ECONOMIC AND SOCIAL VALUES

OF

MIGRATORY BIRDS

N.S.

A STUDY PROPOSAL

SUBMITTED TO

CANADIAN WILDLIFE SERVICE

BY

INSTITUTE FOR NORTHERN STUDIES

UNIVERSITY OF SASKATCHEWAN

C O N T E N T S

INSTITUTE FOR NORTHERN STUDIES

University of Saskatchewan
(Saskatoon)

MINUTES OF MEETING WITH CANADIAN WILDLIFE SERVICE

On Thursday, October 22, 1970, starting at 2:30 p.m., a meeting was held in the Conference Room, General Purpose Building, sponsored by the Institute for Northern Studies, to provide an opportunity for W. J. Doug Stephen for amplication of a research proposal entitled ECONOMIC AND SOCIAL VALUES OF MIGRATORY BIRDS.

The following persons were present: W. J. D. Stephen (representing Canadian Wildlife Service, Department of Indiam Affairs and Northern Development, Edmonton), W. O. Kupsch (Chairman, representing Institute for Northern Studies), Mrs. Phyllis Smith (secretary, Institute for Northern Studies), E. J. Abramson (Sociology), W. Barr (Geography), J. Bergsteinsson (Geography), D. A. Blood (Saskatchewan Department of Natural Resources), R. M. Bone (Geography), R. T. Coupland (Plant Ecology, Matador Project), E. A. Driver (Canadian Wildlife Service, Saskatoon), A. Dzubin (Canadian Wildlife Service, Saskatoon), M. Epstein (Commerce), B. Gollop (Canadian Wildlife Service, Saskatoon), B. Holmlund (Computational Science), L. Kristjanson (Economics and Political Science), G. E. Lee (Agricultural Economics), J. G. McConnell (Geography), J. F. V. Millar (Anthropology and Archaeology), R. Murray (Canadian Wildlife Service, Saskatoon), H. R. Nixon (Physical Education), R. L. Randell

(Biology), J. S. Rowe (Plant Ecology), D. Schmeiser (Law), E. N. Shannon (Geography), G. Storey (Agricultural Economics), J. A. Wedgewood (Director of Planning, University of Saskatchewan).

W. J. D. Stephen started to bring the research proposal before the audience by providing some background about Canadian Wildlife Service. The CWS is primarily a scientific organization and about 90 percent of the scientists are biologists. A lack is felt in expertise in the social sciences and the art of management. One of the obligations of CWS is the management of migratory birds, an important national natural resource.

The problem that CWS wants to investigate with the help of experts not at present within their organization is "to determine and assess the current and future social and economic needs, requirements, and aspirations of society for the migratory bird resource".

Doug Stephen then went on to elaborate on the need of CWS to have this problem investigated in detail. More information about all aspects of the migratory bird resource is needed for management decisions such as the allocation of funds between various options open to CWS and the drafting of new or revised regulations and legislation.

Migratory birds present a particularly difficult management problem because one has to deal with a "movable resource" the use of which is nation-wide. The economic values placed on ducks, for instance, by the indigenous peoples of northern Canada differ from those by the farmers of Saskatchewan or the hunters in Louisiana.

Moreover, not only economic values are involved. Social values and legal rights and obligations, national as well as international, have to be taken into account. That the problem is not simply economic is demonstrated by the existence of residual rights to any migrating water fowl along its flypath by Canadians resident outside the migration route. Simple economics theory based on the pricing system generally does not take such matters, or others such as aesthetic or recreational values, into account.

Some studies undertaken in the United States by graduate students for their Ph.D. degrees were mentioned. These provide some background for the study which CWS has in mind. All have their limitations mainly in that they do not consider social values and in that they do not recognize the time preference of conservationists by taking 50 years maximum amortization of present monetary value. Their greatest drawback is a disciplinary bias built into these studies. None are truly multidisciplinary let alone inter-disciplinary. The study to be undertaken for CWS should avoid such narrow views of the problem.

Besides the obvious economic values of migratory birds, such as their "country food" value to the indigenous people or the price put on a bird by a hunter, several social values were mentioned: recreational, therapeutic, artistic, educational, ecological, political, and legal.

After the above general review of the problem some available information of use in the study was mentioned. For instance,

CWS can provide data based on the sale of hunting licenses. But for much of the needed input special data gathering will have to be devised. The research project is to lead preferably to a quantitative model. Similar studies elsewhere have been confined to restricted areas, such as the site systems study of San Francisco Bay. The proposed study differs from previous studies in scale in that it has to take all of Canada into account. To the best of his knowledge Dr. Stephen did not think that such a study, comprising both economic and social values of a national resource, has yet been undertaken anywhere.

