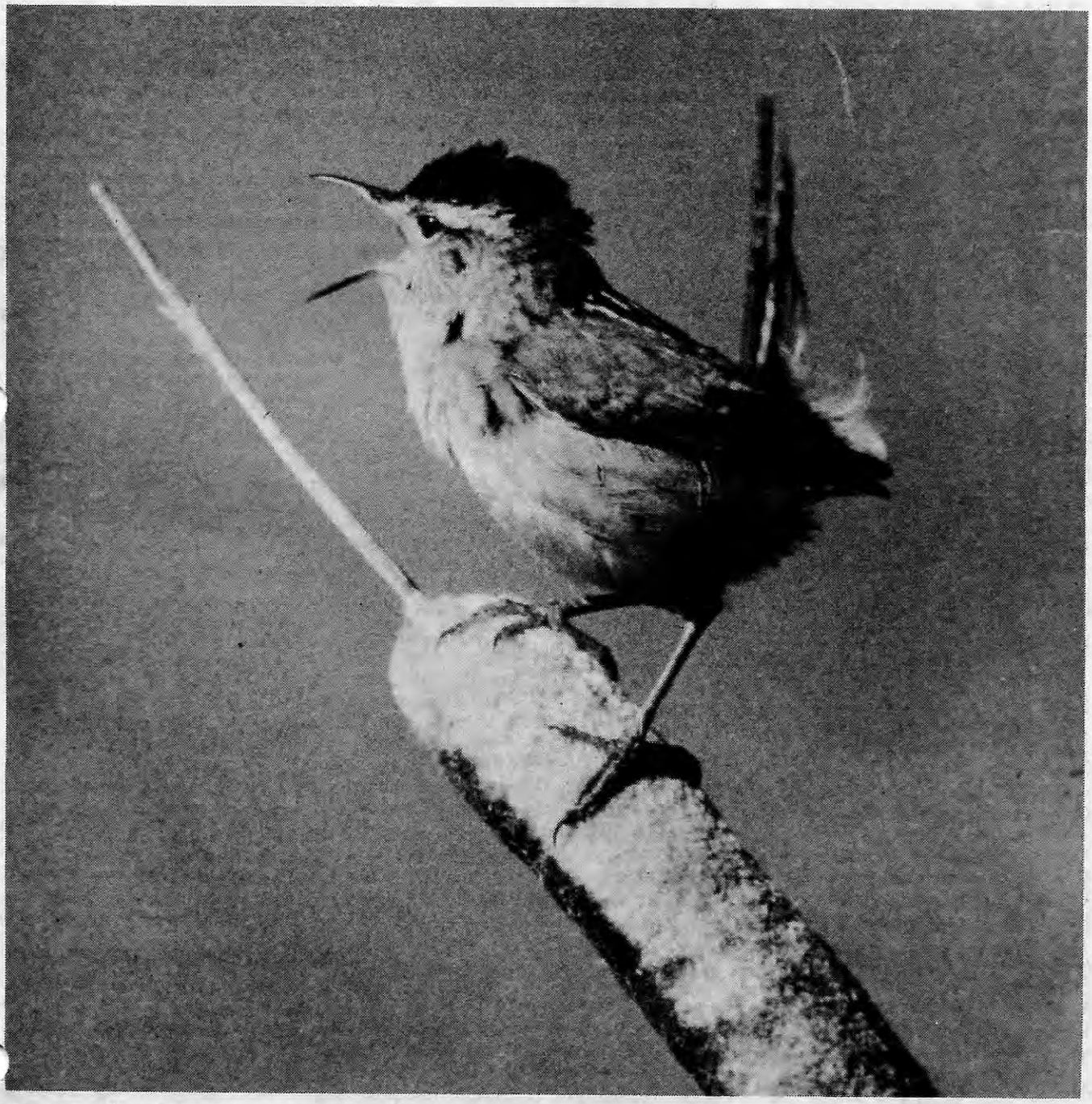
ISSN 0228-8842

B.C. Naturalist

SUMMER, MAY 1984 VOL. 22, NO. 2



The Federation of British Columbia Naturalists
1200 Hornby Street, Vancouver, B.C. V6Z 2E2

Marsh Wren
photo Tim Fitzharris

B.C. Naturalist is published quarterly by the Federation of British Columbia Naturalist 100 - 1200 Hornby Street, Vancouver, B.C. V6Z 2E2.

Second Class Mail
Registration No. 6247

DIRECTORY

EDITOR
Pamela Cowtan

ADVERTISING
Hugh Aikens

ADVISORY BOARD

Bert Brink	Norman Purssell
Al Grass	Frank Sanford
Jude Grass	Dick Stace-Smith

HONORARY PRESIDENT
Dr. Ian McTaggart Cowan

EXECUTIVE
President: Mrs. Jude Grass
437-7194, 202-6444 Silver Ave.,
Burnaby, V5H 2Y4

Vice President: K. Hall
224-7584, 3849 W. 23 Ave.,
Vancouver, V6A 1K8

Treasurer: Natalie Minunzie,
534-2116 23293 34A Ave.,
Langley V3A 7B9

Recording Secretary: Miss Marjorie Smith,
327-1938, 1146 East 60th Ave.,
Vancouver V5X 2A7

Membership/Office Secretary:
Adeline Nicol, 687-3333 Wedn.,
687-1600 Sat.; 1200 Hornby St.,
Vancouver, V6Z 2E2

Past President: Dick Stace-Smith
224-7024, 4274 W. 13th Ave.,
Vancouver, V6R 2B6

COMMITTEES
Conservation Chairman: Ken Hall,
224-7584, 3849 W. 23 Ave.,
Vancouver, V6A 1K8
Education Chairman: Al Grass
437-7194, 202—6444 Silver Ave.,
Burnaby V5H 2Y4

AFFILIATED CLUBS
AND DIRECTORS

VANCOUVER ISLAND
Regional Coordinator:
TBA

Arrowsmith Natural History Society: Box 1542,
Parksville V0R 1S0
D: Pauline Tranfield

Comox-Strathcona Naturalists:
Box 3222, Courtenay V9N 5N4
D: Jim Lunam

Cowichan Valley Naturalists:
Box 361, Duncan V9L 3X5
D: Peg Watson

Mitlenatch Field Naturalists:
Box 392, Campbell River V9W 4Z9
D: Ted Granger

Nanaimo Field Naturalists:
Box 125, Nanaimo V9R 5K6
D: Allan Hawryzki

Pender Island Field Naturalists:
c/o Ron McLardy, R.R.#1
Pender Island, V0N 2M0
D: Ron McLardy

Salt Spring Trail and Nature Club:
Box 998, Ganges V0S 1E0
D: D.J. Ready

Victoria Natural History Society:
Box 1747, Victoria V8W 2Y1
D: Winston Mair, MaryLou Florian, William Barkley

LOWER MAINLAND
Regional Coordinator:
Norm Purssell, 922-7992
2338 Ottawa Ave., West Vancouver
V7V 2S9

Alouette Field Naturalists:
c/o Margaret Shamlock,
22793 Reid Ave., Maple Ridge
V2X 4G7
D: Duanne van den Berg

Chilliwack Field Naturalists:
Box 23, Chilliwack V2P 6H7
D: Bircham Van Horne

Langley Field Naturalists:
c/o Irene Pearce, Box 3063,
Langley V3A 4R3
D: Anthea Farr

Royal City Field Naturalists:
c/o Mrs. D. Lehman,
1920 Tenth Ave., New Westminster
V3M 3J6
D: Vi Bennet

Sechelt Marsh Protective Society:
Box 543, Sechelt V0N 3A0
D: Vince Bracewell

Vancouver Natural History Society:
Box 3021, Vancouver V6B 3X5
D: V.C. Brink, Jude Grass, Ken Hall, Kay Beamish, Norm Purssell

White Rock and Surrey Naturalists:
Box 44, White Rock V4B 4Z7
D: Mary Louise Macdonald

THOMPSON-OKANAGAN
Regional Coordinator:
Peter Legg, 542-9031
Box 751, Vernon V1T 6M7

Central Okanagan Naturalists:
Box 396, Kelowna V1Y 7N8
D: Hugh Westheuser

Kamloops Naturalists:
Box 625, Kamloops V2J 5L7
D: Keith MacBell

North Okanagan Naturalists:
Box 473, Vernon V1T 6M4
D: Peter Legg, Peter McAllister

North Shuswap Naturalists:
General Delivery, Celista
V0E 1L0
D: Audrey Sugden

Oliver-Osoyoos Naturalists:
Box 1181, Osoyoos V0H 1V0
D:

Shuswap Naturalists:
Box 1076, Salmon Arm V0E 2T0
D: Mary McGilivray

South Okanagan Naturalists:
Box 375, Penticton V2A 6K6
D: Bev Grant

KOOTENAY

Boundary Naturalists Association:
Box 2194, Grand Forks V0H 1H0
D: Rosemary Santopinto

West Kootenay Naturalists Assoc.:
Box 3121, Castlegar V1N 3H4
D: Hazel Street

CARIBOO

Williams Lake Field Naturalists:
Box 4575, Williams Lake V2G 2V6
D: Frances Vyse

NORTH CENTRAL B.C.

Prince George Naturalists:
Box 1092, Stn. A, Prince George
V2L 4V2
D: Don Wilson

SKEENA

Prince Rupert Naturalists:
Box 515, Prince Rupert V8J 1P1
D:

PEACE

Timberline Trail and Nature Club:
Box 779, Dawson Creek V1G 4H8
D: Don Johnson

DIRECTORS REPRESENTING
INDIVIDUAL MEMBERS
Chris Siddle, 8927 116th Ave.,
Fort St. John V1J 2Y2

Deadline and distribution dates for the **B.C. Naturalist.**

Edition	Deadline	Distribution
Spring	January 15	March 1
Summer	March 15	May 1
Fall	July 15	Sept. 15
Winter	October 15	December 1

President's Message

One of the serious problems that we as naturalists have to face is the growth on our time demands by various government agencies to do volunteer work. It seems very easy to loose a sense of perspective. Clubs risk danger of extending themselves way beyond the limits of their original objectives for forming clubs. A good statement of these objectives is found in the F.B.C.N. constitution where the main purpose of the Society is stated in part: To provide naturalists and natural history clubs of British Columbia with a unified voice on conservation and environmental issues; To foster an awareness, appreciation, and understanding of our natural environment that it may be wisely used and maintained for future generations.

It is important to be realistic and recognize the fact that most people join the naturalist clubs for their own enjoyment and edification; not to become unpaid workers. This in no way denigrates one of the highest ideals of volunteerism which presumably is to help other human beings (and in some cases wildlife). In the not to distant past volunteerism was part of the fabric of society as witness the growth and development of service organizations.

Now that naturalists are being called upon to volunteer their services in a rather extensive way (and this should be taken as a rather great compliment!) it is perhaps time to stand back and review the entire situation.

Presently naturalists are being used in a variety of ways including Volunteer Warders in Ecological Reserves, docents and museum helpers, campground hosts, and naturalist guides. No doubt, demands will increase, since there are other proposed programs such as the Resource Patrol of the B.C. Ministry of Environment. Many naturalists contribute time freely, often out of a sense that they are doing something worthwhile for conservation and the community in which they live. Some people feel however that naturalists have been used to do the foot work to provide various government agencies, and even consulting firms, with free data and labour.

It should never be forgotten that consulting firms are in the business of making money by gathering data and writing reports for their clients. Should naturalists be the ones to provide this free data? Absolutely not! One solution to this problem has been suggested, that is, consulting firms (and even some government agencies) should contribute to certain habitat conservation projects or education programs (e.g. Nature Trust of B.C.) in lieu of fees for service. Remember that government agencies pay environmental consulting firms handsome fees for information.

Increasingly, naturalists are being asked to provide 'guiding' services in areas like provincial parks. Presumably amateur naturalists have a certain expertise on the provinces flora and fauna which can be offered to park visitors. Originally these naturalists were invited in a guests (that is, that they were there to suppliment or enrich the existing interpretive programs and were never to replace the professional or seasonal naturalist). Now, in some cases, volunteers have taken over the program completely, and they are to be praised for their considerable efforts.

There is a strong suspicion that one of the objectives of using volunteer naturalists is to obtain free labour. If professionals are to be replaced by volunteers why not carry it to the extreme and replace teachers with volunteers! Professional naturalists, now more commonly known as interpreters, are specialists, with not only a knowledge of the flora, fauna, history, etc., but more importantly with communication skills. They are often in the forefront of conservation education, attempting to get basic concepts of natural history and ecology to people who **do not belong to naturalist clubs.**

One way to approach these issues is to establish guidelines for volunteerism. Projects should be natural history related and should further the cause of conservation as expressed by the F.B.C.N. Human history projects should only be done where it is relevant to natural history; for example, pioneer uses of plants. These projects should be done along with organizations who specialize in human history. This policy in no ways ignores our responsibilities and concerns for our human heritage — it is simply that human history is not an area of our speciality or immediate concern. Projects should always be cooperative efforts with stated goals and benefits for all concerned. The chief objectives should never be to provide free labour for government agencies.

There are many areas where naturalists have made significant contributions through volunteer time. One notable example is the Ecological Reserves Wardens Program, where the high level of stewardship shown towards adopted Ecological Reserves has led to both heightened public awareness of the importance of reserves as well as protection of these sites. Another example is in the gathering of bird data for projects like the Vertebrate Zoology Atlas. This involves keeping of accurate records and completing and sending in sight observations cards and nest record cards. Many parts of British Columbia would be largely unknown from the avafauna point of view if not for these dedicated amateur naturalists.

It is not often recognized that some of our F.B.C.N. members serve on public advisory committees on your behalf for the federal, provincial and regional levels of governments. This is volunteerism of the best sense of the word since it promotes the conservation objective of the Federation.

It is especially true in these economic hard times to say that everyone is looking for ways of saving money — not the least of which are the various government agencies, at all levels. The agencies look towards community groups to provide them with the skilled volunteers that they **need!** They appeal to our sense of duty to our fellow human beings, and community, often making it hard to refuse. Clubs should think about their own objectives before over extending themselves with volunteer work. A close examination of most club membership structures shows that only a small percentage of the actual membership are interested in direct participation in committees and volunteer projects. Members who are forced or feel coerced into accepting projects for which they have no particular talent or incentive to complete will usually leave (drop membership). It is possible for a project to be so all-consuming that it destroys the club structure, sometimes leading to a schism.

