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DECISION FACTORS IN WESTERN CANADIAN MIGRATORY BIRD MANAGEMENT

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Introduction

The Canadian Wildlife Service Migratory Birds Section exists to manage the migratory bird resources of Canada for the maximum benefit of existing and future generations of Canadians and other people having access to the resource (CWS, 1970). To comply with this policy, research is underway in western Canada to identify and assess the current and future social and economic needs, requirements and aspirations of society for the migratory bird resource. In order to employ such information effectively, decision makers within the Migratory Birds Subactivity require a thorough understanding of the structure and function of Canadian migratory bird management*.

The need for this emphasis is not new. Cain (1960) stressed the need to study the public as carefully as the resource when formulating and developing wildlife management programs. In turn, Mair (1960) called for research into the mores, motivations, and real needs of people regarding the use of wildlife resources. However, it appears

*"Migratory bird management" refers to any activity of an agency (research, operations, administration, etc.) having to do with the migratory bird resource.

that migratory bird management in Canada has continued to operate independently of social and economic guidelines. In fact, less than 12 per cent of the 494 species protected under the Migratory Birds Convention Act are game birds (CWS, 1972) and less than 3 per cent of the eligible Canadian public hunt migratory birds each year. (Calculated from Cooch, Kaiser and Wight, 1972; and Statistics Canada, 1972 - see Appendix A). Yet approximately 82 per cent of manpower and finances of the CWS Migratory Birds Section is allocated to managing game species for predominantly consumptive uses (CWS Policy and Implementation Committee, 1971).

Continuously updated social and economic data is expected to provide a basis for a reapportionment of priorities and a concomitant adjustment of program emphasis within Canadian migratory bird management programs. Accordingly, the decision processes of wildlife management agencies must be geared to accept and employ the relevant guidelines from the public. If information amassed does not satisfy the requirements of the system in which it is to be employed, its collection is merely academic. Conversely, if the system is not structured to utilize decision-inputs which it has commissioned on the basis of sound theory then it must be modified to incorporate these factors in order to meet stated goals. Wildlife managers must determine the specific uses of social and economic data vis-a-vis guiding programs and budgetary allocations.

The objective of this investigation was to assess the migratory bird management process in western Canada in terms of the stated objectives and goals of the existing wildlife management agencies and in terms of the ability of the process to incorporate and utilize

social science data as guidelines and feedback to migratory bird management.

Methods

An information questionnaire (Appendix B) was distributed to selected personnel of the major wildlife management organizations in western Canada during the summer of 1972. The sample selected initially was stratified according to three levels of authority: directional, managerial, and operational. This stratification was abandoned in the analysis due to a pooling of responses and questionnaires within organizations by the recipients. Seventy questionnaires were distributed of which 47 were pooled. Interviews were conducted with key personnel in each prairie province to encourage participation in the exercise. In total, 22 usable questionnaires were returned (Table 1).

The questionnaire was designed to obtain information on the objectives, structure and expenditures of the organization, to gather opinion on decision criteria and measures of program effectiveness, and to examine variations in perception of the organizations' role between levels of professional involvement in western Canadian migratory bird management. Examination of perceptual variation was not possible due to extensive pooling of responses between levels. Information received on structure and expenditures was limited as these questions were only sent to agency directors and in many cases were omitted from the pooled copies received. These two categories, therefore, have not been included in this analysis.

Results

Policy objectives regarding migratory bird management (Table 2) provided by the western Canadian wildlife agencies exhibit two common themes. With the exception of the Northwest Territories Administration for whom there are no policy objectives in this area, all responding agencies emphasized either the conservation of the resource, the enhancement of public use of the resource or both as the central aspects of their migratory birds policies. This confirmation of a general orientation toward providing for public use of migratory birds reinforces the viewpoint that social and economic considerations must be integrated with biological data in formulating wildlife management programs.

