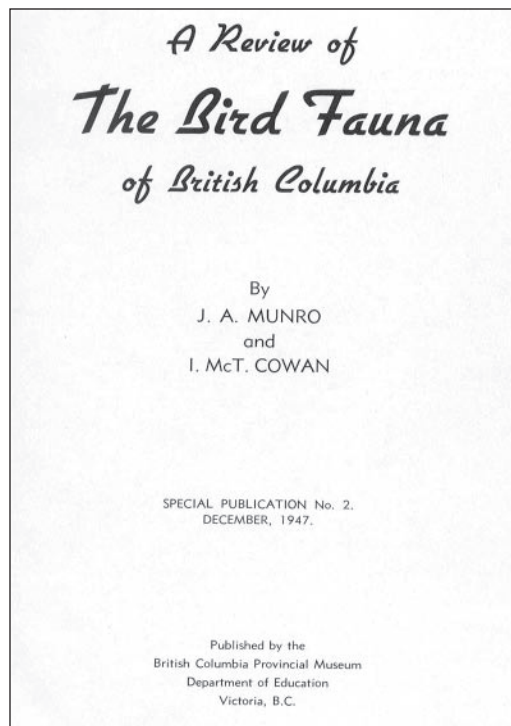


Figure 4. In the early 1960s, Wayne Campbell purchased a copy of *A Review of the Bird Fauna of British Columbia* by J. A. Munro and I. McT. Cowan for \$2.00 at the University of British Columbia bookstore. Shortly afterwards, Wayne started collecting information to update the 15 year-old book.

(e.g., BC Provincial Museum), and later a Senior Wildlife Scientist for British Columbia Ministry of Environment, and she as a teacher and full-time housewife raising two children, continued to amass material for their personal library. It was a passion, and during that period they personally financed the British Columbia Nest Record Scheme, additions to their growing library including journals, books, and articles, the Photo-Records File, and most travel expenses to provide lectures, workshops, and fund-raising events around the province.

By 1995, and nearing the end of Wayne's career as a civil servant, there was growing interest in what Wayne and Eileen could potentially do for

wildlife conservation in British Columbia, given that they had amassed an overwhelming collection of material pertaining to wildlife in the province (note: this collection is separate from that obtained during Wayne's career with government, and it was acknowledged in writing at the time of Wayne's employment that his personal collections would remain his property). He did, however, allow material from his personal holdings to be incorporated into the four-volume set *The Birds of British Columbia* – see Campbell et al. 1990a, 1990b, 1997, 2001) for one-time use (Figure 5). Needless-to-say, Wayne's earlier efforts jump-started the research and publication process. Later, personal costs and the amount of time and energy required to keep the collections active and current was on the rise, and so in an effort to maintain momentum, Eileen formed Westcam Consulting Services (hereafter Westcam) in 1992 as a means for generating revenue, all the while intending that the vision of a centralized provincial Wildlife Data Centre would one day become the responsibility of a self-governing, dedicated, non-profit society.

Also, about this time, there was a growing concern that decisions were being made about the management of provincial wildlife resources without supporting data. From 1998 through 2002 annual funding was received to put in a concentrated effort to collect, centralize, and computerize wildlife information for the province, and to put in place the necessary infrastructure for a Wildlife Data Centre to function (e.g., computers, desks, cabinets, etc.) that was at arm's length from government. The first four years of funding were meant to bring a large majority of the historical data together (i.e., create the centralized repository), while in the fifth year, a website would be designed and launched so that making information available to the greater public could be achieved. The task was overwhelming and to this end Wayne and Eileen had to renovate their basement (at a personal cost of \$20,000) to accommodate their library (that takes up four rooms), and working space for data compilation and entry that continued for six years. This was only the beginning of our challenges.

As we have now acknowledged that as of 1997 the databases would begin to be compiled, it is important to clarify how our wildlife databases came



Figure 5. Most of the information, for many species like the Wood Duck, published in *The Birds of British Columbia*, originated from the personal library of Wayne Campbell. Burnaby Lake, BC. 11 May 2004 (R. Wayne Campbell).

to be, and it is equally important to inform the public that there are in fact two major bird databases in British Columbia. The first database was compiled on hundreds of thousands of individual 3 x 5 inch file cards (Campbell et al. 1997), by the various authors (and certain government staff, part-time staff, and volunteers) involved in the production of *The Birds of British Columbia*. The original collection of cards had been amassed by Wayne and Eileen Campbell in the late 1960s and early 1970s and formed the foundation for the collection (Figure 6). Wayne and Eileen subsequently paid for most of the printing of the index cards.