Projects initiated and completed by club members, it should be recognized, are more important than those which involve being servants to outsiders.

Again, nothing should be taken away from the worthy efforts of volunteers, but I urge you to consider the needs of your membership first.

Jude Grass

Over the editor's desk

THE FUTURE OF MANNING PARK

Letter to The Honourable A. Brummet, Minister Lands, Parks and Housing.

A great deal has been written about Manning Park, but now that the commercial complex, including ski facilities, is to be sold to private enterprise it is essential that everyone be aware of the park's special features.

Manning Park is the crown jewel of B.C parks, a 71,400 hectare Class A park lying mid-way between Hope and Princeton and bisected by a major highway. It has everything: a beautiful and diverse landscape encompassing mountains to climb, stocked lakes with rental boats, good swimming, glorious alpine meadows, and facilities for both downhill and cross-country skiing. Little wonder that it is the most utilized park, on an annual basis, in the province.

In addition, Manning has a lodge-cottage-restaurant complex, bordering the highway, which was run by the Parks Branch until last September and which is now to be sold. Such a move was perhaps inevitable, and there is no reason why it cannot be successful. The Parks Branch should not be in the hotel business in competition with other commercial lodges. It is also difficult for the government to justify spending more money to upgrade facilities when that becomes necessary or to make further capital investment.

The new owners will acquire the buildings, the power plant and the ifrastructure, but the land itself remains park. Questions remain about possible further concessions, but these appear unlikely because the power plant is already operating at capacity during peak periods of the day. The power plant is a key factor in future planning as there are no hydro lines between Hope and Princeton and little likelihood they will be built in the forseeable future because of the prohibitive cost.

The important question is what is going to happen to the park itself. Officials are resolved that there will continue to be a substantial park staff to protect and maintain it and that firm guidelines will be written into the contract with the new owners of the lodge.

The park staff this winter has been minimal. Seven staff have remained to look after the buildings, generator, and other park facilities. This staff has also been responsible for enforcing park regulations and maintaining the winter camping area at Strawberry Flats. There will be no park staff in future winters.

When summer comes and thousands of visitors begin arriving, some just passing through but many staying at the campgrounds or in the lodge, will there be adequate staff? Or will the restraint program cut so many jobs that the park will suffer?

To ensure the park is protected while these visitors enjoy its many attractions, a number of important concerns should be addressed.

Protection and Maintenance

First, the campgrounds must be maintained. This involves looking after the individual sites, access roads, water supply, garbage collection and toilets. Maintenance of trails is another major task, especially in the spring. Here, too, garbage is a problem — the public is not noted for its clean habits.

Patrolling the campgrounds, picnic areas and "stops of interest" along the highway such as the famed stand of rhododendrons is another responsibility, as well as the need for back-country staff, search and rescue and first aid.

The alpine meadows, which can be reached by a fine mountain road and are one of the glories of Manning Park, are fragile and need constant supervision. Hikers must be kept on the paths, which in that environment require considerable maintenance.

Interpretation

Last, but certainly not least, there is the interpretation program, the feature of Manning Park that makes it such a rewarding place to visit. It is through the naturalists that visitors' eyes are opened to the beauty and rich variety of the park, to its plants and animals and diverse landscape. They organize valley and alpine walks, bird, beaver and star watches, evening talks, slide shows and campfires, as well as special entertainments. These activities attract large numbers of people and are often what is remembered best about the park.

The focal point of the interpretation program is the Nature House, which was the first in B.C. and initiated the province-wide interpretaion program. It has an excellent location, just off the highway at the entrance to the lodge parking lot. Even the casual visitor can drop in to see the displays, pick up literature and talk to the naturalist on duty. There is alwys someone to answer questions, give advice on trails or fishing, or just extend a welcome.

There are reports the Nature House may be sold or moved to another location. These are not good ideas. It has been in the same spot since 1961, and is known to everyone who has stopped in the park. It should continue to be the link between the lodge and the park program and can be nothing but an asset to the new owners. Without it, highway travellers might never regard Manning Park as anything more than a lunch stop.

It cannot be overstated how vital it is to have an adequate staff, in uniform and highly visible, in all our provincial parks. Manning deserves our special attention because it has been developed wisely, has a host of attractions, and is easily accessible to 70 per cent of the province's population. We must make every effort to keep it a model.

February, 1984
Margaret Whitelaw,
Victoria Natural History Society

THANK YOU

Very special thank you's are directed to three people without whom the **B.C. Naturalist** would not have been printed or delivered.

Jim Addie, our layout man, was responsible for getting the rough copy typeset and doing the paste-up. The paste-up generally took a full day, and Jim's wife Ivy helped with the last minute typing of titles and credit lines as well as providing great lunches on paste-up day. Jim asked to 'retire' from the position but we are hoping he will be a standby for us in the future. Thank you Jim.

Frank Sanford, helped with distribution. Before our second class mailing was authorized Frank was responsible for the bulk mailings to clubs and the individual membership list. Armed with stamps, string and paper and the seemingly endless roll of labels, Frank and his helpers folded, taped, stamped and trudged off to the post office four times a year. Frank will remain with the Advisory Committee to help with copy, proof reading and layout. Thank you Frank.

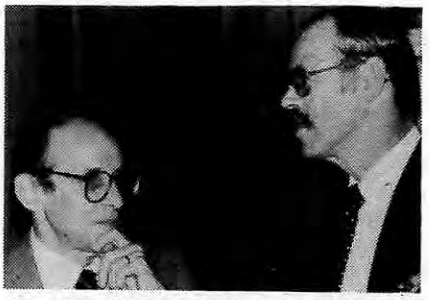
Dick Stace-Smith deserves a medal for determination and steadfastness beyond the call in getting the Second Class Mailing authorization from Canada Post. Dick started in June last year and final approval came early in March 1984, after numerous letters and phone calls to Ottawa and the local Post Office. Thank you Dick.

Symposium on Parks in British Columbia

Steve Kun, Director, Western Region, Parks Canada, helped to set the stage for the conference theme, "Parks Today and Tomorrow".

Rick Hankin, Greater Vancouver Regional District Parks Department Manager, gave an overview of the Regional Park system.

Rosemary Fox, Canadian Nature Federation Director, gave a paper and chaired a workshop on the Spatzizi Wilderness area and its management problems.



Dr. Joseph Sax (left), Law Professor, University of Michigan, Conference Keynote Speaker, whose address warned that an "enclave mentality inhibits parks growth". He is seen here in conversation with Dr. Peter Dooling (right) of the U.B.C. Faculty of Forestry and Chairman of the Parks in British Columbia Symposium Committee.

PROCEEDINGS AVAILABLE

The proceedings from the **Symposium of Parks in British Columbia** held in Vancouver in February 1984 will be available later in the year. Those who did not attend and would like a copy should send a cheque for $10.00 to Symposium on Parks, Outdoor Recreation Council, 1200 Hornby St., Vancouver, B.C. V6Z 2E2.

Jake Masselink, (second from right), B.C. Parks and Outdoor Recreation Division, chaired a presentation and workshop under the heading of 'How are we going to deliver?' which also included the question of privitization of services. (photo below)

Honourable A. J. Brummet, British Columbia Minister of Lands, Parks and Housing, and Minister of the Environment. The Ministers introductory remarks helped to put B.C.'s park system into perspective.

Dr. Peter J. Dooling
Symposium Organizing Committee
University of British Columbia
Vancouver, B.C.

Dear Dr. Dooling:

I would like to express my sincere appreciation to you and all those who assisted in the organization and production of a very successful and stimulating parks symposium. Please extend my thanks especially to the members of the Federation of B.C. Naturalists, the National and Provincial Parks Association of Canada, the University of British Columbia and the Outdoor Recreation Council of B.C. who assisted in this very successful event.

The number of registrations was far beyond what I had expected and included a wide cross-section of our society. You and your organizing team are to be congratulated for this.

It is my hope that through meaningful discussion and dialogue as you promoted at this symposium, we, in British Columbia will strive to grow in our tolerance, consideration and understanding of each other in advocating our individual or collective recommendations, proposals or concerns on the establishment and management of parks in this province. It is my hope that as a result of conferences like this one, constructive and productive relationships will continue to develop between the public-spirited individuals and organizations represented at your symposium and my Ministry.

In this respect I was pleased that my Ministry was able to assist you in making this event possible.

Congratulations on a job well done.

Yours sincerely,
Anthony J. Brummet
Minister

Photo Credits: Al Grass

Wildlife atlases Progress report

WINTER 1983-1984

Thank you for your comments on the second draft of the COMMON BARN-OWL species account. As a result of these, along with comments from biologists with the Fish and Wildlife Branch, Canadian Wildlife Service, Ministry of Forests, Provincial Museum and Vertebrate Atlas Committee, the final species draft and product guide has been prepared.

The species account has been shortened, reorganized and written in a more readable style. The sections on "Weights", "Legal Status", "Branding" and "Mortality" have been deleted while sections on "Reproduction" and "Foods and Feeding" have been shortened. Other sections have been merged, for example "History and Documentation" with "Population Size and Trends". The "Literature Cited" section will remain but references will be listed at the end of the book, not after each species account.

It appears that most critics want to retain circles (not triangles or squares) on the distribution map. A circle will now appear in a grid if there is a record and black will represent breeding, and grey an occurrence record. We will retain the "season" approach by dividing each circle into four parts.

Copies of the final species account are available by writing to me at the Provincial Museum. The atlas committee is aiming for April, 1985 as the completion date for the first volume of the bird atlas (Non-passerine — loons through woodpeckers). We still require volunteer help in transferring some records, expecially records of B.C. specimens from other North American museums. If you have time and can help with this tedious but important task over the next six months, please contact me at the museum. We can supply material to volunteers through our regional coordinators.

PUBLICATIONS OF INTEREST

Again, all articles preceded by an asterisk (*) have made reference to information sent to the museum by naturalists.

*Cooper, J.M. 1983. RECENT OC CURRENCES OF THE AMERICAN AVOCET IN BRITISH COLUMBIA. **Murrelet** 64(2):47-48.

*Emmett, Kathryn A. 1983. INFLUENCE OF FORESTRY PRACTICES ON BIRDS IN SOUTHWESTERN BRITISH COLUMBIA. Master of Natural Resource Management Thesis, Simon Fraser University, Burnaby. 112 pages.

*Gregory, P.T. and R.W. Campbell. 1984. THE REPTILES OF BRITISH COLUMBIA. **British Columbia Provincial Museum Handbook** No. 44, Victoria. 103 pages.

*Guiguet, C.J. 1983. THE BIRDS OF BRITISH COLUMBIA: SPARROWS AND FINCHES. **British Columbia Provincial Museum Handbook** No. 42, Victoria. 122 pages.

*Harcombe, A.P. 1983. WILDLIFE HABITAT HANDBOOKS FOR BRITISH COLUMBIA: PROBLEM ANALYSIS. **Province of British Columbia,** Victoria. 219 pages.

*Maurer, April L. and Alton S. Harestad. 1983. BIBLIOGRAPHY OF MOUNTAIN BEAVER: A FOREST PEST IN THE PACIFIC NORTHWEST. Student Report, **Simon Fraser University, Department of Biological Sciences,** Burnaby. 21 pages.

*Obee, B. 1983. BALD EAGLE. **Wildlife Review** 10(6):22-24.

*Pitman, R., M. Newcomer, J. Butler, J. Cotton and G. Friedrichsen. 1983. A CRESTED AUKLET FROM BAJA CALIFORNIA. **Western Birds** 14(1):47-48.

*Ritcey, R., D. Jury and D. Low. 1983. BURROWING OWL PROJECT (1983). Unpublished Report, British Columbia Ministry of Environment, Fish and Wildlife Branch, Kamloops. 8 pages.

NOTEWORTHY RECORDS

All records are from November and December, 1983 through January and February, 1984.

MAMMALS

Very little is known about bats in the province, especially during the winter season. So, the record of a SILVER-HAIRED BAT found inside a small woodpecker hole on Saltspring Island on January 21 by T. Griggs, is significant. There are only 4 other winter records, all from extreme southwestern British Columbia. The Saltspring Island bat was active, and was feeding, as insect remains (mostly beetles) were found at the bottom of the roost hole.

Ken Child and Ken Fujino, Fish and Wildlife Branch in Prince George, passed along an incredible LYNX story. In 1982 biologists in Washington State radio-collared a lynx about 10 miles south of Osoyoos. They last contacted the animal on April 20, 1983. Seven months later, on November 26, and nearly 400 miles away, the animal was found in a trap in Prince George! No doubt bridges and highways assisted in its northern trek.

Sightings of NORTHERN ELEPHANT SEALS are becoming an annual occurrence in the Straits of Juan de Fuca and Georgia. On 21 December a male was seen off Race Rocks by B. Williams, a local sports fisherman.

BIRDS

YELLOW-BILLED LOONS were reported throughout the winter months in southern coastal areas but a bird photographed on December 27, by Doug Innes and Paul Johnson at Venn Passage, is the first record for the Prince Rupert area. Large flocks of ARCTIC LOONS were counted in Madrona Bay, North Saanich (1340) on 21 January by Ron Lott, and Active Pass (1300) on the same date by Roy Prior. Ken Mugridge, electronics foreman on a seine boat recorded some anecdotal information on diving depths of WESTERN GREBES. On December 7, while passing through a large flock in Active Pass, 12 grebes ". . .dove down. On sonar most went to

42 ft. and came straight up again. One got to 66 feet before rising".

A family of TRUMPETER SWANS fitted with blue-lettered collars near Northway, Alaska on August 19, 1983 were located on Klaklakama Lake, near Woss on Vancouver Island by Myke Chutter on January 10. Thirteen TUNDRA SWANS, rare near 100 Mile House, were seen by I.L. Rockwell on November 19 and 20. Rick Bonar and John Woods recorded their heaviest ever fall migration of CANADA GEESE when 4771 were counted flying by Revelstoke on November 14. A single EMPEROR GOOSE, scarce on the Queen Charlottes, was reported near Sandspit by George Deagle on March 2. Two more noteworthy waterfowl include a male TUFTED DUCK at Maplewood Mud flats on January 1 by Mark Daly and the female KING EIDER was last reported from Vancouver on February 19.