With regard to scope of policy, the Canadian Wildlife Service appears to have the most comprehensive objectives in this area. The province of British Columbia phrased their migratory bird objectives in the context of their objectives for all wildlife groups. In contrast, the province of Alberta was the only respondent who chose to interpret "migratory birds" as only waterfowl.

Decision criteria (Table 3) actually used differed widely among respondents. This may be due partially to both actual and perceived availability of data. For example, data on breeding habitat status and staging habitat status were listed as either "actually used" or "necessary, available but not used" by the Canadian Wildlife Service-Head Office, the Province of Manitoba, and Ducks Unlimited (Canada). These same two parameters were listed by the Canadian Wildlife Service-Western Region and the Provinces of Alberta and British Columbia as necessary but not available. If indeed these factors are actually

used by the former group and are considered to be necessary by the latter group how is it that they are unavailable to the latter?

The contrast between the Canadian Wildlife Service-Head Office and Canadian Wildlife Service-Western Region with regard to the necessity of social and economic demands as decision criteria is noteworthy. This may be attributable to variation in perception of the organizations role due to widely differing functional vantage points.

It is of greater interest that the criteria of "gut feeling" and "tradition" were noted as actually used for decision making by all responding agencies with the singular exception of Ducks Unlimited (Canada).

General evaluation of migratory bird program success (Table 4) appears to be both vague and inconsistent among responding wildlife agencies. The Province of British Columbia, the Northwest Territories Administration, and the Canadian Wildlife Service admitted to having no evaluation program per se. Canadian Wildlife Service directorial response alluded to the generally subjective nature of evaluating success in conservation programs. Responding public agencies generally seemed to favour a measure of bird population status and some form of index of recreational participation and satisfaction in measuring program success. These stated uses emphasize the urgent requirement for systems to integrate biological and social data in wildlife management decision making.

Preferences for potential measures of program effectiveness (Table 5) were mixed. Several correspondents correctly noted that the items presented could be used to measure a variety of differing phenomena and, therefore, could not be equated directly. Ducks Unlimited (Canada)

pointed out that all items presented are used by them in a general way but that none is used specifically to evaluate a program. This probably is the case for many of the public agencies as well. The Canadian Wildlife Service indicated here that they require policy guidelines which would enable CWS inputs to basically recreation oriented, provincially managed migratory bird projects. It follows that a consistent formula for measuring program effectiveness would be forthcoming with such developing policy.

Comments listed (Table 6) provide an indication of the general views of selected respondents regarding the survey at hand and the areas of decision making and program evaluation in migratory bird management. These views are generally positive and optimistic. The decision criteria and measures of effectiveness considered in this exercise by no means represent a complete list of potential wildlife management decision factors. However, this preliminary exercise has provided an indication of current levels of sophistication prevailing in migratory bird management decision making in western Canada. What remains is to identify an optimal system for the integration of management information as a prerequisite to the development of both an objective evaluation system and an objective decision making process.

References

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Table 1

Summary of distribution and responses to Canadian Wildlife Service migratory bird management questionnaire

Institution	Distribution			Returns				
	Direc- torial ¹	Mana- gerial ¹	Opera- tional ¹	Pooled ²	Not pooled ³			
Canadian Wildlife Service	3	6	3	5 → 1	4			
Alberta Fish and Wildlife Division	1	1	6	8 → 1	0			
British Columbia Fish and Wildlife Branch	2	1	6	4 → 1	3			
Manitoba Wildlife Programs	1	2	8	9 → 0	2			
Saskatchewan Fisheries and Wildlife Branch	1	2	2	4 → 0	1			
Northwest Territories Division of Wildlife Management	1	0	5	6 → 1	0			
Yukon Territory Game Department	1	0	5	6 → 0	0			
Ducks Unlimited (Canada)	1	1	7	2 → 1	6			
Delta Waterfowl Research Station	1	1	1	3 → 1	0			
Creston Valley Wildlife Management Area	0	0	1	0	0			
Total	12	+	14	+	44 = 70	6	+	16 = 22

¹Level of recipient.

²Questionnaires passed on to a single individual within the institution.