The first two volumes of *The Birds of British Columbia* (e.g., the non-passerines - loons through woodpeckers) were written from these index cards

and thus an electronic version was not created for the production of the books. To our knowledge, neither the provincial or federal governments have yet created an electronic file of the non-passerines, although they do have most of the original cards from which those species accounts were written. A portion of that information still remains the personal property of some contributors.

Information on the passerines (flycatchers through Old World sparrows), from index cards and nest cards, was entered electronically through a federal government grant that was overseen by Neil Dawe at Qualicum Beach. D-Base programs were created by Neil, and for a short while, MS Excel was used to store some of the data. Data entry for the final two volumes of *The Birds of British Columbia* (passerines) was completed many months prior to the publication of volume 3 in 1997 (see page 9 in

Campbell et al. 1997). Upon completion of *The Birds of British Columbia* (volume 4), and subsequent to Wayne's retirement from the British Columbia Ministry of Environment, all of the D-Base and MS Excel files were returned to Neil Dawe of the Canadian Wildlife Service on 13 February 2001 by Wayne Campbell. All of the authors, except Wayne Campbell who was responsible for updating and reviewing each account for accuracy and current contents in the final volume, retained electronic working copies (e.g., disks) for the species they were working on. For example, John M. Cooper was preparing first drafts for the boreal warblers, Ian McTaggart-Cowan for his accounts (e.g., flycatchers, etc.), and Andrew C. Stewart for his accounts (e.g., Evening Grosbeak, House Sparrow, etc.).

Even though some of the information contained in the hard copy and electronic files may have been

SPECIES			MAP GRID			MONTH	DAY	YEAR
OBSERVER(S)								
ADULTS		IMM			TOTAL	EXACT LOCATION AND COMMENTS (BEHAVIOUR, FOODS, PLUMAGE, TIME, ETC.)		
M	F	?	M	F				
GRAND TOTAL								

Figure 6. Example of an original 3 x 5 inch record card used to transfer information from a wide variety of sources (e.g., literature, museum collections, diaries, sight observations, etc.) into species files for reference in preparing each account for the four-volume set *The Birds Of British Columbia*. The cards were designed by Wayne Campbell in the late 1960s for easy use and contained basic information necessary for later analysis. The original printings, about 250,000 cards, were paid for by Wayne and Eileen and provided the foundation on which *The Birds of British Columbia* “paper”databases were initiated.

distributed to other government agencies outside of the Canadian Wildlife Service who initially received a federal grant to enter the data for the passerine component of *The Birds of British Columbia* project. The BCFWS does not have a copy of these data although Wayne was the major source and support for the collection.

In the meantime, due to space issues and reverting back to collecting animals for their collections, the Royal British Columbia Museum paid to have hard copies of the 3 x 5 inch observation cards, and nest record cards that were on loan, stored for a few years in a commercial store, open to the public, in Victoria. This was a great concern to many contributors of the data.

The second major database, and the one that is of primary discussion in this report, was a database that had its beginnings shortly after the database for *The Birds of British Columbia* was completed (ca. early 1997). This new database was started from scratch, as it was realized from experience with the previous database that considerable information pertinent to each record was being lost due to limitations in computer space (note: original D-Base data was saved on 5 ¼ inch floppy disks and computer memory was relatively small and comparatively expensive; consequently extensive details about specific records were excluded from the database). Furthermore many of the secondary comments (*i.e.*, behaviour, habitat, mortality, phase, foods, etc.) associated with individual occurrence records were entered into a single database cell, thus making the retrieval of that information (*e.g.*, mortality factors) difficult to extract. By early 1998 computer hard drives were significantly larger than just two years previous, and processors were faster and capable of handling greater amounts of information. Additionally, Microsoft® had developed a new database (Access 97®) that was more user friendly and easier to program than databases previously, or currently, available from other manufacturers. Data entry fields now were no longer limited to a single row, but instead to the entire computer screen, thus providing more options for data entry and completeness (Figure 7).