For the first time both species of pelicans which occur in the province were recorded during the winter period. Three immature AMERICAN WHITE PELICANS were present at Creston in October and November while the last BROWN PELICAN off southern Vancouver Island was reported at Pedder Bay by Ralph Brown on December 20. TURKEY VULTURES may have wintered off southern Vancouver Island. Keith Taylor saw 2 near Constance Bank on December 11 and Wayne Campbell saw one soaring over the University of Victoria on February 19. A grey-phase GYRFALCON seen near Kamloops on January 28 (Ralph Ritcey) and February 5 (Rick Howie) was an exciting find for interior birders.

An interesting band return of a CALIFORNIA GULL was sent to me by Harry Carter. A bird was banded near James Lake, Wyoming on April 20, 1982 and found dead near Bamfield (B.C.) four months later on August 31, 1982. Two eastern records of CATTLE EGRETS are noteworthy. A single egret was seen on November 4 by Derek Peach, near Grand Forks and on the same date another was seen at Revelstoke by Rick Bonar. The next day, perhaps the same bird, but seen by Eric Dafoe, provided the first record for nearby Glacier Park. A BLACK-CROWNED NIGHT HERON photographed (BCPM Photo No. 882) at Reifel Refuge on February 4 is our second winter record.

ANNA'S HUMMINGBIRDS were reported from at least 12 different locations with new records from Terrace (1 male, November 29, Dave Crack) Tofino (1 male, December 18 and 19, Adrian Dorst). The Terrace bird was caught and sent to Vancouver by plane and eventually released at the Reifel Migratory Bird Sanctuary. A vagrant STELLER'S JAY photographed by Chris Siddle (BCPM Photo No. 877) in Fort St. John on November 12 probably wandered into the area from mountainous areas to the southeast. The 2 BLUE JAYS present in Delta most of the winter, and seen by many observers were present through late March. Two rare WESTERN BLUEBIRDS were seen in several locations on southern Vancouver Island by many birders from December 12 to January 29.

Adrian Dorst reported two noteworthy warbler records for Tofino, a TENNESSEE WARBLER on November 9 and a PALM WARBLER (BCPM No. 884) on December 24. A very late departing WESTERN TANAGER was photographed (BCPM No. 880) in Kamloops by Bill Huxley on December 9. SWAMP SPARROWS were reported from Long Beach (September 29, Adrian Dorst), River Jordan (November 25, Keith Taylor), the Victoria area (at least 9 individuals in 7 different locations during the winter), Pitt Meadows (December 6, Glen Thomson), and Reifel Refuge (January 4 through March 10, Hue MacKenzie, Dale Jensen et al.). BRAMBLINGS "invaded" the province this winter with records from Sooke (November 20, Keith Taylor), Queen Charlotte City (November 20 to January 7, Brian Eccels and Mary Morris), Ladner (January 22, Craig Runyan), Vancouver (January 23 through February 25, Jack Husted et al.), and another bird on February 12 (Michael Price), and Campbell River (February 8, Nancy Allen).

A SMITH'S LONGSPUR seen at Delkatla Slough (Charlottes) by Peter Hamel and Margo Hearn on November 18 is our first winter record. A RUSTIC BUNTING seen from November 25 to February 20 at River Jordan by many observers including Vic and Peggy Goodwill, and later photographed by Tim Zurowski (BCPM Photo No. 883) is the province's first documented occurrence.

REPTILES AND AMPHIBIANS

The mild, but wet winter on the coast meant that some frogs and salamanders were reported each month. PACIFIC TREEFROGS were first heard singing at Queen Charlotte City on February 14, and near Chemainus on Vancouver Island on February 19. A NORTHWESTERN SALAMANDER was discovered deep in a woodpile on Saltspring Island on March 5. The animals, although sluggish, was able to move and avoid capture. COMMON GARTER SNAKES were irregularly seen by H. Rushton near Port Renfrew in February and March.

R. WAYNE CAMPBELL
VERTEBRATE ZOOLOGY DIVISION
B.C. PROVINCIAL MUSEUM
VICTORIA, B.C. V8V 1X4

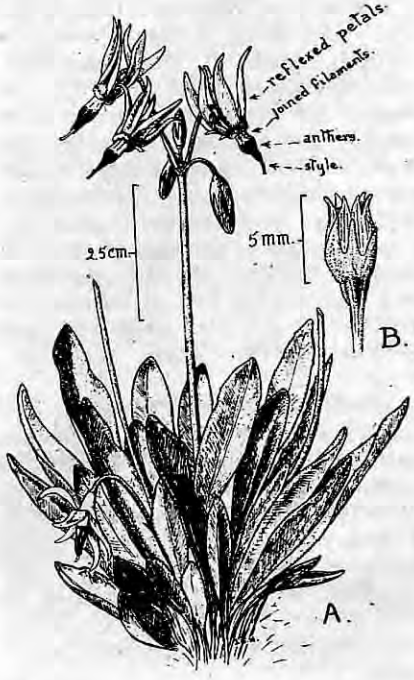
B.C. Wild Flowers

DICOTS— continued

Here in B.C. we are lucky to possess one of North America's favorite wild flowers, the Shooting Star, Peacock or Soldier Cap, genus *Dodecatheon*. There are some fifty or so species in western North America (W.F.W.) and several in the eastern central States, but the genus is found elsewhere only in East Asia (C., C., and D.). Alberta and Saskatchewan share our luck, but the rest of Canada has to do without this charming spring flower. According to the late Dr. T.M.C. Taylor's preliminary check list of 1966, there are seven species in B.C. of which *D. pulchellum* is reportedly endangered.

It is clear that taxonomists have been hard at work because *D. pulchellum* (Raf.) Merritt subspecies *pulchellum* = *D. pauciflorum* (Durand) Greene, and Lewis Clark has "deferred to the judgment of Calder and Taylor" in calling the form from the Dry Interior "*D. pulchellum* ssp. *cusickii* (Greene) Calder and Taylor." Then, in "H. and C.," we find the *species "D. cusickii = D. pauciflorum* var. or ssp. *cusickii"* which =, apparently, *D. puberulum* in Dr. Taylor's check list, and is also described in "Henry". I mention this merely to show that scientific names can be just as confusing as common ones after the "lumpers and splitters" have had their day!

Dodecatheon is a member of the Primula family, Primulaceae, and is often called the American Primrose or Cowslip. Its likeness to a small Cyclamen is not surprising since the Cyclamen belongs to this family, too. The name *Dodecatheon* (from the Greek dodeka, twelve, and theoi, gods) was given by Linneus who "imagined he saw in its umbels of bright crowned flowers a little congress of divinities and hence named it for an Olympic gathering of the gods." (J.W.H.). The specific name *pulchellum means "beautiful" and that is a better description than pauciflorum* which means "few flowered." This plant is indeed beautiful and wherever it finds sufficient moisture and good soil it often has several flowers in each umbel and two or more flower stalks to each plant. The plant shown in the drawing came from the richly flowered meadows near Chase. In all species the leaves are all basal and the flower stalks carry the flowers well above the leaves. In *D. pulchellum* the lanceolate leaves are erect, generally have entire margins, and rather indistinct venation. A few blunt teeth may occur along the margin of some. In Dry Interior specimens the leaves and flower stalks may be strongly puberulant, i.e., covered with minute hairs (hence *D. puberulum?).* The flowers arise in a bracted umbel, each with its own long pedicel. When fully open they measure 2-2.5 cm from the tips of the reflexed petals to the tip of the "beak". Both sepals and petals are flared back over the ovary and part of the pedicel as the flower opens. The petals are usually a bright rose-purple, occasionally pale, and very occasionally white, with deeper color next to their yellow base. Just where this yellow base turns back there is a wavy line of deep rose-purple or red. The short yellow filaments of the stamens and the long, dark-purple anthers are joined to form a tube from which protrudes the long style with its small stigma. The flowers are thus well named, "Shooting Stars", less well, "Peacocks", and only very oddly, "Soldier Caps", though the last was always our local name for them in my childhood. The flowers "have a fragrance as of hyacinths" (W.C.McC). As the flower fades, the pedicel slowly straightens so that the brown seed capsule is upright. These are five- to seven-valved and when ripe the valve tips curl back so that the many seeds can be shaken out by the wind.



Since elk and deer are said to eat the plants (C., C., and D.), cattle presumably eat them, too, which may be one reason why this plant occurs in such abundance in Chase Flower Meadows. These meadows are within a Reserve belonging to the Adams Lake Indian Band. The Indians do not put out their cattle until after the flowering season and these same meadows carry a wealth of spring flowers including Glacier Lilies, Yellow Bells, and Spring Beauty. Perhaps there were many more of such "flower meadows" before white men came with their cattle, and, more recently, their terrible introduced weeds. In Chase Flower Meadows the Shooting Stars are so abundant the meadows are turned deep pink in places during their flowering period in late April or early May, and I do not know of any other place in the Dry Interior where such abundance can be seen.

D. pulchellum alias *pauciflorum* is apparently our commonest species with the widest distribution. It is found from coastal flats and damp meadows up to altitudes of 2130m (7000 ft.) from Alaska to Mexico (L.C.) and east to Pennsylvania (H.&C.). It is sometimes found in meadows bordering salt marshes along the coast. It can be distinguished from *D. hendersonii,* the common species of the lowlands west of the Cascades, by its upright, narrow leaves and its yellow stamen filaments (deep red-purple in *hendersonii*), but any Shooting Star found near a salt marsh is likely to be *pulchellum* (E.N.K.). Here in the North Okanagan, it grows in fair abundance on the moister north-facing slopes of our dry grasslands, in open glades of Ponderosa pine and amongst shrubs of Syringa and Saskatoon. In drier open areas it is sparse to absent and the plants are small and few flowered. This severe dwarfing is very characteristic of many plants of the dry grasslands, plants which attain such vigorous growth in damper conditions as to be almost unrecognizable.

With such a wide range of habitats over so wide a geographic area, it is not surprising that *D. pulchellum* includes a variety of forms and therefore so many "alaises". Lewis Clark describes three species of *Dodecatheon* besides *pulchellum.* Of these, *dentatum,* with white flowers and dentate leaves, is "rare in our area". It has been found only in the South Okanagan at 4000 ft. and in the Cascades where it is clearly at the northern limit of its range (Washington to north Oregon and east to central Idaho—H.&C.). *Hendersonii (latifolia)* is the Broad-leaved Shooting Star with a range extending west of the Cascades to California where it is widespread. Its

cont'd on page 22

ptarmigan ptracks

DAVID with STIRLING

Birding Games

Bird listing has been condemned by some people as being "unscientific". (Actually listing can be "scientific" but the most important aspects are recreation and fun). Getting a big list requires talent, skill, experience, organizational ability, endurance, persistance, cooperation, and , I emphasize, a sense of humour. Being good at identification of birds helps too.

Birders are constantly inventing new ways to enjoy the listing game. Once there were only life lists, country lists, province lists and year lists. Some birders participated only in the Christmas Count. Now we have first bird at the airport, first bird after the last martini and the "big sit" (species seen while sitting in one spot).

Some of the more extreme listing capers require not only great endurance but also leaving home WITH your American Express card. In 1982, in Texas, a group which included Roger Tory Peterson tallied 235 species in a "big day" for a new North American record. This group logged 133 miles by car, only 2 miles on foot and 300 miles by plane. They also netted $25,000 for the National Audubon Society in Birdathon pledges. Not bad for twenty-four hours work. In British Columbia, two Cannings and Doug Kragh scored a provincial big day record of 162 species. But the world record goes to Peru where a group travelling only 19.5 km on foot and 9.5 km by canoe tallied the incredible total of 331 species between 3:30 a.m. and 8:30 p.m.

Most birders keep a year list. In 1979 I saw 320 species in British Columbia. I though this record would stand for a few years but in 1983 Mike Force recorded 336 species! Friendly competition is another aspect of birding.

Eric Tull *(Birdfinding in Canada* Vol. #1) has proposed the "big minute". The minute list can be done in many ways: "the quick minute" performed while running, riding a bicycle or from a car. In concentrated birding habitats the results could be impressive. The "slow minute" (the small sit as opposed to the big sit) might mean just that — a minute sitting on a grassy knoll (good for hawks in season) or a minute walking down a prairie road in mid-wnter (good for nothing). Then there could be the "group minute" and the "individual minute". The possibilities are almost endless, and the rules!

An exciting listing game which is within the reach of everyone, even if you can't leave the house, is "birding the brochures." With a supply of maps and the latest birding tour catalogues (some are fat little booklets) you can list Scarlet Ibis on the Coppename River, Great Blue Turaco in the Kakamega Forest, Golden bower bird on the Atherton Tablelands, White-breasted Kingfisher at Ma'agan Mikhael and a Purple-throated Fruit Crow on the Pipeline Road without suffering dysentery, biting insects and a leaner bank account.

Another kind of listing (more like old-time birdwatching) is window listing. This is part and parcel of yard (back and front) listing, feeder listing, and estate (for farmers and ranchers) listing. Window birding is great for those who are confined to the house or the office. I think window birding should be given more priority. Most of us spend much of our time in the house or the office usually within eyeball range of a window.

Last year I saw sixty-one species from my office window overlooking the inner harbour in downtown Victoria. My list included three species of loon, seven raptors including bald eagle and peregrine falcon, Caspian tern, pigeon guillemot and marbled murrelet.

Finally, there is another form of birding which should be more popular. That is birding from the sack. Travel-camping and birding go together like a peanut butter sandwich. But Birders sometimes make themselves unpopular with companions and spouses because of their propensity for rolling out bleary-eyed in the pre-dawn darkness and disturbing others.

Why not camp in a good birding spot, wake up with the owls, but stay in the sack, listen and identify birds by their songs? Bird sounds and their identification is one of the many joys of birding. Again, the variations on this theme are many and you might even get your reluctant companion excited about birding too!