³Questionnaires completed individually.

Table 2.

Policy objectives of western Canadian migratory bird management agencies. The policy objectives of my agency regarding the management of the migratory bird resource are:

Responses By Agency

Alberta

- (1) To maintain waterfowl populations at a high level by (a) ensuring sufficient waterfowl habitat for all species through an inter-agency approach; (b) managing all waterfowl populations.
- (2) To maintain or improve the present waterfowl hunting in the province by (a) dispersing hunters in order to reduce access problems, equalize hunter success and improve the recreation; (b) provide sufficient areas for hunting and viewing of waterfowl in close proximity to urban areas, either free of charge, or through a uniform charging of access on private or crown lands. The acquisition of hunting areas should be discouraged especially with nonresidents, by limiting the length of their huntings; (c) providing sufficient protection to all species to prevent harassment and subsequent deleterious changes in migration patterns; (d) attempt to improve the status of waterfowl hunting by promoting and/or legislating ethics in hunting.
- (3) To reduce the waterfowl damage of crops to a minimum by a combination of flexible seasons, lure crops and payments for crop loss in cooperation with the federal government.
- (4) To assist in waterfowl populations and harvest surveys with other government agencies in order to be (a) familiar with the available waterfowl data in the province; (b) to implement changes in surveys in order to obtain additional information for changes in season regulations; (c) eventual knowledge of population levels of waterfowl in provincial respect to existing habitat/limiting factors and demands of future hunting.

British Columbia

- (1) To protect wildlife resources.
- (2) To manage wildlife in response to public need and demand, within the capacity of the resource to sustain such needs and demands.
- (3) To inform and educate the public about wildlife resources and their management.
- (4) To seed understanding about wildlife resources through the conduct of research.

Table 2 (Continued)

Canadian Wildlife Service

A fundamental aim of the Canadian Wildlife Service is to manage the migratory bird resource for the maximum benefit of existing and future generations of Canadians and other people having access to the resource.

Priority Group No. 1

- (1) To determine and to assess the current and future social and economic needs, requirements and aspirations of society for the migratory bird resource.
- (2) To conserve rare and endangered species of migratory birds.
- (3) To encourage and to provide for the non-consumptive recreational use of all species of migratory birds.
- (4) To ensure high production and optimum consumptive use of the migratory game resource.

Priority Group No. 2

- (5) To ensure that the legitimate and traditional uses of migratory birds by Canada's indigenous peoples and others in need of the resource are met within the capability of the resource to support such a harvest.
- (6) To assist in preserving and maintaining environmental quality by using migratory birds as monitor species.
- (7) To interpret to the public the ecological role of migratory birds.
- (8) To promote research and investigation on migratory birds and on their environments which will contribute to man's understanding through the elucidation of biological and ecological phenomena and concepts.

Priority Group No. 3

- (9) To ameliorate and to diminish effects of birds which are detrimental to society.
- (10) To determine major causes of waste of the migratory bird resource, whether natural or artificial, and to seek and apply ways and means of preventing, reducing or eliminating that waste.
- (11) To support the training and education of professional and technical persons in the field of migratory bird research, management and interpretation.

Table 2 (Concluded)

Delta Waterfowl Research Station

(1) The discovery of information helpful in understanding and enhancing waterfowl populations and their habitat.

(2) Provision of facilities for training students at the graduate level.

Ducks Unlimited

The development and preservation of waterfowl breeding habitat in Canada.

Manitoba

To provide the people of Manitoba with use of migratory birds at satisfactory levels of enjoyment.

Northwest Territories

"We haven't any policy objectives - none at all."

Saskatchewan

No information provided.

Yukon Territory

No information provided.

Table 3

Decision criteria employed by western migratory bird management agencies.*
Please indicate which of the categories listed below are used by your agency for making decisions about migratory bird programs such as: program selection, project priorities, management emphases, enforcement needs, information needs, land acquisition, regulations, etc.