Initially, Westcam employed part-time staff to work out of Wayne and Eileen's basement (1992-2001; Figure 8) and paid them with money that



Figure 7. To enhance the biological value of a wildlife record in the Biodiversity Centre for Wildlife Studies databases Michael Preston developed data entry screens that included individual components, for quick retrieval and analysis, for such things as colour morphs for this Red-tailed Hawk. Creston, BC. 14 February 2006 (Linda M. Van Damme).

remained from various contracts each year (*i.e.*, potential profit for Westcam). The staff largely had to be self-motivated as Wayne worked at home full-time during the final stages of his career with government editing the last volume of *The Birds of British Columbia*. This was necessary because of the efficiency of having his large personal library immediately available for reference. During this short period Wayne and Eileen paid all expenses (*e.g.*, telephone, postage, facsimiles, stationary, travel, photo processing, post office box rental, office equipment, and basement renovations for staff work stations).

It was Westcam's policy to employ university students and to provide above-minimum wage, flexible hours, fieldwork, and some mentoring. Eight students were working on, or had completed, their under-graduate degrees while working to build the databases and library. Four of those people went on to graduate studies, of which three have now successfully defended their theses (see DuBois 2005, Preston 2006c, Robinson 2007). In addition, Westcam also made small regular donations to the Williams Lake Field Naturalists towards the operation of the



Figure 8. While completing her B.Sc. degree at the University of Victoria Joanna Preston spent six years working for Westcam Consulting Services entering data into electronic databases. Victoria, BC. 11 September 2002 (Michael I. Preston).

Scout Island Nature Centre and to the Mackenzie Nature Observatory for their banding station.

At this time Wayne was working out of his home and Westcam actually paid to have a full-time staff member assist with the final stages of volume 4 of *The Birds of British Columbia*. Some provincial government funding later alleviated this. Data for the new database was initially input into an MS Excel® template, but while Michael Preston, also employed by Westcam, was entering data in late 1998, it became evident that significant improvements needed to be made with regard to quality control and efficiency. Subsequently, Michael began overseeing coordination of the databases in 1999 while working simultaneously to complete his undergraduate degree. During the summer of 2000 Michael worked for Westcam doing field research on Vancouver Island, but during much of his spare time he developed a set of original databases in Access 97® to make handling and processing of wildlife records more efficient, while also maintaining a high standard of quality control (Figure 9). In January 2001, Michael moved to Victoria to work full-time for Westcam, acting both as an interim Manager for what was intended to become the Wildlife Data Centre (“the Centre”), and as a consultant for various Westcam projects that would ultimately fund the Centre in a substantial, yet indirect, way. To date, Westcam has never made a profit from its operations but instead



Figure 9. While working out of a pick-up truck on rainy days and evenings during summer fieldwork on Vancouver Island, Michael Preston developed the present databases on which the Biodiversity Centre for Wildlife Studies information is stored. Near Memekay River on east-central Vancouver Island, BC. 23 June 2004 (Joanna Preston).

have channeled all surplus resources (see details below) to help make the vision for a Wildlife Data Centre become a reality. Eileen has never been paid wages and only in 2001 and 2002 did Wayne receive a small salary (\$21,600).

From 1997 through 2007, the cumulative monetary value of the investment provided by Westcam totals about \$1.2 million.

Becoming a Wildlife Data Centre

The Wildlife Data Centre began to take shape in early 2001 when Westcam rented a building in the Broadmead area of Victoria (Figure 10). At the

time the Centre was still not an official entity (*i.e.*, registered society) until, with the help of WBT Wild Bird Trust of British Columbia, and a wildlife covenant between Joanne Outerbridge (the property owner), Wayne (a Director of WBT) and Eileen signed a data transfer agreement on 17 July 2002 (Banning-Lover 2002). The data transfer was a long-intended gift from Westcam, and the signing would see all of the cumulative effort to date by Wayne and Eileen transferred to WBT, with the rental of the building also being taken over and subsequently purchased from Joanne using personal loans of \$50,000 from WBT Directors Adrian Joseph and Wayne Campbell, and lesser amounts from other Directors, as a down payment. At its maximum capacity, the Wildlife Data Centre had seven volunteer or part-time staff, with an average of more than 57,000 wildlife records being added to the databases each month (see Table 1 and 2). Unfortunately, within less than two years of moving into the Centre, WBT signed everything



Figure 10. With personal loans from several WBT Wild Bird Trust of British Columbia Directors, and Westcam Consulting Services providing initial rent, the Wildlife Data Centre, a provincial repository for wildlife information, was finally in place. Victoria, BC. 9 July 2000. (R. Wayne Campbell).