If you want to get more involved in birding read:
Birdfinding in Canada edited by Gerry Bennett, Box 519, Kleinburg, Ontario L0J 1C0 or
Birding, American Birding Association, Box 4335, Austin, Texas 78765.

Raptor Collisions with Utility Lines

A Call for Information

The U.S. Bureau of Land Management, Sacramento, in cooperation with the Pacific Gas and Electric Company, is assembling all available published and unpublished information concerning collisions of raptors with power lines and other utility lines. Actual case histories, no matter how circumstantial or fragmentary, are needed. Please acknowledge that you have such information by writing to Dr. Richard R. (Butch) Olendorff, U.S. Bureau of Land Management, 2800 Cottage Way, Sacramento, California 95825 U.S.A. (Phone (916) 484-4541). A form on which to record your information will then be sent by return mail.

New Publications

Biology and Management of Bald Eagles and Ospreys

A proceedings of 32 referred papers (325 pp.) by over 50 international experts on topics including taxonomy, distribution, winter and breeding population dynamics, nesting habitat and nest site selection, nutritional ecology, prey selection, and management of the North American Bald Eagle and the cosmopolitan Osprey.

Rate: $18 (CDN) plus $3 handling. All profits to Raptor Research Foundation, Inc. Write: David M. Bird, Raptor Research Centre, 21111 Lakeshore Rd., Ste. Anne de Bellevue, Quebec H9X 1C0.

An Owl for the Digging

photo: Richard Cannings

The Burrowing Owl *(Athene cunicularia)* was nearly extirpated as a breeding species in British Columbia during the 1970s. It was designated as an endangered species in B.C. in March, 1980.

Following that designation, a number of discussions on possibilities and methods of reintroducing the species were held which culminated with an agreement among the Fish and Wildlife Branch, the Federation of B.C. Naturalists and the University of B.C. to support the preparation of an annotated bibliography of Burrowing Owls and a preliminary recovery plan for the species in British Columbia. On the basis of that work, the Fish and Wildlife Branch prepared a pilot program for reintroduction of the species in the spring of 1983.

Two sources of birds were available to us, adult and young wild birds from Washington state and one-year-old captive-bred birds from the Owl Rehabilitation Foundation in Ontario. Therefore, we designed our program to make use of both sources of birds. Two separate sites for release were chosen, both within the historical breeding range of the species, and both with some kind of secure tenure. One was in the Okanagan and one was in the Nicola area. The site in the Okanagan was on Canadian Wildlife Service property and the site in the Nicola was on the Douglas Lake Ranch. A number of artificial burrows were constructed for each site. Each consisted of a nest chamber measuring 30 cm by 30 cm by 20 cm and a 10 cm by 10 cm tunnel about 2 m in length with a right-angle turn about 60 cm from the nest chamber. The artificial burrows were buried with a downward slant so that the nest box was about 30 cm below ground level.

Okanagan Site

We placed 13 artificial burrows on the proposed release location in three groups. Each group had a 2½ m perching pole adjacent to it. A large 10 m by 4 m by 1.8 m flight cage made of stretched, soft, fine-mesh seine netting was constructed over three of the burrows and two 1 m perching poles were placed inside. An observation blind was constructed on a hill about 100 m away from the cage. A prescribed burn was conducted on a portion of the area to reduce old vegetation and encourage new growth.

In early June, Fish and Wildlife staff joined Washington State Wildlife staff near Moses Lake to capture a wild burrowing owl family.

The two adults and nine young were flown to the Okanagan and released in the holding pen on June 7, 1983. The owlets were placed directly in the nesting chamber, fed until satiated, and then the chamber was closed and covered with earth. Each adult owl was held for a few moments near the burrow entrance to allow it to fix its vision on the burrow entrance and then was released to enter the burrow on its own to join its young. Both adults emerged from the burrows within two hours of release. Throughout the capture, transportation and holding process, every possible effort was made to reduce stress on the owls.

The owls were observed continually from the blind for the first seven days and then at least once per day thereafter. During that time, dead mice and voles were left in the cage. The adults were observed taking food into the burrows and after a few days, the young emerged and were fed by the female adult outside the burrows. Very few attempts were made to escape. The enclosure was removed on June 16. The adults remained in the area and continued to feed the young with both food provided in diminishing amounts by us and food caught by themselves. Pellet examination showed that insects made up the bulk of the diet. The owls left the release site in mid-July after the young had fledged and were not reported again in B.C. The burrows were opened on August 2 and a leg band from one of the young was found in the burrow normally used only by the adult female. It appeared that one of the young had been eaten by one or both of the adults. We have no reason to suspect the other young did not survive.

Given the successful rearing of young to the fledging stage in 1983, we will attempt, with the cooperation of the Washington Game Department, to obtain five pairs of adults and their young for transplant in 1984. A major effort of that magnitude should provide evidence as to whether or not the young will return to breed in the area where they are released.

Nicola Site

We placed 15 artificial burrows on the proposed release site, loosely grouped in four locations. We anticipated that the groupings would allow sufficient foraging areas for at least three pairs of owls and their young.

We built four holding cages of chicken wire and 5 cm by 5 cm framing. Each had dimensions of approximately 183 cm on a side and in height. Hinged doors provided access and were fitted with small padlocks for security. When installed, the holding cages were inconspicuous from the main travelled road. In addition, a locked gate controlled by Douglas Lake Ranch protected the site from possible vandalism.

Larry McKeever, Owl Rehabilitation Research Foundation, Vineland, Ontario, delivered seven yearling owls on April 29. We put them in cages placed over burrows in four locations. Three cages held a male and female while a lone female occupied a fourth cage. Cages were removed from 5 birds on May 2 and from the remaining pair on May 31.

Mrs. Dianne Murphy volunteered to watch over, feed, and record notes on the penned owls. Excerpts from her notes were used to summarize events after the introduction. Michael Murphy collected mice and voles for daily feeding.

When released (near noon, May 2, 1983), all five birds were able to fly strongly and one was followed for several hundred metres by a photographer. However, they remained in the vicinity of the release site throughout the afternoon and at 7:30 p.m., two were at one burrow and one each at two other burrows. The remaining pair was fed two fresh mice or voles daily until their re-

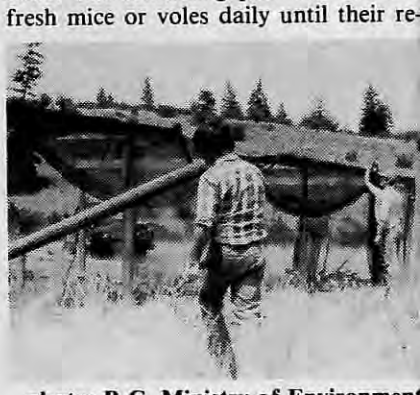


photo: B.C. Ministry of Environment

lease on May 31. The pair remained at the burrow after the confining cage was dismantled, and by 7:30 p.m., a male still remained.

The following day, despite searching the general area, the owls could not be found. None was seen until June 30 when a pair was seen at one burrow. From then until August 31, birds or fresh signs were seen intermittently at burrow entrances.

Cursory examination of summer pellets by Dianne Murphy showed that much of the diet was insect and that beetles were the most common of the insects found.

We cannot evaluate the results of this year's project until spring when the owls may or may not return. Next summer, with birds from the Owl Rehabilitation Research Foundation, we propose to release two pairs of owls at the same site and two pairs at a more heavily grazed site either at Douglas Lake Ranch or nearby. In addition, we plan to excavate an additional 25 artificial burrows to attract any free ranging birds that may occur in the area.

If we do not obtain returns after three summers releases of yearling birds, we will try raising birds for release from captured broods or broods raised in captivity near the release site.

We believe the 1983 pilot program showed that birds could be introduced by two distinct methods and survive for at least a few months. Slight improvements on the techniques gained from our experience in 1983 should increase the chances of success in 1984. It will be at least two or three years before we know if the program will probably mean the long-term establishment of the burrowing owl as an unendangered breeding species in B.C.

Acknowledgments

Many agencies, organizations and individuals contributed to this program. Special thanks must go to Kay and Larry McKeever of the Owl Rehabilitation Research Foundation who supplied the 7 one-year-old owls for the Nicola area and to the Washington State Department of Game for supplying the 11 owls for the Okanagan area. Ron Friez of that agency was particularly involved in the capture of the owls. The World Wildlife Fund (Canada) provided financial support through the Federation of B.C. Naturalists for the literature research and preparation of recovery plans. The Habitat Conservation Fund provided operational funds for the Okanagan transplant. We would also like to thank the many individuals within our agency and the individual naturalists who helped in a great variety of ways. This article was adapated from a paper prepared by W.T. Munro, R.C. Lincoln and R.W. Ritcey and presented to the Pacific Northwest Bird and Mammal Society, January 14, 1984.

NOTE

It is hoped that a large number of owls will be available for the 1984 program. Small rodents, particularly voles, will be needed to feed the owls. Anyone who may wish to collect small rodents for the program and freeze them, please call Bob Lincoln, Penticton, 493-8261, when you have at least 20, and they will pick them up.

W.T. Munro
Fish and Wildlife Branch
B.C. Ministry of Environment

B.C. Christmas Bird Counts — 1983

For most birdwatchers in North America, the high point of the birding year is undoubtedly the Christmas Bird Count. Last winter a healthy total of 44 Christmas counts were held in British Columbia, exceeding the previous year by one. New counts included Cranbrook, North Pine, Sooke, and Tofino, while reports were not received from Cortes Island, Mackenzie, and Qualicum-Parksville.

In all, 1504 observers tallied 204 species and 704,699 individual birds! Most groups held their counts during the official count period of Dec. 17, 1983 to Jan. 2, 1984, and followed the rules of counting birds on one calendar day and within a set 15-mile diameter circle. The 33 "official" counts submitted (indicated below by "AB" after the title) will have their complete results, with those of the 1300+ other counts held across North America, published in the July-August 1984 issue of **American Birds,** the journal of the National Audubon Society.

We have room here for only a short summary of the totals and highlights of each British Columbian count. For each count these include: date, number of observers, number of bird species, number of individual birds, a short list of noteworthy species selected for their rarity, impressive numbers, or uniqueness in B.C., sponsoring club (if any), and compiler or count organizer.

Vancouver's record-breaking total of 142 species was the province's highest this year, while Victoria was close behind with 139, also tying their previous high. Most other counts were also very successful this year, many setting all-time high species totals. Vernon became the first inland Western Canadian count to reach the magic 100 mark (ta-dah!), while Penticton was close behind at 98. So many new Canadian highs were set for individual species we couldn't possibly mention them all. Two of the notable totals were 508 Trumpeter Swans at Comox and 1396 Bald Eagles at Squamish. The "Bird-of-the-year" award undoubtedly goes to the two Bramblings which showed up at Mary Morris' feeder on the Skidegate Inlet count; other good species included a Sooty Shearwater at Victoria, the first well-documented sighting on a Canadian count, a Black-crowned Night-Heron at Ladner, and a Northern Waterthrush at Oliver-Osoyoos. Nanaimo reported a Black-capped Chickadee, one of the very few sightings ever from Vancouver Island.

Count compilers are urged to enclose field descriptions of highly unusual species. These descriptions will be passed on to the Provincial Museum where they will remain on file permanently. Several species, either rare or previously unknown in B.C. in the winter, had to be dropped from count lists this year because they were unaccompanied by details of the sightings. These species include: Least Grebe, Blue-winged Teal, Osprey, Swainson's Hawk, Ferruginous Hawk, Bonaparte's Gull (in the Interior), Least Auklet, Barn Swallow, House Wren, Swainson's Thrush, Chipping Sparrow, and White-winged Crossbill (on the southern coast).

A notice giving dates and other details for the 1984-85 Christmas Bird Count will be included in a later edition of the **B.C. Naturalist.** We sincerely thank all count compilers and observers for their efforts, and although this year will be hard to beat, we hope you all have an even better Christmas Count next year!

Campbell River (AB) — Jan. 2; 29 obs., 88 spp., 27,087 indiv. 28 Black-bellied Plovers, 1,219 Common Mergansers, 11,103 Glaucous-winged Gulls, 1,155 Common Murres, 52 Pine Grosbeaks, 177 Red Crossbills, 2,434 Pine Siskins. **(Mitlenatch Field Naturalists; Elaine Sanderson.)**

Chilliwack (AB) — Dec. 17; 26 obs., 70 spp., 20,191 indiv. 330 Bushtits, 18 American Dippers, 22 Brown-headed Cowbirds. **(Chilliwack Field Naturalists; Doug May.)**

Comox (AB) — Dec. 18; 39 obs., 102 spp., 31,328 indiv. 638 Arctic Loons, 508 Trumpeter Swans, 12 Redheads, 1 Golden Eagle, 2 Lesser Yellowlegs. **(Comox-Strathcona Naturalists: Walter Fitzpatrick.)**

Cranbrook (AB) — Dec. 29; 4 obs., 25 spp., 591 indiv. 1 Great Blue Heron,, 1 Common Snipe, 201 Common Ravens. **(Marian Porter.)**

Deep Bay (AB) — Dec. 27; 17 obs., 85 spp., 28,752 indiv. 15,174 Western Grebes, 424 Bald Eagles, 14 Greater Yellowlegs. **(Comox-Strathcona Naturalists; Erma and Walter Fitzpatrick.)**

Duncan (AB) — Dec. 17; 20 obs., 108 spp., 22,033 indiv. 118 Mute Swans, 2 Barn Owls, 2 Hermit Thrushes, 1 Harris' Sparrow, 1 Lincoln's Sparrow. **(John Comer.)**

Grand Forks (includes Christina Lake and Midway) — Dec. 26 & 30; 34 obs., 71 spp., 2,701 indiv. 23 Gray Partridge, 1 Hawk Owl, 1 Long-eared Owl, 1 Lewis' Woodpecker, 30 White-winged Crossbills, 30 Rosy Finches, 1 Harris' Sparrow. **(Boundary Naturalists; Daphne Hamilton.)**