Summarizing, what CWS wants is to determine if interest for involvement in the study exists at the University of Saskatchewan. If such interest is apparent CWS will need an expression of a willingness to negotiate by November 17, 1970. Such an indication should include a timetable and budget requests for the first stage in the three stage project:

1. Definition of problem. Deadline March 31, 1971.
2. Design of project for collection of information.
3. Collection, analysis, conclusion, and description of weighted interactions of system.

After the above review was presented considerable discussion followed. From this it became clear that although a study of, say, deer would be less complex, the proposal calls for the study of migratory birds. The money available to CWS for multidisciplinary research is tied to this resource. As far as financial

support for the study is concerned an amount of $25,000 per year was mentioned as easily obtainable with the possibility for negotiation for a higher amount if warranted. The duration of the study is also open to negotiation but at least two years was mentioned. It was felt by some that this time span is unrealistic and that at least five years would be needed to obtain meaningful results. CWS likes to bring this project to Saskatoon on account of their station on the campus where work on migratory birds is already in progress. The university-based project will keep in close contact with the scientists at the CWS Saskatoon station, and any Steering Committee should include someone from the station. It was made clear that if there is no interest for the project at the University of Saskatchewan CWS will approach other universities in western Canada for help. The project should lead toward a model that takes into account more than dollar value alone and should be amenable to change in time when more or emended data become available.

The meeting ended with the assurance given by the Chairman that the proposal presented by CWS would be given further consideration and that he would contact 1) those persons present at the meeting who expressed a willingness to sit on an ad hoc Steering Committee, 2) the administrative officers in charge of research in the University. Further actions by the Chairman in this respect are recorded on the attached mimeographed sheet.

CWS PROJECT

ECONOMIC AND SOCIAL VALUES
OF MIGRATORY BIRDS

Following the meeting of October 22, I was in contact either personally or by telephone with the following persons on the Steering Committee:

E. Abramson (Sociology)
R. M. Bone (Geography)
J. B. Gollop (Canadian Wildlife Service, Saskatoon)
L. F. Kristjanson (Economics and Political Science)
J. F. V. Millar (Anthropology and Archaeology)
J. S. Rowe (Plant Ecology)
G. Storey (Agricultural Economics)
J. A. Wedgewood (Planning)

In addition, I talked to the Principal, the Vice-President (Research), and Mr. A. Pettigrew, Business Manager. The outcome of these interviews can be summarized as follows:

1. By November 17 I will submit to Doug Stephen a letter of intent expressing the interest of the University of Saskatchewan, Saskatoon, in a contract for the project outlined by him.

2. The contract between CWS and the University of Saskatchewan will be administered through the Institute for Northern Studies which will take the responsibility for fulfilling the terms of the contract.

3. INS will engage two part-time research associates for the first phase of the project which is to start immediately after acceptance of the INS proposal by CWS, i.e. as soon as possible after November 17, 1970. This first phase will deal with the definition of

the problem. It will lead to a report describing the steps to be taken in the study, their timing, their mode of execution, and their cost. The deadline for this first phase is March 31, 1971.

PART 2

TO: D. Stephen

FROM: W. O. Kupsch

DATE: November 12, 1970

RE: ECONOMIC AND SOCIAL VALUES OF MIGRATORY BIRDS

This is to express the continuing interest by the Institute for Northern Studies (INS), University of Saskatchewan, Saskatoon, representing and co-ordinating various members of faculty, in the research project proposed by Canadian Wildlife Service (CWS) in a meeting held on October 22, 1970, in Saskatoon. Any contract regarding this project should take the following into consideration:

1. The contract will be administered through INS.
2. The responsibility for fulfilling the terms of the contract will rest with INS.
3. INS will engage one or two part-time researchers for the first phase of the project.
4. The first phase of the project will deal with the definition of the problem. It will lead to a description of the steps to be taken in the study, their timing, and their cost. A report on this first phase is to be in the hands of CWS by March 31, 1971.
5. Depending on the recommendations contained in the report on the first phase of the project further negotiations between INS and CWS may or may not be undertaken on or about April 1, 1971.