Table 1. Ten samples of data sources, with particulars, for wildlife records added to the Wildlife Data Centre digital databases, 1998-2007.

Source	Period	Years	Location	Records
<i>Muskrat Express</i> ¹	1980-2007	27	Cariboo-Chilcotin	130,345
Patrick W. Martin ²	1975-1978	4	Chatham Sound	36,458
John F. and Theodora C. Stanwell-Fletcher ³	1939-1941	3	Driftwood Valley	34,658
Penny Haering ⁴	1996-2004	7	North Nazko	16,512
John Comer ⁴	1977-1979	3	Duncan and Cowichan	13,747
Ron Mayo ⁴	1957-1992	39	Prince George & Atnarko	11,187
Jack Bowling ⁵	1990-1998	9	North-central BC	9,927
Glenn R. Ryder ⁴	1944-1945	2	Kelowna	8,656
Werner and Hilde Hesse ⁴	1958-1961	4	Burnaby	8,126
Derek Beacham ⁴	1970	1	Salmon Arm	3,123
Total Records				272,739

¹Newsletter of the Williams Lake Field Naturalists issued 10 times each year including detailed reports of Winifred Bennie, Linda Durrell, Phil Ranson, Anna Roberts, Jim Sims, and Jean Waite (Figure 11).

²Martin, P.W. 1980. Marine-oriented Birds and Mammals of Chatham Sound, British Columbia – winter 1977-1978. Canadian Wildlife Service Unpublished Report, Delta. BC. 41 pp. (Includes field diaries).

³Stanwell-Fletcher, John F. and Theodora C. Stanwell-Fletcher. 1943. Some Accounts of the Flora and Fauna of the Driftwood Valley Region of North Central British Columbia. British Columbia Provincial Museum Occasional Paper Number 4, Victoria, BC. 97 pp. (Includes field diaries and unpublished checklist).

⁴Personal field notes and diaries.

⁵Quarterly reports submitted by Jack Bowling, sub-regional editor for BC/Yukon and later North-central British Columbia, for publication in *Audubon Field Notes/American Birds*.

Table 2. Ten samples of total occurrence records for five species of nonpasserines and passerines in the Biodiversity Centre for Wildlife Studies electronic databases resulting from historical and current information transferred from hardcopy to electronic files from 1997 to 2007. Also see Table 4 for additional totals for intensive efforts required to prepare specific species updates for publication in *Wildlife Afield*.

Nonpasserine Species	Total Records	Passerine Species	Total Records
Ring-necked Duck	23,033	Eastern Kingbird	31,688
Horned Grebe	41,668	Common Raven	57,039
Great Horned Owl	62,322	Barn Swallow	154,217
Rufous Hummingbird	31,341	Swainson's Thrush	27,643
Lewis's Woodpecker	23,134	Yellow Warbler	37,394



Figure 11. For 13 years Jean Waite compiled, and published, noteworthy wildlife records from the Cariboo-Chilcotin region in *Muskrat Express*, a newsletter published 10 times a year by the Williams Lake Field Naturalists. This public domain publication, started in 1980, has been a major source of historical information for birds in an important region of the province. Williams Lake, BC. August 1990 (R. Wayne Campbell).



Figure 12. The present challenge facing the Board of Directors of the Biodiversity Centre for Wildlife Studies is securing a safe, accessible working space to house the largest collection of wildlife information in British Columbia that presently is in storage. Victoria, BC. 6 March 2008 (Michael I. Preston).

back to Wayne and Eileen when two Director's responsible for development and fundraising of the Centre were unable to submit their nominations for re-election due to family illnesses (Banning-Lover 2004). WBT subsequently sold the building, and returned the data, library, and office equipment originally gifted by Wayne and Eileen. At the time of writing this report, much of that information and equipment is still in storage boxes (Figure 12), inaccessible for many of the intended functions of a Wildlife Data Centre.