Kamloops — Dec. 17; 14 obs., 65 spp., 3,182 indiv. 1 Ring-necked Pheasant, 1 Snowy Owl, 46 Chukar, 2 Sharp-tailed Grouse, 147 Mountain Chickadees, 3 Harris' Sparrows, 1 Golden-crowned Sparrow. **(Kamloops Naturalists; Rick Howie.)**

Kelowna — Jan. 2; 33 obs., 82 spp., 6,913 indiv. 2 Tundra Swans, 2 Mute Swans, 3 Lewis' Woodpeckers, 18 American Dippers, 1 Ruby-crowned Kinglet, 1 Rufous-sided Towhee. **(Central Okanagan Naturalists; Brian Holmes.)**

Kitimat (AB) — Dec. 17; 9 obs., 34 spp., 2,901 indiv. 4 Trumpeter Swans, 2 American Dippers, 3 Rusty Blackbirds. **(Dennis Horwood.)**

Ladner (AB) — Dec. 27; 59 obs., 137 spp., 125,306 indiv. 1 Yellow-billed Loon, 9 American Bitterns, 1 Black-crowned Night-Heron, 8 Cinnamon Teal, 20 Eurasian Wigeon, 93 Red-tailed Hawks, 23,002 Dunlin, 2 Blue Jays, 1 Black-billed Magpie, 15 Bohemian Waxwings, 1 Lapland Longspur. **(Jude Grass, compiler, Wayne Weber, asst. compiler.)**

Lake Windermere District (AB) — Dec. 26; 18 obs., 38 spp., 1,883 indiv. 31 Townsend's Solitaires, 4 Starlings (!), 67 Pine Grosbeaks. **(Ian Jack.)**

Masset (AB) — Dec. 17; 22 obs., 75 spp., 6,361 indiv. 1 (Eurasian) Green-winged Teal, 1 Redhead, 3 Peregrine Falcons, 3 Least Sandpipers, 10 Long-billed Dowitchers. **(Delkatla Wildlife Sanctuary Committee, Peter Hamel.)**

Nakusp (AB) Jan. 2; 11 obs., 44 spp., 2,937 indiv. 1 Gadwall, 15 Varied Thrushes, 2,060 Pine Siskins. **(Gary Davidson.)**

Nanaimo (AB) — Dec. 27; 25 obs., 109 spp., 17,323 indiv. 214 Trumpeter Swans, 2,008 American Wigeon, 1 Ruddy Turnstone, 1 Black-capped Chickadee. **(Nanaimo Field Naturalists; Peter van Kerkoerle.)**

North Pine (AB) — Dec. 20; 2 obs., 16 spp., 325 indiv. 2 Snowy Owls, 4 Blue Jays, 150 Snow Buntings, 6 Hoary Redpolls. **(Rhonda Anderson, Joan Johnston.)**

Oliver-Osoyoos (AB) — Dec. 29; 31 obs., 92 spp., 6,626 indiv. 1 Yellow-billed Loon, 193 Chukar, 1 Black-backed Woodpecker, 172 Red-breasted Nuthatches, 1 Northern Waterthrush, 1 Brown-headed Cowbird. **(Oliver-Osoyoos Naturalists; Sydney Cannings, Joan King.)**

Pender Islands (AB) — Dec. 20; 13 obs., 75 spp., 11,807 indiv. 530 Arctic Loons, 3,667 Brandt's Cormorants, 2 Peregrine Falcons, 40 Bonaparte's Gulls, 592 Common Murres, 1 Barred Owl, 5 Hermit Thrushes. **(Pender Islands Field Naturalists; R. McLardy.)**

Penticton (AB) — Dec. 27; 59 obs., 98 spp., 13,634 indiv. 8 Northern Goshawks, 1,032 California Quail, 10 Northern Pygmy-Owls, 126 Clark's Nutcrackers, 401 Red-breasted Nuthatches, 1 Yellow-rumped Warbler. **(South Okanagan Naturalists; Richard and Steve Cannings.)**

Pitt Meadows (AB) — Dec. 27; 23 obs., 87 spp., 28,366 indiv. 1 American Bittern, 1,315 Canada Geese, 1 Lewis' Woodpecker, 244 Varied Thrushes. **(Alouette Field Naturalists; Wilma Robinson.)**

Prince George — Jan. 8; 16 obs., 24 spp., 988 indiv. 1 Merlin, 1 Short-eared Owl, 372 Common Redpolls, 7 Hoary Redpolls. **(Prince George Naturalists; Don Wilson.)**

Prince Rupert (AB) — Dec. 27; 10 obs., 50 spp., 3,225 indiv. 2 Yellow-billed Loons, 60 Bald Eagles, 31 Black Oystercatchers, 4 Pine Grosbeaks. **(Prince Rupert Naturalists; Doug Innes.)**

Quesnel (AB) — Dec. 27; 1 obs., 11 spp., 123 indiv. 1 Cooper's Hawk, 10 Brewer's Blackbirds. **(Calvor Palmateer.)**

Revelstoke (AB) — Dec. 21; 16 obs., 49 spp., 6,253 indiv. 1,097 Canada Geese, 761 Mallard, 1 Red-tailed (Harlan's) Hawk, 2 Rusty Blackbirds, 3,277 Pine Siskins. **(John Woods.)**

Salmon Arm — Dec. 29; 27 obs., 51 spp., 2,482 indiv. 18 Tundra Swans, 479 American Crows, 1 Rufous-sided Towhee, 1 Harris' Sparrow. **(Shuswap Naturalist; Deane Munro.)**

Saltspring Island — Dec. 18; 145 (!!) obs., 106 spp., 24,823 indiv. 1 Yellow-billed Loon, 8 Snow Geese, 230 Hooded Merganser, 1 Ruddy Turnstone, 5 Rhinoceros Auklets, 2 Northern Pygmy-Owls. **(Saltspring Trail and Nature Club; Marguerite Pearce.)**

Sayward (AB) — Dec. 20; 6 obs., 57 spp., 1,775 indiv. 73 Trumpeter Swans, 3 American Dippers, 1 Hermit Thrush. **(Jean Bishop.)**

Shuswap Lake (AB) — Dec. 28; 18 obs., 59 spp., 2,670 indiv. 441 Tundra Swans, 13 Trumpeter Swans, 14 Ring-necked Ducks, 12 Varied Thrushes. **(North Shuswap Field Naturalists; Rick Howie.)**

Skidegate Inlet (AB) — Dec. 18; 11 obs., 73 spp., 7,180 indiv. 4 Ruddy Turnstones, 825 Black Turnstones, 1 Red-breasted Sapsucker, 1 Hermit Thrush, 3 Yellow-rumped Warblers, 2 Townsend's Warblers, 2 Brambling, 32 Pine Grosbeaks. **(Delkatla Wildlife Sanctuary Committee; Peter Hamel.)**

Smithers (AB) — Dec. 19; 26 obs., 40 spp., 1,523 indiv. 1 Golden Eagle, 1 Willow Ptarmigan, 19 White-tailed Ptarmigan, 13 Boreal Chickadees, 76 White-winged Crossbills. **(Bulkley Valley Naturalists; Dave Hatler, Ros Pojar.)**

Sooke (AB) — Dec. 31; 38 obs., 106 spp., 17,003 indiv. 72 Black Oystercatchers, 127 Steller's Jays, 916 Golden-crowned Kinglets, 2,704 Pine Siskins. **(Michael Shepard.)**

Squamish (AB) — Jan. 2; 25 obs., 73 spp., 9,428 indiv. 31 Trumpeter Swans, 4 Northern Shovelers, 1,396 Bald Eagles, 39 American Dippers. **(Richard Cannings.)**

Sunshine Coast (AB) — Dec. 17; 18 obs., 92 spp., 11,755 indiv. 1 Mute Swan, 172 Surfbirds, 482 Ancient Murrelets, 1 Mountain Chickadee, 1 Hermit Thrush. **(Tony Greenfield.)**

Terrace (AB) — Dec. 26; 12 obs., 42 spp., 2,233 indiv. 373 Mallard, 1 Barred Owl, 1 Three-toed Woodpecker, 1 American Tree Sparrow. **(Diane Weismiller.)**

Tofino — Dec. 25; 1 obs., 66 spp., 1,806 indiv. 76 Brant, 191 Varied Thrushes, 18 Yellow-rumped Warblers, 1 Lincoln's Sparrow. **(Adrian Dorst.)**

Vancouver (AB) — Dec. 18; 173 obs., 142 app., 134,233 indiv. 2 Yellow-billed Loons, 3 Cinnamon Teal, 1 Tufted Duck, 1 King Eider, 1 Golden Eagle, 1 Sora, 2 Barred Owls, 1,212 Varied Thrushes, 1 Orange-crowned Warbler, 1 White-throated Sparrow. **(Vancouver Natural History Society; Wayne Weber.)**

Vaseux Lake (AB) — Dec. 23; 16 obs., 77 spp., 5,204 indiv. 41 Pied-billed Grebes, 324 Mountain Chickadees, 359 Red-breasted Nuthatches, 21 Canyon Wrens, 4 Western Bluebirds, 374 Red Crossbills, 6 White-winged Crossbills. **(Richard Cannings.)**

Vernon (AB) — Dec. 18; 62 obs., 100 spp., 22,551 indiv. 1 Yellow-billed Loon, 530 Common Mergansers, 9 Harris' Sparrows, 1,510 House Finches. **(North Okanagan Naturalists; Jim Grant.)**

Victoria (AB) — Dec. 17, 115 obs., 139 spp., 25,822 indiv. 1 Sooty Shearwater, 87 Eurasian Skylarks, 24 Hermit Thrushes, 254 Fox Sparrows, 1 Swamp Sparrow, 2 White-throated Sparrows, 2,880 Dark-eyed Juncos, 322 Red Crossbills. **(Victoria Natural History Society; Michael Shepard.)**

West Kootenay — Jan. 7; 81 obs., 79 spp., 8,334 indiv. 30 Bald Eagles, 5 Three-toed Woodpeckers, 1 Barred Owl, 1 Rufous-sided Towhee, 1 Rosy Finch. **(West Kootenay Naturalists; Jim Street.)**

White Rock (AB) — Jan. 2; 43 obs., 111 spp., 53,545 indiv. 1 American Bittern, 13,704 Dunlin, 1 Glaucous Gull, 138 Steller's Jays, 1 Loggerhead Shrike, 12,293 Starlings, 1 White-throated Sparrow, 35 Brown-headed Cowbirds, 1,259 House Finches. **(White Rock and Surrey Naturalists; Madelon Schouten.)**

Williams Lake — Jan. 2; 31 obs., 28 spp., 1,496 indiv. 2 Northern Goshawks, 18 Hairy Woodpeckers, 650 American Crows, 3 American Dippers, 50 Common Redpolls. **(Williams Lake Field Naturalists; Anna Roberts.)**

Richard Cannings and Wayne Weber
Vancouver

Three-tip Sagebrush
(Artemisia tripartita)

Similar to our Big Sagebrush (*Artemisia tridentata* sbsp. *tridentata)* this species differs in being a low shrub with highly dissected three-part leaves. I was lucky to find it and then verify it from near the old Beresford School in the Knutsford area. These are the first "northern" collections known to us.

This occurrence is of extreme interest because of its paleobotanical implications. Recent work by Richard Hebda of the B.C. Provincial Museum has established that grasslands were formerly far more widespread than today, occurring well up into today's "subalpine transition" forest. This was at the time of the post-glacial warm period. Since existing "zones" were pushed up to higher elevations under the warmer, drier conditions, it would also follow that "zones" from the south would be pushed further north. Hence the intrigue with the three-tip sagebrush find.

Three-tip sagebrush is an ecologically important species, for with Idaho fescue (*Festuca idahoensis*), it defines the upper elevation sagebrush zone of Washington and Oregon. This zone reaches its northernmost distribution in the Okanagan and Similkameen Valleys. Both species were formerly associated with these southern confines, but recent surveying has discovered a new northern locality for Idaho fescue at Ashcroft.

So we now have evidence that both these major species are present in the Kamloops area. My hypothesis is that the three-tip sagebrush-Idaho fescue zone was formerly present in our area. This was at the time of the post-glacial warm era and grassland maxima. Subsequent cooling and moistening of the climate has shrunk the available habitat and displaced the zone to the south, leaving only today's relict populations.

Wayne Erickson
Kamloops

Protection for Canada's Heritage Rivers

In January 1984 federal Environment Minister Charles Caccia announced the creation of the Canadian Heritage Rivers System (CHRS). This new program, established by the federal government in cooperation with five provinces and two territories, will give national recognition to rivers which are significant examples of our natural environment, which have played an important role in Canadian history, or which offer outstanding recreational opportunities.

Rivers in the CHRS will continue to be owned and managed by the federal, provincial or territorial government having jurisdiction, in a way which will ensure that their distinctive heritage values are protected and opportunities are provided for public use and enjoyment. Mr. Caccia stated that the governments of Saskatchewan, Manitoba, Ontario, New Brunswick, Newfoundland, and Yukon and the Northwest Territories, along with the federal Minister of Indian and Northern Affairs, John Munro, have agreed to take part in their establishment of a Canadian Heritage Rivers board and have expressed their intention to nominate rivers for inclusion in the System over the coming years. The Minister of the Environment said that he hoped the remaining governments would also join in this excellent example of federal-provincial cooperation.

The federal government, through Parks Canada, will provide administrative and technical support to the Board and will carry out information programs to promote public awareness of the CHRS.

"Some of our rivers have changed little since man first saw them thousands of years ago," Mr. Caccia said, "but they have been developed and exploited without thinking of the consequences. The CHRS shows the growing recognition, on the part of the governments of this country, of the need to make wise use of our limited water resources."

Establishment of the Canadian Heritage Rivers System follows from the recommendations of a federal-provincial-territorial task force established at the request of the Honourable Hugh Faulkner, who was then Minister responsible for Parks Canada.

British Columbia has, of this date, not joined the Federal government in this program. It would be beneficial for all of us to encourage British Columbia to be a party to the Canadian Heritage River System. Write your elected official indicating your support.

Robin Draper
Outdoor Recreational Council of B.C.