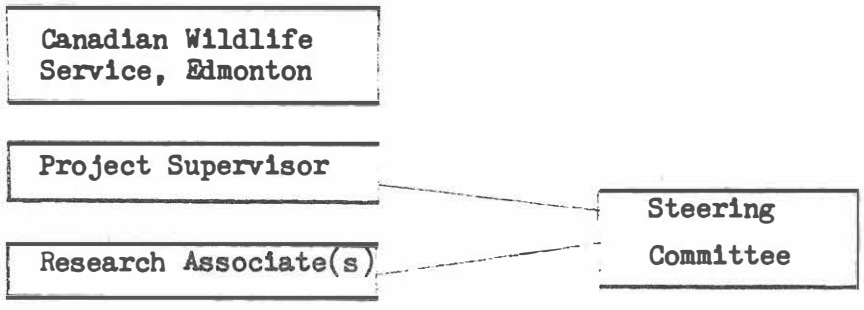
6. The budget requested for the first phase of the project, which is to cover a period of 4 months (from December 1, 1970, to March 31, 1971) is $8,000. The expected expenditures are:

$4,000.	for honoraria (2)
1,000.	for travel
1,400.	for report
1,600.	for administrative overhead 20%
$8,000.	

Full accounting of expenditures made will be submitted to CWS on March 31, 1971, with the report covering phase 1.

7. The first phase of the project will be under the general guidance of a Steering Committee, the composition of which will be submitted to you later but which will comprise at least those persons who expressed an interest to serve at the October 22 meeting. The Project Supervisor will be W. O. Kupsch (INS); one or two research associates will be appointed after acceptance of the present proposal by CWS.

8. The general organization of the research team for the first phase of the project is envisaged as follows:



9. Besides continual contact with the Project Supervisor and the Steering Committee the Research Associates will consult with other interested persons who are likely to be in a position to contribute to the study.

10. The members of the Steering Committee will not receive any remuneration for work done in connection with the project. Reimbursement for out-of-pocket expenses in connection with any travel will be made, if such may arise.

11. Honoraria are to be paid only to the Research Associate(s), who will be spending a substantial amount of time on the project, and to any person or persons the Project Supervisor requests to assist in the preparation of the report. Most likely such persons are graduate students who are to be paid according to National Research Council rates. The honorarium for one Research Associate will not exceed $2,000, which is commensurate with the stipend paid to faculty members who teach one extra class during the winter semester off campus.

W. O. Kupsch

W. O. Kupsch

PART 3

DEPARTMENT OF INDIAN AFFAIRS
AND NORTHERN DEVELOPMENT

TENDER & CONTRACT

(FOR SERVICE OR WORK
NOT EXCEEDING $5,000.00)

MINISTÈRE DES AFFAIRES INDIENNES
ET DU NORD CANADIEN

SOUMISSION ET CONTRAT

(POUR SERVICE OU TRAVAUX
JUSQU'À CONCURRENCE DE $5,000.00)

CORRESPONDENCE AND INVOICES MUST SHOW THESE NUMBERS →
NUMÉROS À INDIQUER SUR LETTRES ET FACTURES

Project – *Projet* No / *N°*

Contract – *Contrat* No / *N°* WRO 70/71-17

Enc. / *Ch. Fin*	Prog.	Vote / *Crédit*	Resp. Ctre. / *Ctre. de resp.*	Activity / *Sect. d'act.*	Financial Control / *Contrôle comptable* (1)	(2)	Line Obj. / *Art. d'exéc.*	Parl. – *N° de* Vote / *cr. parl.*	Authority – *Autorisé par*
5032	5	01	381	4540	000	C.C	0434		

GENERAL DESCRIPTION OF WORK OR SERVICE – *DESCRIPTION GÉNÉRALE DES TRAVAUX OU SERVICE*

Investigation and definition of problems associated with determining and assessing social and economic values of migratory birds.

1/We hereby offer to supply the materials and perform the work or service referred to hereunder on the covenants and agreements contained hereunder AND ON THE REVERSE SIDE HEREOF, WITHIN THE TIME SPECIFIED

Par les présentes, j'offre (nous offrons) de fournir le matériel et d'exécuter les travaux ou les services mentionnés ci-dessous, conformément aux stipulations exposées ci-dessous et AU VERSO DES PRÉSENTES, DANS LES DÉLAIS PRESCRITS

Details – *Détails*	Unit Price / *Prix Unitaire*	Total
The Institute for Northern Studies, University of Saskatchewan, Saskatoon, Saskatchewan, Contractor agrees to:		
1. Investigate and define problems in determining and assessing the current and future social and economic needs, values and aspirations of society for the migratory bird resource.		
2. Provide a written report, before March 31, 1971 to the Regional Director, Canadian Wildlife Service, 10015 - 103 Avenue, Edmonton 15, Alberta, which report will:		
(a) Recommend and describe the steps to be taken in a study to determine and assess social and economic values of migratory birds.		
(b) Describe the timing and estimated costs of the steps recommended to be taken in the study specified in 2(a) above.		
It is agreed that the term of this contract is December 1, 1970 to March 31, 1971.		
The Contractor will receive consideration from Her Majesty for services rendered under this contract, at the end of each month, upon submitting a progress report and four copies of invoices, approved by the responsible officer of the C.W.S.		
...		