Criteria	Actually used	Neces- sary, avail- able but not used	Neces- sary, but not avail- able	Not neces- sary
Gut feeling	A, M, CH, CH, B, CW(6)			
Tradition	A, M, B, N, CH, CW(6)			
Last season's hunter population	M, B, D, CH, CW(5)			
Political pressures	M, B, N, CW(4)			
Breeding population status	A, M, D, CH(4)	A	B, CW	
Last year's harvest	A, B, D, CH(4)	CW	M	
Last season's limit	M, B, D, CH(4)	CW		
Last season's length	M, B, D, CH(4)	CW		
Phenology of current season	B, D, CH(3)	CW		M
Potential for crop depredation	A, D, CH(3)		M, B, CW	
Breeding habitat status	M, D, CH(3)		B, A, CW	
Last year's age ratio	D, CH(2)	B, CW	M	
Meteorological trends	D, CH(2)	B, CW		M
Current season brood success	CH, D(2)	M	B, A, CW	
Staging habitat status	D, CH(2)	M	B, A, CW	
Social demand	B, N(2)		M, D, CW	CH
Economic demand	B, N(2)		M, D, CW	CH
Other: (specify):				
Personnel available	CW			
Funds available	CW			
Demand for special licenses	CW			
Rate of law of infractions detected	CW			

Legend:

A = Alberta

B = British Columbia

CH = CWS, Head Office

CW = CWS, Western Region

D = Ducks Unlimited

M = Manitoba

N = Northwest Territories

*Managerial and managerial pooled responses only.

Table 4

Measures of program effectiveness employed by western migratory bird management agencies. How does your organization evaluate the success of its migratory bird management program?

Responses By Agency

Alberta

In relation to:

- (1) Migratory bird population status.
- (2) Control and compensation of migratory bird damage.
- (3) Availability of birds to sportsmen. (Managerial pooled.)*

British Columbia

- (1) We have no program of evaluation as such to date, however, public acceptance or rejection has been used where there has been a decided trend. For refuge projects now proposed we intend to monitor man-days of recreation, etc., as a means of evaluating success. Several reports prepared by economic consultants for our Branch have indicated consumer values. (Managerial pooled.)
- (2) No concrete program - trends in harvest, success and people participation are noted; changes in habitat (both favourable and unfavourable) are recorded periodically. (Operational.)

Canadian Wildlife Service

- (1) "Not measured". (Managerial.)
- (2) Evaluation at present depends upon the degree to which in the judgment of managers, social demands are met, resource conflicts minimized, cost effectiveness improved. (Directoral.)
- (3) (Non-game birds only.) At present we are trying to develop and extend methods for monitoring population levels, with statistical treatments suitable for the type of data collected. Success of the program at present is measured largely by the area covered by our surveys and the number of species for which representative data can be secured. The existence of the program is good P.R., but at its present stage it is probably unrealistic to expect objective evaluation techniques. (Operational.)
- (4) Maintenance of breeding population and distribution of quality hunting. (Operational.)

Table 4 (Continued)

Canadian Wildlife Service
(continued)

(5) Size of harvest and its distribution measured against forecast; number of complaints or compliments received; actual size of breeding population and distribution in relation to targets set. (Pooled directoral.)

Delta Waterfowl Research Station

Number of birds returning to breeding area . . . survivorship of released hand-reared and trapped wild birds. (Directoral.)

Ducks Unlimited

(1) By on-site inspection of project effectiveness at intervals after the fact. (Operational.)

(2) By the product realized. By the use of the areas developed during years of drought. Use of developed areas during migration. (Operational.)

(3) By the numbers of acres and miles of shoreline of wetlands created or improved; by the number of dollars spent; by the ratio of overhead to habitat management and production costs. (Operational.)

(4) Very indirectly - in terms of wetland acreage brought under control, on management and/or miles of shoreline. (Operational.)

(5) Quantity and quality of waterfowl breeding habitat developed and preserved. (Operational.)

(6) In terms of the amount of habitat - acres and miles of shoreline - developed. (Managerial.)