OOPS, SORRY

A sincere apology to Michael Shepard and Swiftsure Tours of Victoria for the wrong ad which appeared in the last edition — Spring 1984.

First Place Photo

Congratulations to Don McPhee of the Chilliwack Field Naturalists for his first place waterfowl photograph taken at Sardis Lake, for the Ducks Unlimited Photo Contest.

FINAL RESOLUTION OF SKAGIT ISSUE

On Friday, 30 March 1984, representatives of the Province of B.C. and the City of Seattle signed an agreement resolving their dispute over the proposed raising of Ross Dam by the City of Seattle and the resulting flooding in B.C. This agreement was in turn confirmed by the signing of the Skagit River Treaty between Canada and the U.S.A. on 3 April which committed the federal governments to supporting the agreement between the Province and the City.

The dispute has lasted from 1967 when the Provincial Government of that time agreed to permit the flooding for a derisory sum while losing some outstanding recreation and wildlife land.

Much credit for achievement of the solution goes to the present provincial government which decided in 1976 to attempt to re-negotiate a solution. Within the government the Honourable Stephen Rogers, which Minister of Environment, was directly responsible for the achievement in 1983 of the agreement in principle, which led to the present agreements. In this he was strongly supported by Ben Marr, his Deputy, and Robin Round of the Water Resources Branch.

A summary of the terms of the agreement are:

1. Seattle will not further flood the Canadian Skagit Valley.
2. British Columbia will supply Seattle with electrical capacity and energy which is roughly equivalent to that which would have been produced by High Ross Dam.
3. Seattle will pay British Columbia $21,848,000 (US) per year for 35 years, beginning in 1986, or the same as it would have paid to build High Ross had it borrowed money in December, 1982.
4. British Columbia is to pay wheeling (power transmission) costs from Blaine to Seattle.
5. British Columbia can raise Seven Mile Dam on the Pend d' Oreille River near Trail and flood Seattle-owned land without compensating Seattle. This is equivalent to 50% of High Ross energy, and will cause 140 acres of flooding in B.C. and 60 acres in Washington State.
6. The agreement is for 80 years; 1986-2066. Funding over the first 35 years is substantially in excess of energy costs. The B.C. energy surplus in early years, the investment options using Seattle payments, and the Seven Mile availability throughout the agreement are considered of sufficient value to compensate B.C. over the 80-year term.
7. The parties will review the terms and conditions of the Agreement at future intervals.
8. Seattle may terminate the agreement by giving five years notice. It would then forfeit any right to flood the Skagit Valley. British Columbia may terminate the agreement by giving five years notice. Seattle would then be permitted to flood the Skagit Valley without paying compensation to British Columbia other than the continued right to flood U.S. territory behind the Seven Mile dam. If Seattle chooses not to flood, British Columbia must provide Seattle 1.05 MW as compensation for Seven Mile (approximately 5% of additional output); British Columbia would retain full rights to Seven Mile. If Seattle chooses to flood, British Columbia will return to Seattle a sum sufficient to construct High Ross at that time, less the capitalized value in that year of Seattle's unpaid payments; B.C. retains full rights to Seven Mile.
9. The Agreement provides the mechanism for resolution of disputes.
10. Seattle will be the main contributor to an Environmental Endowment Fund. Total initial funding will be $5,000,000 with Seattle contributing $4,000,000; a large majority of expenditures will be made on B.C. side of border. The fund will be enhanced annually by both parties.
11. Seattle will cede to the Province its privately-held land in British Columbia (640 acres).
12. The agreement will be implemented with a treaty between Canada and the U.S.

The major lesson of this long dispute is that once a mistake in land use allocation is made, it is a long and difficult business to try and correct it.

As for the future, people of the Lower Mainland can look forward to the enhancement of the Skagit for wildlife and recreation. However, not all the argument is over, it first has to be established what land use regime will be implemented in the Skagit. The Parks Branch desired to maintain the Recreation Area status, allowing some commercial forestry. Many who argued for the Skagit over the years would prefer to see Class A park status. That argument has yet to be resolved, but it is hoped that the Environmental Endowment Commission created by the agreement will assist in its resolution.

At this point the ROSS Committee considers its prime objective has been met and must now consider its own future. The strong support given by the Federation of B.C. Naturalists and its members over the years was most helpful and greatly appreciated.

Ken Farquharson

A note regarding this contribution by Ken Farquharson. Of all the contributions to a solution to the Skagit issue Ken's contribution must be the greatest. For over a decade he had kept the R.O.S.S. committee views before government and the media, and has maintained committee coherence. A lesson for the F.B.C.N. is that to achieve worthwhile objectives in conservation of natural features persistence over long periods, vigilance at all times, and the cooperative participation of people from many backgrounds are required. In this case especially Ken's knowledge of the hydro power engineering needs of B.C. has been particularly valuable. Our special thanks must go to Ken.

Norman Purssell
Bert Brink

ROAD KILLS

Wild animals are protected from hunting in National Parks, but increasing numbers of them are being killed by vehicles.

Kootenay National Park contains 94 kilometres of highway, most of it bordered by grassy clearings which are grazed by elk, deer and bighorn sheep. Park Warden Brian Sheehan reported that last year 39 large mammals and numerous smaller animals were killed on the highway. The death toll includes 26 elk, 4 mule deer, 5 whitetail deer, 1 moose, 3 bighorn sheep, 4 coyotes, 6 porcupine, 2 snowshoe hare and 1 beaver. The greatest hazard for roadside feeders exists on autumn nights when road conditions make emergency stopping difficult and visibility poor.

Most of the road kills are dumped in designated areas close to public access. There, they soon become food for coyotes, ravens, bears and other scavengers. In this small way, the natural life cycle of the animal is completed despite its unnatural death.

Article & Photo by
Larry Halverson
Park Naturalist
Kootenay National Park

Ecological Reserves

The A.G.M. of the Ecological Reserves Program was held on February 24th at U.B.C. Reports heard during the morning session revealed that, although no new reserves were established last year, significant efforts have been put into program assessment and planning. Topics included cost benefit analysis in assessing forest reserve proposals, ecological inventory of existing reserves by wardens, and a proposed system to establish permanent plots and conduct long-term eco-monitoring in reserves by wardens and other interested parties.

Hans Roemer, Ecological Reserves staff member, presented a system which will be used to organize land use acquisition priorities with respect to long-term goals.

Dr. Tom Reimchin's research on sticklebacks in an ecological reserve on Graham Island (Queen Charlotte's) suggested that reserves will be of economic benefit in involving applied ecological projects.

Proposals for new ecological reserves were discussed. There was optimism that some of these will soon be established as Ecological Reserves.

In the afternoon Wardens met to discuss their specific concerns while the Board of Directors met with the Hon. Anthony Brummet. The Minister expressed support for the Ecological Reserves Program and his interest in further meetings with the Board to discuss issues in more detail.

Alison Watt
Friends of Ecological Reserves

NOTE: The Government is in the process of revising the composition of the Ecological Reserves Board and it's objectives. Possibly by the next issue of the B.C. Naturalist we will have a full report.

Bert Brink

FRONT COVER

MARSH WREN
(Cistothorus palustris)

One of the most distinctive and pleasurable sounds of the spring marshes is the song of the Marsh Wren described as "a series of loud, rapid, reedy notes and liquid rattles." The Marsh Wren sings both day and evening in the breeding season. It has the interesting habit of building several 'dummy' nests along with the nest in which its eggs are laid.

The picture was kindly provided by **Tim Fitzharris,** a well-known B.C. wildlife photographer. Tim has just moved to White Rock from Vancouver Island where he is working on two new books, "Wildflowers of Canada" due out in 1986, and "British Columbia: A Natural History," due out next fall. His photographs and articles have appeared in numerous magazines including *Audubon* and *National Geographic,* and he is the author of three excellent books on nature and nature photography.

BIRD ALERT: New Phone Numbers

Both the Victoria Natural History Society Bird Alert, operated by Vic and Peggy Goodwill, and the Vancouver Natural History Society Bird Alert, now operated by Mike Force, have new phone numbers. Birders should note these numbers and use them when visiting these areas to locate the rare, unusual or interesting sightings.

Victoria: 382-5562 Vancouver: 876-9690

PHOTOS WANTED

We are looking for cover shots and other captioned photo's for the B.C. Naturalist.

Cover shots should have a seasonal theme and be black and white prints no smaller than 8x10. Other submissions should also be black and white prints and no smaller than 5x7 with good contrast. Portfolios also accepted.

Please label with subject matter or title, name, address, phone number. Use PENCIL only and DO NOT write on picture, press or use labels. All photos will be returned.

MEMBERSHIP

☐ Regular	$10.00	☐ Active	$25.00	☐ Patron	$100.00
☐ Sustaining	$15.00	☐ Contributing	$50.00	☐ Life	$200.00

☐ Affiliate (non-profit organization)—**$10.00 and up.**
☐ Associate (profit organization)—**$10.00 and up.**

Send to:

Membership Chairman F.B.C.N.
100-1200 Hornby Street, Vancouver, B.C. V6Z 2E2

Name.....
Address.....
.....
Postal Code .....
Membership Class.....
Amount Enclosed $.....
Renewal .....
New.....

The Rare Plants of the Queen Charlotte Islands

Lying off the British Columbia coast between 52° and 54° north latitude, the Queen Charlotte Islands are about as far north as Prince George, Edmonton, or Prince Albert, in the boreal parts of mainland Canada. Despite their recent fame as the "Canadian Galapagos" the Islands are not tropical; there are no tree ferns, palms, or epiphytic orchids. But there are a large number of unique and rare plants.

Though relatively remote, the Queen Charlotte Islands are better known botanically than any other part of British Columbia. This is because of the excellent *Flora of the Queen Charlotte Islands,* published in 1969, by James Calder and Roy Taylor. This book was the outcome of several years' field collecting of approximately 38,000 specimens, plus the study of Queen Charlotte collections at nine other herbaria. It is a most useful manual for identifying the plants of the Islands and also contains a detailed analysis of the geographic distribution of the flora: where else the species occur — whether northward to Alaska and Siberia, south to California, eastward to the Rocky Mountains (cordilleran), or all around the northern polar regions (circum polar).

Calder and Taylor found 593 species and subspecies of plants, of which 476 are indigenous. Thus, the Island flora is very poor in species; for example, there are no Douglas fir, true firs, maples, birches, poplars, and only one pine species. Of the native plants, about 50% are restricted to North America, 30% are circumpolar, and 20% range northward up the coast and across the Bering Strait to Asia. Of the North American species, about 40% area coastal, 40% cordilleran, and 20% wide-ranging.

The rarest of these plants are the eleven endemic species and subspecies which Calder and Taylor first discovered, and which at that time were not known from anywhere else. These eleven plants are: Queen Charlotte Isopyrum *(Isopyrum savilei),* Newcombe's ragwort *(Senecio newcombei),* Taylor's saxifrage *(Saxifraga taylori),* Queen Charlotte avens *(Geum schofieldii),* Tasu reed grass *(Calamagrostis purpurascens* ssp. *tasuensis),* Crinkle-haired mountain heather *(Cassiope lycopodioides* ssp. *cristapilosa),* Queen Charlotte violet *(Viola biflora* ssp. *carlottae),* Yellow alp lily *(Lloydia serotina* ssp. *flava),* Smooth-fruited alpine willow *(Salix Reticulata* ssp. *glabellicarpa),* Island laousewort *(Pedicularis pennellii* ssp. *insularis)* and Haida monkeyflower *(Mimulus guttatus* ssp. *haidensis).* Recently some of these have been discovered on the west coast of Vancouver Island. These eleven species and subspecies represent 2.3% of the native flora and 9% of the mountain flora, which is a high number of endemics for a northern region.

In the summer of 1980 we found seven more plant species in the mountains on the west coast of Graham Island not previously recorded from the Queen Charlotte Islands. We attempted to derive a comparative measure of floristic richness for each of the localities visited, and to compare this with Calder and Taylor's plant geographic analysis. There are about 90 rare alpine, endemic and disjunct species on the Islands. Disjunct species are those which occur in restricted areas widely separated from the rest of of their ranges. On the Queen Charlottes most of he disjuncts occur in only one or two localities although they are often common alpine species in the more continental mountain ranges of the mainland.

Some examples of these are: monkshood *(Aconitum delphiniiforium),* Arctic mugwort *(Artemisia arctica),* Alpine fireweed *(Epilobium latifolium),* Artic fleabane *(Erigeron humilis),* Northern anemone *(Anemone parviflora),* Cliff anemone *(Anemone multifida),* Field locoweed *(Oxytropis monticola),* Alpine bistort *(Polygonum viviparum),* Purple saxifrage *(Saxifraga oppositifolia),* Tufted saxifrage *(Saxifraga cespitosa),* Moss campion *(Silene acaulis),* Richardson's geranium *(Geranium richardsonii),* Jacob's ladder *(Polemonium pulcherrimum),* Black-tipped ragwort *(Senecio lugens),* Alpine dandelion *(Taraxacum ceratophorum),* and Alpine meadow-rue *(Thalictrum alpinum).*

Our findings were that the greatest number of these rare species occur in the mountains on the west coast of the Charlottes, and their numbers decrease eastward. Also, there is a high concentration of the rare species on limestone mountains. For plants, the limestone provides higher nutrients, better-drained soils, and open non-forested habitats. Such conditions have favoured the survival of plants which are adapted to drier, less maritime environments. Their requirement for open habitats has prevented their spreading into the dense coastal forest and their requirement for non-acidic high-nutrient soils has restricted their extending into the extensive peatlands.

Based on the occurrence of the endemics, the disjuncts, and the distinctive distribution patterns of the rare plants, Calder and Taylor conclude that there was a non-glaciated refugium on the west side of the Queen Charlottes where these plants survived the last glaciation of the surrounding land. Following recession of the glaciers, some of these plants migrated to the eastern parts of the Islands, but there was very little migration of them to the mainland. With deglaciation there was immigration of plants to the Queen Charlottes first from the south, and then from the Beringia refugium in the north. A warm, dry climatic period known as the Hypsithermal allowed colonisation by plants not generally found under today's wet coastal conditions. Remnants of these

species have survived as the rare alpine species on the limestone mountains of the west coast.