In the short time that the West Saanich building

was occupied, support for the Centre's initiatives grew considerably, and literally dozens of people visited (Figure 13), excited to proclaim support and ideas for future endeavours. But what was not anticipated was the rapid and sudden demand for data and information, long before there was a chance to seriously evaluate the kinds of data we had actually amassed. In a three year period prior to moving into the West Saanich property (1997 – 1999), the number of requests for information ranged from 1,126 to nearly 2,600 (Campbell et al. 1998, 1999, 2000) (note: after 1999 we did not keep good tabs on numbers



Figure 13. Michael Preston showing Vi and John Lambie the conservation potential of the electronic databases at the Wildlife Data Centre at the Broadmead facility in Victoria, BC. (R. Wayne Campbell).

of requests as other priorities took precedence; in retrospect we wish we had). Handling these requests was clearly a job too big for one person, and it was a job that was becoming increasingly demanding, as requests became more specific, time-consuming, and costly to fulfill. Again, Westcam was paying for this time, but as alluded to earlier, all of this was put on hold when, on 31 January 2004, everything related to the Centre that originally belonged to Wayne and Eileen, including the entire library and all of the infrastructure (Table 3) was boxed, disassembled, and moved either to Wayne's home, Michael's home, or to a storage locker. It was a terrible setback, but this was an opportunity to revisit our roots and to build on what we had learned. It was now time to do things right.

Table 3. From 1998 to 2003, Westcam Consulting Services purchased essential infrastructure that would form the basis for what would become the Wildlife Data Centre.

Office Equipment		Computer Equipment	
Qty	Description	Qty	Description
4	4 drawer filing cabinets	5/4	Computers/desks
1	2 drawer filing cabinet	3	rolling chairs
2	large storage cabinets	5	static mats
1	map cabinet	5	monitors
3	folding tables	6	towers
2	blue office chairs	4	printers
1	display table	5	keyboards
2	nest record cabinets	2	mice
2	waste baskets	3	sets of speakers
1	clock	2	laptops with cases
2	lamps	Other	extension cords, surge protectors, cables, etc.
1	telephone	Other Equipment	
1	photocopier	Qty	Description
1	fax machine	2	35 mm slide projectors
Other	pamphlet holders and sorting trays	6	framed pictures

A New Beginning

From January through April 2004, we set out to answer the question: “*What do people really want from a Wildlife Data Centre?*”. We consulted with dozens of individuals, including government and industry personnel, all of which culminated to provide a diverse cross-section of opinions. From these consultations, four clearly defined goals were identified:

- 1) continue centralizing wildlife information for British Columbia, complete with detailed wildlife records, the British Columbia Nest Record Scheme (Figure 14), a reference library, and the BC Photo File;
- 2) produce articles, stories, and information summaries that either update or provide new information on the status and natural history of wildlife in British Columbia, but also include news and progress of the Wildlife Data Centre, stories of people involved with wildlife, and news relevant to wildlife conservation in British Columbia;
- 3) obtain an internet presence by creating a website and making summary information available (e.g., society objectives, species maps, summary articles), and;
- 4) make information and data available to a diverse array of stakeholders by developing information and data-sharing policies for contributors and users.

Having reviewed these goals, we were confident that they could be satisfied, and so on 31 August 2004, we co-founded the Biodiversity Centre for Wildlife Studies (BCFWS) with eight other volunteer Directors (Dr. Fred L. Bunnell, Eileen C. Campbell, Dr. Brian W. Goodacre, Jude Grass, Dr. Alton S. Harestad, Dr. Richard A. Ring, Chris Siddle, and Ben van Drimmelen). The Centre was formed as a non-profit society under the British Columbia Societies Act (#S-48037) and was registered as a federal charitable organization (#84950-8478-RR0001). Work on the new society began immediately.

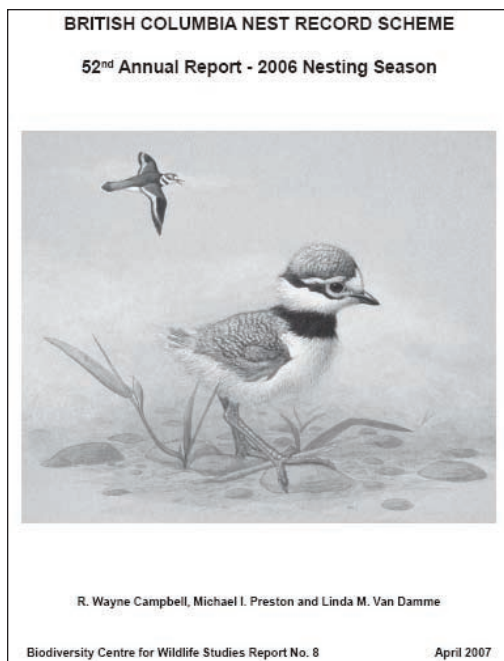


Figure 14. The British Columbia Nest Record Scheme, that includes detailed information on the nests, eggs, and young of birds breeding in British Columbia, has been managed and primarily financed by Wayne and Eileen Campbell for the past 37 years.