Manitoba

(1) Status of breeding population in following year. Birds bagged per hunter trip. Hours spent on waterfowl hunting, watching, etc. (Operational.)

(2) To the best of my knowledge we do not, with the exception of specific populations. (Operational.)

Northwest Territories

"Nil". (Operational.)

Saskatchewan

No information provided.

Table 4 (Concluded)

Yukon Territory

No information provided.

* Level of respondent.

Table 5

Measures of program effectiveness employed by Western Migratory Bird Management agencies. Potential measures of program effectiveness

Measure	No. of Agencies Using or Preferring	Identity Code ¹
Birds bagged	7	A,B,CH,CI,D,M,Delta
Man-days of recreation	6	A,B,CH,CI,D,M
Birds encountered (numbers)	6	B,CH,CI,D,M,Delta
Birds Encountered (variety)	5	B,CH,CW,D,Delta
Satisfaction derived	5	A,B,CW,D,M
Biotic diversity preserved	5	B,CH,CW,D,M
Social demand fulfilled	5	A,B,CW,D,M
Threat reduced	5	A,B,CW,D,M
Scientific utility	3	B,CH,D
Income realized	2	CW,M
Food obtained (% of annual larder)	2	CW,M
Money saved (to tax payer, Insurance companies, etc.)	2	B,CW
Gene pool perpetuated	2	B,CW
Comfort sacrificed	1	D
Other:		
Cooperative development with industry	1	B.C.
Public education benefit	1	B.C.
Quantity of wetlands	1	D.U.
Maintain breeding populations	1	CH
Population characteristics maintained	1	CH
Opportunity cost of time ²	NA	2
Energy expended ²	NA	2
Dollars invested ²	NA	2
Value of associated equipment ²	NA	2

¹See Table 3.

²Ambiguously interpreted by respondents.

Table 6

Comments

Alberta Managerial

A provincial waterfowl policy must consider the resource in both an international and interprovincial manner. Recognition of the Federal Government's role of preserving all migratory species and as the main agent in international agreements on the proportion of the waterfowl resource in respective areas is essential. Recognition of this by the Federal and Provincial Governments however, means that the Federal Government is partially responsible for retention of waterfowl habitat and waterfowl damage to agricultural crops. The Provincial role in addition to habitat retention, development and crop losses, is in the management of hunters; both in limiting the provincial kill and in maintaining or improving the recreation from waterfowl by dispersing hunters and providing sufficient areas for hunting and other related pursuits.

British Columbia Operational

A. Rightly or wrongly waterfowl have had to take a very low position of priority in Okanagan Region Management Work. This was dictated by several reasons: (a) the Okanagan is not a great waterfowl producer (relatively) and consumptive use is low; (b) pressure of problems with other species has forced our attention away from waterfowl; (c) I have been very pleased to leave waterfowl to the CWS.

B. The results of your analysis could provide an excellent base line for structuring a firm waterfowl management program for this region and this province - hurry!

CWS Managerial (HO)¹

My answers to this questionnaire would tend to indicate that socio-economic factors are at present ignored. This is largely true. The Migratory Birds Convention Act does not give authority to deal with people only with birds. Some seasons are set for traditional opening and closing but all are set in relation to manipulating avian populations. Our legal advisor has told us that the Migratory Birds Convention Act is for the birds and not the people.

CWS Operational (HO)

I have no direct responsibility to the population but use the data to prepare population models and predictions on which others base their decisions. My job is successful when I can successfully square the frames on which the models are built.

Table 6 (Concluded)

CWS Directorial (WR)

This is a useful and interesting questionnaire and shows how far we have to travel before our activities become entirely rational.

Ducks Unlimited
Managerial

A. With reference to habitat perhaps there should be more specific information available as to what is happening to the habitat. The preservation of habitat should and can be compatible with other land use practices, e.g., 1. watershed development; 2. removing sub-marginal lands from cereal crop production and establishing hay crops, etc.; 3. restrictions on certain land clearing or filling practices, especially when they will contribute to soil and wind erosion.