Calder and Taylor conclude their discussion with some intriguing but unanswered questions: How widespread were the endemic species before glaciation? Are the endemics the remnants of once more-widespread plants, or did they evolve **in situ** on the Queen Charlottes? The recent discovery of some of the endemics and many of the disjuncts on the west coast of Vancouver Island and some of the adjacent smaller islands, would suggest that the endemics were previously more widespread along the outer coast. Calder and Taylor's statement that these questions will probably never be answered satisfactorily is still valid today, but futher intensive plant exploration in the remote mountains of the western Queen Charlotte Islands, western Vancouver Island and the mainland coast will help us fit a few more pieces to a fascinating puzzle.

R. T. Ogilvie
Botany Division
British Columbia Provincial Museum, Victoria, B.C. V8V 1X4

Hans L. Roemer
Ecological Reserves Unit
British Columbia Ministry of Lands, Parks and Housing
Victoria, B.C. V8W 2Y9

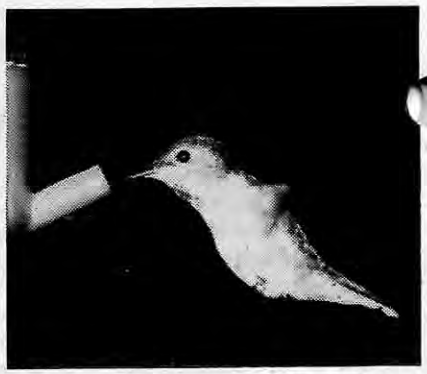


photo: Al Grass

One Drop or Two

It seems that there is no human endeavour today that does not generate debate — often acrimonious debate. Even the apparently innocent and, to some, totally humane act of feeding wild birds, is not free from conflict. And feeding hummingbirds is no exception.

There is the yes — feed 'em school, the don't feed 'em school, the feed 'em-honey school and so on, *ad nauseum.* Therefore, it is with some trepidation that I enter the lists; I do it not to take sides but to, hopefully, give you enough information to choose your own side.

As for feed 'em, don't-feed 'em: With one rather important exception, it makes no difference to the hummingbirds. Let's face it, we feed hummingbirds because we like having them around. Hummingbirds can get along quite well without us — after all, they've been doing it for thousands of years.

About that exception: In southwestern, coastal British Columbia — where winter can best be described as the wet part of summer — a few Anna's Hummingbirds do winter. Then, a diet supplemented by what they get at your feeder, may mean the difference between survival and oblivion.

As to what to feed, sugar and water, in varying proportions, has been recommended by an army of "authorities" on the subject. Most recommend three parts water to one part sugar. One suggests a mixture as rich as two to one. Another made a good case for one as lean as six to one — supported by good evidence that there were no objections from his clientele.

But sugar is a comparatively simple problem to deal with when compared with honey. Honey has the advantage — as a food — of containing proteins and minerals as well as carbohydrates; sugar, I'm told, contains only carbohydrates. The main disadvantage to honey is its propensity for fermentation in warm weather (shades of drunken hummingbirds!). Mixing the honey in water and briefly boiling the mixture, I'm told, eliminates the fermentation problem.

Another concern about honey as food for hummingbirds seems to have now been put to rest. That is that honey produces a fungus in the throats of the birds that drink a mixture containing it. This is now believed to be a problem only in the tropics where continuous high temperatures seem to be the environment in which the trouble develops.

So, if you're satisfied that honey is not harmful, use it; a mixture similar to that for sugar does the trick.

Then there's that question about red, food colouring. Hummingbirds are attracted to red; they like red flowers, and red feathers. Therefore a little red around your feeder — be it a red dye in the mixture or a red ribbon around the feeder — seems to get the attention of the birds. Once they've found the food, they're indifferent to its colour. But the concern about the carcinogenic effects of red food dyes remain so, if you share these concerns, don't use these dyes. If you do use them, a drop or two is enough.

The feeder itself may be something as a test tube with a rubber stopper, and a piece of bent, glass tubing through the stopper, or as complicated as some multi-chambered commercial models. If you're handy, make your own; if you're affluent, buy one.

Where you put your feeder doesn't seem to matter; a friend of mine had one hanging in his *open* kitchen window. He often had as many hummers *in* the house as he had outside. The usual place, because you've put the feeder out to *se* the birds, is near a window, hanging from an eave. Just make sure that, wherever you put it, it's out of range of cats.

Put your feeder out as early as possible in the spring (note previous exception). If freezing becomes a problem, hang a lighted electric bulb near the feeder. The bulb does not deter the birds and its heat keeps the mixture drinkable. Hummingbirds are usually long gone by September in most parts of British Columbia. But sometimes a feeder out later may snag a straggler. While is might be nice to have such tardy chaps around, the presence of your feeder might be disastrous for the bird. It might decide to stay and, even with your offerings, British Columbia in winter — for the most part — is no place for hummingbirds.

But all this debate of about feeding hummingbirds can be put to rest easily: let your feeder be a plant. A garden with a profusion of one or more of the following plants will be just as attractive to hummingbirds as one with an artificial feeder. My favourite is nasturtium but scarlet runner, columbine, fuschia, moring glory and scarlet sag have all been recommended.

Good hummingbirding!

Harold Hosford,
B.C. Provincial Museum

Project Reports

Progress Report on West Kootenay Naturalists' Kokanee Project financed by a $1,000 Grant from the Outdoor Recreation Division of B.C. Parks Department

Supported by the staff of our local Parks Division, the West Kootenay Naturalists submitted an application to the Minister of Lands, Parks and Housing for $1,233 to open a sales counter at the Visitors' Centre at Kokanee Creek Provincial Park twelve miles east of Nelson. Our application was submitted in February, 1983, and we envisaged a stock of natural history books, field guides, maps, souvenirs and related objects. At the same time we applied for the summer services of two student helpers to act as sales attendants and general assistants to the Park interpreters at the Visitors' Centre.

Our application for funds was successful to the extent of $1,000 but the request for student attendants was turned down. The criteria governing the grant permitted the West Kootenay Naturalists to make $1,000 over and above expenses after which any profits were to go for "materials mutually agreeable to the Association and the Regional Director of the Parks and Outdoor Recreation Division."

Since the Visitors' Centre in 1983 was only open daily during the months of July and August, we procured a business licence for those two months and decided to invest in a small stock of books and maps. Souvenirs, postcards and slides were ruled out for this experimental year since, with no specific sales attendants available, we thought the 7% sales tax would require to much bookkeeping and work for the busy Parks staff.

Two of our members created an attractive colouring/activity book for children containing simple drawings of flowers, birds and animals seen in the Park. This proved to be a "best-seller". Over 80 were sold at $1.50 each, a profit of about $1.00 per book.

Our local bookstore in Nelson did all the ordering for us, covering freight and allowing us a 20% discount. This was a better arrangement than we could make with the wholesalers. Star charts and "My First Book about Space" were popular children's items, and a selection of the Provincial Museum handbooks sold out.

We sold about $555 of merchandise, and finished the short season with a bank balance of $778.70, stock with a retail value of $302.55. Our club received a donation of $200 from the profits, we have capital to finance a second year of operation, and with experience gained this year, we hope to do even better in 1984.

Some may ask, "Why don't our members staff the sales counter themselves?" Our answer is that our membership of 120-130 is spread over the whole of the West Kootenays, with only about 15 in the immediate Nelson district. It is not economically sensible for people to drive round trips of 60 to 150 miles to work a few hours and sell a few dollars worth of merchandise.

Cooperation from Parks Staff was very good, and they in turn want us to carry on this year, as they believe the counter was an added attraction to the Visitors' Centre. This belief was supported by comments from the visiting public, chiefly families camping in the adjacent campground.

The West Kootenay Naturalists believe that their aims of interesting people in Nature and assisting club funds were achieved, and they are prepared to carry on with a slightly extended stock in 1984.

Kokanee Project Convenors:
Vera Holliday
Betty Drew

Baynes Sound-Comox Harbour Study Area

The Comox Strathcona Natural History Society undertook a year's study, coordinated by biologist Don Trethewey, of the Canadian Wildlife Service, of the Vancouver Island coastline of Baynes Sound, the Courtenay River estuary and the Comox Harbour. Members spent one day a week in the field from October 1, 1980 to October 1, 1981. Teams were organized and each team was allocated a segment of the area to be surveyed — i.e., along the coast from Mapleguard Point to Cape Lazo. These segments were subdivided into observation sites and counts were made with the aid of binoculars and spotting scopes.

The data thus obtained has been coded by the B.C. Ministry of Environment according to season. It should be borne in mind that, as a rule, for every bird actually counted, two or more are missed. Therefore, the figures shown below, covering the area from Mapleguard Point to Gartley Point, understate the total bird population using this portion of Baynes Sound. Also, observations were made on foot from the shoreline, consequently only near-shore counts of waterfowl were possible.

Our records of the numbers of birds utilizing the balance of the study area from Millard Creek north, the Courtenay River estuary and Comox Harbour, now on file with the Canadian Wildlife Service, have not yet been coded but there is every indication that this area is richer by far, in wintering waterbirds, than the former and perhaps ranks as the most important winter sanctuary along the whole length of the east coast of Vancouver Island.

HABITAT

The diversification of the habitats in the study area provide for a wealth of avifuana — estuaries, salt marshes, flooded fields, mud flats, subtidal zones and a mixture of beach types. The densities and varieties of waterfowl are the result of these choice loafing and feeding sites while the sedges, shrubs and varied tree growth bordering the shore, provide food, shelter and nesting for land birds.

The many creeks and rivers, Rosewall Creek, Tsable River, Millard Creek, Courtenay River to name a few, that empty into the Sound and Harbour enrich the waters to such an extent that they are considered to be one of the most important waterfowl habitats in the province.

MAN'S IMPACT

Coastal environments are particularly vulnerable to man made alterations, in such areas they have a marked effect, altering, reducing and, in some cases, eliminating food supply for waterbirds. habitat destruction is insidious and it often only becomes apparent after it is too late to restore it. As well, pollution of intertidal zones and estuaries can result in great losses in both densities and varieties of marine birds.

CONCLUSION

Hundreds of thousands of birds depend on the Bayne Sound-Comox Harbour area throughout the year. Their contribution to the economy is sizeable — revenue from sports hunters, bird watchers and tourism cannot be ignored. Any decisions for commercial, industrial or residential use should only be made after all information on bird usage has been compiled. It is strongly advised

cont'd on page 20

Interior Crown Land Use Liason Committee

The third meeting of the ICLULC was held Dec. 3 1983 in Penticton. This committee was formed after a tenative meeting May 14 to discuss problems relating to allocation and development of Crown Land in central B.C. Members include representatives from the B.C. Wildlife Federation, the F.B.C.M., the Outdoor Recreation Council, the B.C. Cattleman's Association, the Sierra Club, Association of B.C. Professional Foresters and most government Ministries.

At the Dec. 3 meeting, emphasis was on the need for increased public participation in planning in view of escalating pressures on a diminishing land base.

Norm MacLeod, Public Involvement Coordinator for the Cranbrook Forest District, stressed that, while public participation was time consuming, the resulting lack of conflict made it effective.

MacLeod stated that since the Forest Service should be accountable to the general forest user, public discussion and agreement on access routes are essential. In the long run, involving the public will be cost effective: the more groups involved in the planning stage, the fewer alterations will have to be made later to accommodate one of them. The government cannot count on authoritarian enforcement and must rely on public education and self policing.

The method used by MacLeod in Cranbrook, where access roads are planned for an entire drainage and public involvement is encouraged, is being studied by other regions in B.C. MacLeod pointed out that planning must be flexible to accommodate different resources and user groups in each region. He also said that, in areas of high conflict, for example the Stein and Queen Charlottes, only a political decision may be possible.

Co-ordinated Resource Management Plans, developed to deal with problems of over-grazing, were also discussed.

It was felt that, although the over-grazing has ameliorated since there is an awareness that the ideal is a higher gradi of cattle on a better quality range, and while CRMP's provide a forum for the public to make suggestions before the final planning stages, CRMP's do have drawbacks.

CRMP's, despite their name, are actually development plans rather than management plans. They are now being used to plan in areas where range is not involved.

Although the public may comment and make suggestions in the original discussions, only commercial users of the land participate in the final decisions and we must rely on the land managers to protect our interests. Because of the diverse needs of the public for the land, this is unsatisfactory.

I.C.L.U.C. called for an independent investigation into CRMP's and a review of several specific plans to determine how they were working.

Trudy Frisk

Webs of the Spider

What housewife has not swept cobwebs off the ceiling? Who has not walked in the garden to see webs shiny with dew, or walked in the bush to encounter webs across his face? These are the more obvious signs of the presence of spiders, yet they are not that evident, since they are largely nocturnal animals.

Some webs are seen readily. But there are many not seen that easily. Who has seen the lined retreat of the trap-door spider? The snares of the dictynids and the funnel-web spiders are more evident. A knowledge of the types of webs observed will give a clue as to which family the spider belongs. One may marvel at the beauty of spider webs; but to what end does the spider produce silk, and what of the nature of this marvellous material?

The primary purpose of spider silk is the construction of a "residence" which serves as a snare to capture prey, and as a home while waiting for the insects, their primary food source. Richard Headstrom, in his book "The Spiders of the United States", suggests that spiders account for more insects than do birds! One has to examine the small snare of a dictynid to gain some idea of the numbers of insects captured by that small spider.

A keen observer will note that webs vary in shape and size. The garden spider builds a complete orb, while a tetragnatha has an "open" hub. Then there are the triangle webs of the Hyptiotes; the snare of Theridion will be a tangle of lines, while that of the Dictynids, a small tangle on the tips of weeds. The funnel-web spider builds a table from the tunnel from which she rushes to capture her prey.

Not all spiders spin webs. The Lycosids, or wolf spiders, run around on the ground in search of prey. Jumping spiders may be seen on sunny surfaces on the prowl, and you may find crab spiders loitering in flowers alert for the unwary insect. Most do produce drag lines which are used as a safety line. They are similar in strength to "Mylar", and as strong as steel wire of like diameter.