Fulfilling the aforementioned goals was a more challenging (some are ongoing), and more rewarding, task than we could have imagined. At the beginning, the first goal was not so difficult, as it was quite simply a continuation of what we had been doing previously. In fact, from July 2004 to June 2007, we added 1,278,713 wildlife records to our databases (Preston 2004a, 2004b, 2005a, 2005b, 2006a, 2006b, 2007b) which had now brought our electronic holdings to nearly 6-million wildlife records. We estimate that our current total holdings (electronic and hardcopy) include approximately 11-million wildlife records, with some dating back to 1887. It would seem we have some considerable work ahead of us. Where the challenges really began was when we started to tackle the remaining goals. Because much of the Centre’s operations now occurred in

our private homes, volunteer participation would be greatly limited until a new facility could be secured (see *Next Steps*).

To achieve our second goal, *Wildlife Afield* (Figure 15) has proven to be an exciting and promising endeavour. This bi-annual journal strikes a balance between publishing new information on the natural history of wildlife in British Columbia (e.g., *Feature Articles* and *Notes*), updating species profiles from *The Birds of British Columbia*, and producing comprehensive accounts of mammals, reptiles, and amphibians (*Featured Species*), providing updates on the Wildlife Data Centre (albeit the physical building does not yet exist), and summarizing relevant news and information about people, publications, and meetings (*BC Round-up*). Growth was apparent in the first four volumes, and substantial enough that we were able to produce the first supplement to *Wildlife Afield* in late 2006 (*Roads and Wildlife* Vol. 3, No. 1 Supplement). For

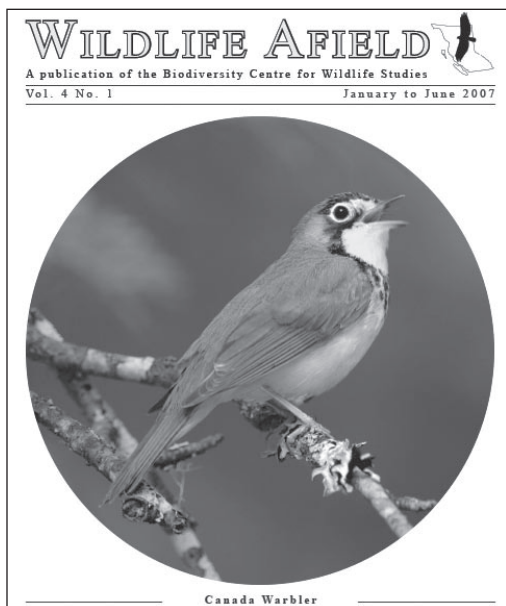


Figure 15. The first eight issues of *Wildlife Afield* contain 96 *Feature Articles* and *Notes* by 83 authors and 716 pages of text of which 75 articles are on birds, 14 on mammals, seven on reptiles, and six on amphibians.

the first time we were able to put the necessary effort and time into searching, compiling, and entering data for the *Featured Species* accounts (particularly birds) that allowed for a more comprehensive review that enable specific recommendations to address conservation and management concerns. The working databases for each *Featured Species* may take from four months to several years to develop, but the end product is impressive (Figure 16). Table 4 shows the increases in sizes of our current databases for six *Featured Species* and the nearly 550,000 records that were amassed to prepare and write the accounts. Incidentally, each species database is apparently the largest available for any province or state in North America.



Figure 16. The total number of breeding records for the Semipalmated Plover in the British Columbia Nest Record Scheme more than doubled since 1997 as historical information was extracted from literature and field diaries. Chilkat Pass, BC. August 1980 (R. Wayne Campbell).

Other publications that have helped fulfill our goals include annual *British Columbia Nest Record Scheme* reports (see Figure 14), a *British Columbia Birds 2005 Species List (Common and Scientific Names, Taxonomic Order, and 4-Letter Codes)*, three checklists in our *Wildlife Checklists of British Columbia* series (Tumbler Ridge, Chetwynd, and British Columbia), and a special report on songbird habitat in managed forests (Wind et al. 2005). The two previous issues of *Wildlife Afield* (Vol 3:2 and

Table 4. Differences in database sizes used to prepare six Featured Species accounts on birds. Comparisons are based on number of records used in *The Birds of British Columbia* species accounts, the number of records housed by the Wildlife Data Centre prior to launching *Wildlife Afield*, and number of records used to prepare the *Featured Species* accounts in *Wildlife Afield*. * in prep.