B. ...there exists a definite need for a stepped up land acquisition program to ensure the future of those remaining key areas that ultimately will be lost to other uses.

Ducks Unlimited
Operational

I commend the idea of a questionnaire to determine factors governing existing migratory bird management. I feel many organizations manage migratory birds through consideration of existing or needed habitat of all types, and this questionnaire could place more emphasis on this aspect.

Manitoba Operational

The Manitoba provincial government in the past and presently believes that migratory birds and all the inputs (whether management or research) should be a federal government responsibility.

Northwest Territories
Operational

...migratory birds are of very low priority.

Saskatchewan Operational

Policy objectives and decisions are made in Regina after input from ecologists. Fortunately since habitat still exists in fairly good quantities the birds manage to make up for human failings.

¹Affiliation and level of respondent.

Appendix 1 Supportive Calculation

a) 1971 Total Canadian Population	21,568,311.00
b) Ages: 0-4	1,816,155.00
c) 5-9	2,254,055.00
d) 10-14	2,310,738.00
e) 15-19	2,114,346.00
f) $e/5 = \text{Age } 15$	422,869.00
g) $b + c + d + f = \text{Ages } 0-15$	6,803,767.00
h) $a-g = \text{Canadian pop. Ages } 16+$	14,764,544.00
i) Canadian resident migratory bird hunting permits (1971)	395,622.00
j) $i/h \times 100\%$	2.67%

Sources:

a,b,c,d,e

Statistics Canada, 1972.

i

Cooch, Kaiser and Wight, 1972

MIGRATORY BIRD MANAGEMENT
PRELIMINARY INFORMATION QUESTIONNAIRE

1. Name of agency (organization): _____

2. Level of organization: _____ federal
 _____ provincial
 _____ territorial
 _____ regional
 _____ municipal
 _____ private
 _____ other (please specify):

3. Name of official completing questionnaire:

4. Title of official completing questionnaire:

5. The policy objectives of my agency regarding the management of the migratory bird resource are:

(Question 6, Migratory bird management structure and Question 7, Migratory bird management inputs (costs) will be presented to agency directors only.)

6. Migratory bird management structure.

Please construct an organizational chart including all units and personnel in your agency involved in migratory bird management (operations, research, administration, etc.) and indicate their staff and line interactions.

8. Decision criteria.

Please indicate which of the categories listed below are used by your agency for making decisions about migratory bird programs such as: program selection, project priorities, management emphases, enforcement needs, information needs, land acquisition, regulations, etc.

Criteria	Actually used	Necessary, available but not used	Necessary, but not available
Breeding population status			
Current season brood success			
Breeding habitat status			
Staging habitat status			
Last season's hunter population			
Last season's limit			
Last season's length			
Gut feeling			
Last year's harvest			
Last year's age ratio			
Social demand			
Economic demand			
Phenology of current season			
Meteorological trends			
Potential for crop depredation			
Political pressures			
Tradition			
Other (specify):			

9. Measures of program effectiveness (outputs, benefits).

(a) How does your organization evaluate the success of its migratory bird management program?

(b) Listed below are some potential measures of migratory birds management program effectiveness. Please check those which your organization actually employs and give an example of a program evaluated by the measure in question. Please rank your preference for any of the measures presented (with number 1 indicating the most preferred item).

Measures of effectiveness	Check if used	Example of program	Rank preference
Man-days of recreation			
Birds bagged			
Birds encountered (variety)			
Birds encountered (numbers)			
Food obtained (% of annual larder)			
Income realized			
\$ invested (% of discretionary income)			
Value of associated equipment			
Satisfaction derived			
Comfort sacrificed			
Energy expended			
Opportunity cost of time			
Scientific utility			
Biotic diversity preserved			
Gene pool perpetuated			
Threat reduced			
Money saved (to taxpayer, insurance co.)			
Social demand fulfilled			
Other (specify):			