Spider silk, a protein, is produced as a liquid from the spinnerettes, that hardens on contact with the air. It will stretch one fifth of its length before breaking. There are other uses for spider silk. The male spider spins a small "sperm-web" on which he deposits sperm in preparation for mating. Spider eggs are wrapped in silk too, in a kind of sack. The size, shape and colour of these sacks will give a clue as to the family of the spider observed. In addition to webs and sacks, spiders let out long filaments in warm, rising air to "balloon", by which to travel over long distance. Spider silk has been used to manufacture cloth (a bit expensive!), and more practically, for cross-hairs in telescopic sights.

From the above, one can conclude that silk is very important in the life of the spider, and truly is one of the marvels of nature. **Walter D. Charles**

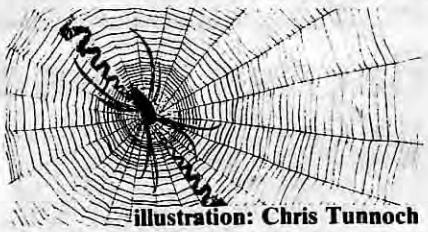


illustration: Chris Tunnoch

cont'd from page 19

that another full year's work in the field be conducted before final conclusions on developments are reached. Time consuming, but is there any pressing need to proceed with developments that once begun could irrevocably alter this coastal environment?

The following figures have been reduced by 25% to reflect an average day's count of birds from Mapleguard Point to Gartley Point.

Spring	Summer	Autumn	Winter
105,168	31,455	73,065	145,892

REFERENCES AND SOURCES OF FURTHER INFORMATION — Maps compiled by B.C. Ministry of Environment.

Report prepared by: Phil Capes for the Comox-Strathcona Natural History Society.

LUCKY LIFER

Imagine a small group hacking their way through dense brush for hours, a couple standing all morning in a cold wet marsh, another, looking rather green, clinging to the rail of a reeling boat 25 km west of Victoria. What could these people possibly have in common? Well, there's a good chance they are birders in search of the elusive "lifer"! Any experienced birder will tell you that finding a bird they've never seen is often very hard work. Ordinary people would be amazed at the time, trouble and expense to which birders will go to add a new species to their life list.

Sometimes, however, you get lucky. Such was the case for me earlier this year. On January 25, I received a phone call from Maurice Ellison of Trail. He informed me that a brown thrasher had been visiting a feeder in Beaver Falls since December 18. Beaver Falls is a small community near Fruitvale in the West Kootenays. A few days later I left my home in Nakusp and travelled to Trail where I met Maurice, Rick Howie from Kamloops, and Linda Van Damme from Nelson. We set off together to the home of George and Vera Ironmonger where the thrasher had been feeding. After the customary introductions we were provided with coffee and cake while we sat inside and waited. About an hour later, to our great excitement, the bird flew into a large fir tree near the feeder. From there the bird cautiously made its way through the branches to the end of an overhanging branch. It remained there for several minutes before making the short flight to the feeder. The bird made three trips to the feeder during the hour that we observed, all by exactly the same route. The feeder was well off the ground in the middle of a small lawn, certainly not typical thrasher habitat. Furthermore, the feeder contained seeds, not typical thrasher food!

Our thanks to the Ironmongers. It certainly was the easiest lifer I've ever seen!

Gary Davidson
Nakusp

A.G.M. at Vernon, B.C.

1984 Federation of B.C. Naturalists Annual General Meeting. Hosted by the North Okanagan Naturalists' Club at the O'Keefe Ranch Restaurant, Vernon, B.C. May 25, 26, 27, 1984.

EVENTS:

Friday, May 25:	2:00 P.M.-4:30 P.M. Discussion Period (details & location T.B.A.)
	8:00 P.M. Registration and get-together at the home of Patrick Mackie, 7804 Kidston Road, in the Coldstream.
Saturday, May 26:	6:30 A.M. Early morning birding. Details T.B.A.
	8:30 A.M.-12:00 Noon A.G.M. Meetings at O'Keefe Restaurant.
	1:30 P.M.- 4:30 P.M. N.O.N.C. Annual Field Day and Nature Trail. All visitors invited.
	7:00 P.M. Dinner: Vernon Lodge Hotel (Guest Speaker).
Sunday, May 27:	6:30 A.M. Early Morning Birding.
	9:00 A.M. - 12:00 Noon A.G.M. Meeting (continued from Sat.) O'Keefe Ranch

cont'd from page 8

fleshy roots were eaten roasted by the Californian Indians (C., C., & D.). *D. jeffreyi,* Jeffrey's Shooting Star is an altogether bigger plant. It grows in wet places in the mountains from Alaska to California and east to the Rockies. The flowers may have only four petals (*D. tetrandrum!*). The stamen filaments are very short and joined only at their bases, the anthers diverge and there is no "beak". Of two other species given in T.M.C. Taylor's checklist I can find no reference anywhere to *D. frigidum,* but *D. convergens (=hendersonii* in part) iks given in "H&C." as "east slope of the Cascades from B.C. to California and east to Alberta and Wyoming," and growing in "most moist areas from sagebrush plains to montane meadows". This species would appear to be very similar to *pulchellum* from which it can be distinguished by its very short stamen filaments (less than one mm.) and its operculate capsules — i.e., the capsule has a little lid which falls off to liberate the seeds.

ILLUSTRATIONS

A — *D. pulchellum,* whole plant with four flower stalks.
B — Ripe capsule.

REFERENCES

1. W.F.W. — *Wild Flowers of the World,* Bardara Everard and Brian D. Morley, ed. Brit. Mus. (Natural History) and Royal Botanical Gardens, Kew.
2. C., C., & D. — John J. Craighead, Frank c. Craighead and Roy J. Davis, *Field Guide to Rocky Mountain Wild Flowers.*
3. H. & C. — Hitchcock and Cronquist, *Flora of the Pacific Northwest.*
4. Henry — Joseph K. Henry, *Flora of Southern British Columbia.*
5. J.W.H. — Julia W. Henshaw, *Mountain Wild Flowers of Canada.*
6. W.C. McC. — William Copeland McCalla, *Wild Flowers of Western Canada.*
7. E.N.K. — Eugene N. Kozloff, *Plants and Animals of the Pacific Northwest.*

Joan E. Heriot

What'cha Been Doin?

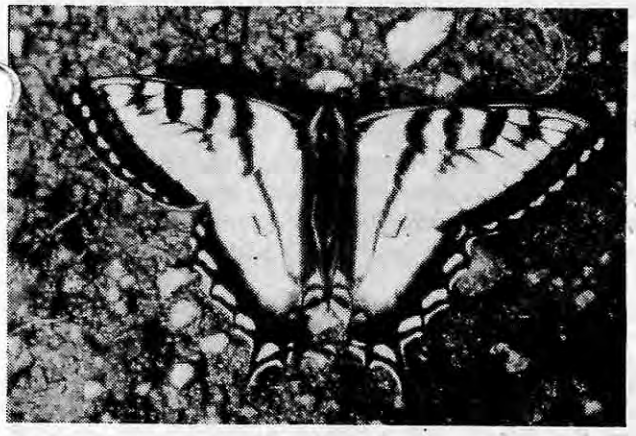
The North Shuswap Naturalist Club made use of a grant under E.B.A.P. between October 10th and December 24th, 1982. $7,679 were spent and nine people were employed to open up the area surrounding the Historic Bear Creek Log Flume which was in operation from 1908 to 1924, and to extend existing hiking trails along the Adams River within the Roderick Haig-Brown Conservation Area.

Three miles of trails, two small log foot bridges, two log motorcycle guards, and one 35' bridge were built and logs and brush in the Conservation Area were cleared and burned.

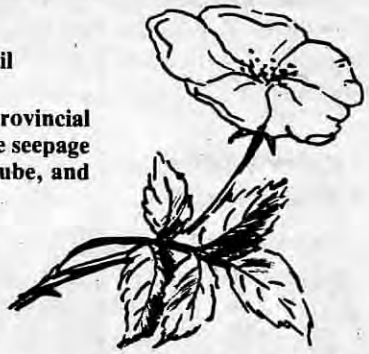
The Club received support and advice from Bill Thompson of the B.C. Forest Service, and Phil Rathbone, Ministry of Lands, Parks and Housing. While the club said it had its share of problems, they were able to solve them and complete the job to everyone's satisfaction.

In the summer months, guided interpretative hikes are scheduled, from Scotch Creek Provincial Park nature house, over Bear Creek and Adams River-Haig-Brown trails. The bring countless hours of enjoyment to hundreds of summer tourists as well as local residents.

Elsie Nykyfork



Eastern Tiger Swallowtail
(Pterourus glaucus)
Photographed in Wells Gray Provincial Park sipping water at a roadside seepage area. (100 mm lens, extension tube, and flash.) Photo: Al Grass.



THE SEDGE FAMILY OF BRITISH COLUMBIA

By T. M. C. Taylor, with illustrations by R. A. With

British Columbia Provincial Museum Handbook No. 43 (1983), ISBN 0-7718-8393-5, Library Call No. QK203BT T39, page 375.

This handbook is another of a series contributed by Dr. Taylor which, as Museum Director Yorke Edwards states, lays "a firm foundation for a Flora of British Columbia which someday must be published." Its excellence is a tribute to "Tommy" who, as most naturalists in B.C. know, died as the volume went to press.

The purpose of the book is not monographic but is meant to serve as an aid in identifying sedge species native to B.C. This purpose has been achieved very well, indeed, in my view, better than by any other comparable volume. Identification is greatly aided by the distributional maps and excellent illustrations by R. A. With which accompany each species description. The common names given, will, over time, prove to be very worthwhile.

Sedges are not easily identified for, usually, complete mature specimens and a good hand lens or dissecting microscope are required. Until recently nonmenclatural problems were many. Dr. Taylor's treatment is definitive and is easily related to treatments by Arthur Cronquist and C. I. Hitchcock in "Vascular Plants of the Pacific Northwest."

Sedge species are common in B.C. In many habitats they are the principal components of the plant cover. In our province they are very important in our natural economy but all too often have been ignored because they are difficult to identify. This handbook makes their identification much easier and is to be warmly welcomed.

Bert Brink

IT'S A DIRTY JOB

Wolf predation on livestock and ungulates has always been a controversy. So in any wolf research the study of their food habits is a primary concern. The most commonly used method to determine what an animal has eaten is a check of its stomach contents. However, in the case of predators, it is certainly undesirable to kill them just to find out what is in their stomachs.

The method we use (which is easier on the wolves, but not necessarily on the Naturalists) is to analyze the stomach contents after it passes through the intestine. in other words, looking at wolf scats.

This analysis first involves collecting the scats, double bagging them and then bringing them back to the lab where they are cooked at 130°C to destroy any tapeworm eggs. Extreme caution is required when handling wolf scats to guard against the infectious *Echinoccus* tapeworm, as they cause cysts which can be fatal.

Next, the scats are washed to remove any bone, hair or feathers. The hairs are then further cleaned with organic solvents and dried. Once the hairs are dry they are laid on acetate, sandwiched between glass and placed in an oven at 120° for 15 to 20 minutes. After heating, the hairs are removed leaving their scale impressions in the acetate. The impressions can then be examined under a microscope.

Since each mammal species has its own particular hair scale pattern, it is easy to determine what the wolf ate by matching the unknown scale pattern with a known hair reference collection. From wolf scats found in our Northwest National Parks, a list of 28 different mammals have been identified. The prey list includes: elk, moose, deer, big horn sheep, mountain goats, coyote, grizzly, black bear, domestic cow, horse and numerous smaller animals.

Who says a Naturalist's job isn't dirty work?

Written by Larry Halverson
Park Naturalist
Kootenay National Park
Sketch by Pat Dunn
Park Naturalist
Kootenay National Park

Up and coming

MAY

May 6-12 — **National Forest Week** — sponsored by the Canadian Forestry Association of B.C., 410-1200 West Pender St., Vancouver, V6E 2S9.

May 7 — **F.B.C.N. Director's Meeting,** 6:15 p.m. 1200 Hornby St., Vancouver.

May 10 — **Tynehead Zoological Garden Society and Simon Fraser University** present Dr. Jane Goodall, known for her work with primates, at the Hotel Vancouver, 8:00 p.m. Cost $10.00 each.

May 25-27 — **F.B.C.N. Annual General Meeting at Vernon.**

JUNE

June 3-9 — **Environment Week** — sponsored by Environment Canada. Contact your local office for details.

June 23-24 — **First Annual Manning Park Bird Blitz.** Contact: Gail Ross, Park Naturalist, Cultus Lake Provincial Park, Box 10, Cultus Lake, B.C. V0X 1H0. Phone: 858-7161 (ofc).

JULY

July 3-7 — **Canadian Nature Federation Annual Meeting,** U.B.C. Vancouver. For details write the F.B.C.N. office.

July 15 — Deadline for the Fall-September 1984 B.C. Naturalist.

July 16-22 — **American Birding Association Annual Meeting** in Richmond, B.C.

July 16-19 — **Western Association of Fish and Wildlife Agencies Annual Conference in Victoria.** Contact: R. J. Walker, Fish and Wildlife Branch, Ministry of Environment, Parliament Buildings, Victoria. 387-1493.

AUGUST

August 7-11 — **National Marine Education Association 14th Annual Conference in Victoria.** Theme: The Pacific Northwest: From Canoes to Submersibles. Information from: Mary Ransberry, Conference Office, University of Victoria, Victoria, V8W 2Y2.

August 21-24 — **Queen Charlotte Island Symposium** (and field trip Aug. 24-Sept. 3). Topics will include the current state of knowledge on the physical and historic setting, biotic characteristics, and people and economics. Information from: Dr. G. G. Scudder, Dept. of Zoology, University of B.C., Vancouver, B.C. V6T 2A9.

DATES TO NOTE—More next time!

Sept. 10 — **F.B.C.N. Director's Meeting,** 6:15 p.m. Vancouver, Place T.B.A.

Oct. 5-9 — **National Association for Environmental Education**—13th Annual Conference at Banff, Alberta. Contact: NAEE, P.O. Box 400, Troy, Ohio, 45373. Theme: International Perspectives of Environmental Education.