Species	Birds of BC ¹		Wildlife Data Centre ²		Featured Species ³	
	Occurrence	Breeding ⁴	Occurrence ⁵	Breeding	Occurrence	Breeding ⁶
Canada Warbler	127	5	329	11	9,087	34
Common Loon	11,438	368	93,904	723	*265,221	*1,679
Common Nighthawk	4,929	133	15,375	389	162,982	779
Semipalmated Plover	4,224	48	4,866	64	6,202	108
Heermann's Gull	2,351	n/a	3,847	n/a	34,711	n/a
Turkey Vulture	2,781	12	7,582	19	65,690	67
Total	25,850	566	125,903	1,206	543,893	2,667

¹ Total occurrence and breeding records referred to for publication of the species account in *The Birds of British Columbia*. Totals include untransferred records from reports, field diaries, bandings, and species summaries as well as hard copies of 3 x 5 inch record cards at the Royal British Columbia Museum and cards in the British Columbia Nest Records Scheme.

² Total occurrence and breeding records in the Wildlife Data Centre electronic databases, and the British Columbia Nest Record Scheme, housed by the Biodiversity Centre for Wildlife Studies prior to developing full databases starting in 1997 for updated accounts for the six species listed.

³ Total occurrence and breeding records compiled, and included in the Biodiversity Centre for Wildlife Studies databases, 1997-2007, used to prepare updated species accounts published as "*Feature Species*" in the journal *Wildlife Afield*.

⁴ Total nesting records actually filed in the British Columbia Nest Record Scheme. Not all breeding records referred to in *The Birds of British Columbia* were transferred to nest cards and many are on record cards at the Royal British Columbia Museum and in unpublished reports and diaries.

⁵ Includes all nest records, historical and current, completed and added to the British Columbia Nest Record Scheme since publication of *The Birds of British Columbia*.

⁶ Total breeding records currently deposited in the British Columbia Nest Record Scheme (Figure 16) housed by the Biodiversity Centre for Wildlife Studies, most historical cards compiled from 1997-2007.

4:1) are the largest to date (336 pages), and upcoming *Featured Species* for Common Loon and Black Tern will be substantial. Our publications will continue to be one of our strongest avenues for making information available.

After several developmental obstacles, we were able to fulfill our third goal by launching our website on 1 May 2005 at the 9th Annual *Wings Over the Rockies* festival in Invermere (Preston 2005c). Since inception, it has grown to include various information pieces, prototype species maps showing monthly occurrence and breeding distribution (Figure 17), news and information links, and downloads for submitting wildlife records for a variety of different projects. In the first year of operation, over 1,800 different users

(based on IP addresses) visited the website (Preston 2006). As of 31 December 2007, 5,219 different users have visited the website, and among our on-line reports have made 3,764 downloads. In the coming months and years our website will undergo considerable growth, especially in the areas of *Products and Services* and *Our Publications*. We are also planning a substantial amount of new material for the *Members Area*, including an on-line data entry screen for contributing wildlife records, and monthly wildlife species maps showing distribution and relative abundance by month. On 17 January 2008 we introduced through our website (www.wildlifebc.org) open-access to *Feature Articles* and *Notes* that are published in *Wildlife Afield*. *Featured*



Figure 17. Over the next few years the Biodiversity Centre for Wildlife Studies will begin posting on their website monthly distribution maps illustrating presence and breeding information for all bird species regularly occurring in British Columbia. Cadboro Bay, BC. 5 April 1997 (R. Wayne Campbell).

Species accounts area available on-line for a nominal fee, as are *British Columbia Nest Record Scheme Annual Reports*.

Our fourth and final goal has been the most challenging, and never have we dealt with so much controversy over a single issue than that of data

sharing. Awkwardly, we find ourselves at the crux of a contentious issue by manner of accident rather than purpose. On the one hand, we have been both honoured and delighted that so many contributors have believed in the vision for a Wildlife Data Centre (previously Wayne Campbell's vision), and whom have willingly and unselfishly donated insurmountable hours both in the field and in the office to contribute their wildlife observations to us. On the other hand, our wildlife databases have been catapulted to such extraordinary proportions (see Tables 1, 2 and 4) that they have been transformed into a virtual gold mine that is reminiscent of the Klondike Days. This caught us off-guard, because it put us in the middle of sorting out what appears to be two sliding scales in the understanding of how data and information should or should not be made available:

- 1) our contributors (*e.g.*, Figure 18) have a range of expectations about how we will, or will not, use data, and;



Figure 18. Birdwatchers are one of the numerous sources of information on wildlife in British Columbia and they have a vested interest in the conservation, management, and protection activities of governments, environmental organizations, and consulting biologists. Athalmer, BC. 9 May 1997 (R. Wayne Campbell).

- 2) our users have a range of expectations about how data should be made available and what limits (if any) should be placed on end use.

The remainder of this report focuses on our efforts to date to resolve the data-sharing issue and to facilitate the Biodiversity Centre for Wildlife Studies in becoming a self-sustaining organization. This report was initiated on 18 November 2006, when Michael announced at the BCFWS Annual General Meeting that data sharing was among its top priorities for resolution. While the report has been over a year in the making, much of the first half of this report was intended to get everyone on the same page so that we are all working with the same baseline information. Now it is time to move forward.

There are three essential components to the resolution of the data-sharing issue:

- 1) Wayne Campbell, Eileen Campbell, and Westcam needs to gift to BCFWS, a good portion of the data, library and equipment it has acquired, and BCFWS will act in accordance with the terms and conditions set out by the gift agreement. This was completed by way of a mutual gifting agreement that was “ceremoniously signed” on 8 December 2007 at the BCFWS Annual General Meeting (Figure 19), and officially signed on 28 April 2008.
- 2) BCFWS must develop a data-sharing policy that describes the uses and limitations of use of data by



Figure 19. Wayne and Eileen Campbell formally gifted their 46-year collection of wildlife information from British Columbia to the Biodiversity Centre for Wildlife Studies on 28 April 2008. In anticipation of the event, a ceremonial signing (above) was held during the BCFWS Annual General Meeting at Reifel Bird Sanctuary on Westham Island, BC. 8 December 2007 (Joanna Preston). Board of Directors, from left to right, include Michael Preston and Greg Jones (back row), Jude Grass, Gary Davidson, and Alton Harestad (middle row), and Ben van Drimmelen, Wayne Campbell, and Eileen Campbell (front row).

third parties, which will help ensure that BCFWS remains financially sustainable, but also protects individual contributors that do wish for some or all of their data to be given to third parties. The data-sharing policy is now complete, and follows this bulletin (see Pages 208-211).

- Contributors of data directly to BCFWS, and those individuals specified in the gift agreement, must provide consent to BCFWS for the use and distribution of their data to third parties (*i.e.*, users). Over the next six months past contributors will be asked to sign a *Data Use Agreement* (see Page 212) which provides flexibility for addressing contributor concerns. New contributors will also be asked to sign this form before their data is added to the system.

Next Steps

There is still much work to be done on behalf of BCFWS in order to make the Wildlife Data Centre viable, but in the meantime, we are now officially ready to process requests for information (Figure 20). Data and summary information will now be shared with potential users, except for that data and information that is pending individual contributor consent. Each request will be processed on a cost-recovery basis, and consideration for the amount of data or information required, end-use of that data or information, time to fulfill the request, and whether it is for consultants, governments, non-profit societies, or volunteer projects, will be factored into the final cost. A “*Data and Information Request Form*” is available for download via our website (www.wildlifebc.org). Completed forms should be e-mailed (datamanager@wildlifebc.org) or faxed (250-383-6145) to the Data Manager. Updates on the progress of having contributors sign *Data Use Agreements* will be summarized in subsequent *Reports of the Wildlife Data Centre* to be published in *Wildlife Afield*.

Another important step will be to find someone willing to act as a fundraiser for BCFWS. We expect the position of fundraiser to be challenging, but highly rewarding, as numerous new projects and publications are planned for the coming years.

These are exciting times.



Figure 20. Using a database of more than 250,000 Common Loon occurrence records, strong scientific evidence on changes in the winter distribution and probability of over-wintering in southern interior of British Columbia (1960 - 1999) was presented at an international symposium entitled “*Climate Change and Biodiversity in the Americas*” in Panama City, Panama on 28 February 2008. The change is largely attributed to warming winter temperatures which prevents ice from forming on lakes, as seen here at Stump Lake, BC. 25 March 2007 (Michael I. Preston).

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