The parties to this contract covenant and agree as follows:

1. The Contractor will indemnify and save harmless Her Majesty from and against all claims, demands, loss, costs, damages, actions, suits or other proceedings by whomsoever made, brought or prosecuted in any manner based upon, occasioned by or attributable to the activities of the Contractor under this contract.

2. The various works or services are to be carried out and completed to the full satisfaction of the officer signing on behalf of Her Majesty.

3. The Contractor may not assign or sublet this contract or any part thereof without the written consent of the officer signing on behalf of Her Majesty.

4. Her Majesty reserves the right to terminate this contract at any time before completion for any reason whatsoever. In the event of such termination Her Majesty will pay to the Contractor an amount that, in the opinion of the officer signing on behalf of Her Majesty, is equal to that portion of the work or service completed up to the day of termination.

5. In engaging labour for the work or service contemplated by this contract the contractor will employ as far as practicable and consistent with efficiency and economy only Canadian labour with local labour receiving preference.

6. No member of the House of Commons shall be admitted to any share or part of this contract or any benefit arising therefrom.

7. Labour Conditions attached are included in this contract.

Les parties au présent contrat s'engagent à respecter les stipulations suivantes:

1. L'entrepreneur indemnisera Sa Majesté et la mettra à couvert de toutes réclamations, mises en demeure, pertes, frais, dommages-intérêts, actions ou autres procédures, faits, intentés ou engagés de toute manière par qui que ce soit, et fondés sur, occasionnées par ou attribuables à l'activité de l'entrepreneur en vertu du présent contrat.

2. Les divers travaux ou services doivent être exécutés et terminés à l'entière satisfaction du fonctionnaire qui contresigne le présent contrat au nom de Sa Majesté.

3. L'entrepreneur ne peut céder ou sous-affermer le présent contrat ni toute partie de ce dernier sans le consentement écrit du fonctionnaire qui signe au nom de Sa Majesté.

4. Sa Majesté se réserve le droit de résilier le présent contrat en tout temps avant le parachèvement de son exécution pour toute raison que ce soit. En cas de résiliation, Sa Majesté versera à l'entrepreneur un montant qui, selon l'avis du fonctionnaire qui signe au nom de Sa Majesté, correspond aux travaux ou aux services exécutés jusqu'à la date de la résiliation.

5. En recrutant la main-d'oeuvre requise pour les travaux ou les services prévus dans le présent contrat, l'entrepreneur embauchera, dans la mesure où la chose sera possible et compte tenu de l'efficacité et de l'économie, uniquement de la main-d'oeuvre canadienne et accordera la préférence à la main-d'oeuvre locale.

6. Aucun député ne participera au présent contrat ou n'en tirera un bénéfice quelconque.

DEPARTMENT OF INDIAN AFFAIRS
AND NORTHERN DEVELOPMENT

TENDER & CONTRACT

(FOR SERVICE OR WORK
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MINISTÈRE DES AFFAIRES INDIENNES
ET DU NORD CANADIEN

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CORRESPONDENCE AND INVOICES MUST SHOW THESE NUMBERS → *NUMÉROS À INDIQUER SUR LETTRES ET FACTURES*	Project – *Projet* No *N°*	Contract – *Contrat* No *N°*

Enc. *Ch. Fin*	Prog.	Vote *Crédit*	Resp. Ctre. *Ctre. de resp.*	Activity *Sect. d'act.*	Financial Control *Contrôle comptable* (1)	(2)	Line Obj. *Art. d'exéc.*	Parl. – *N° de* Vote *cr. parl.*	Authority – *Autorisé par*

GENERAL DESCRIPTION OF WORK OR SERVICE – *DESCRIPTION GÉNÉRALE DES TRAVAUX OU SERVICE*

1/We hereby offer to supply the materials and perform the work or service referred to hereunder on the covenants and agreements contained hereunder AND ON THE REVERSE SIDE HEREOF, WITHIN THE TIME SPECIFIED

Par les présentes, j'offre (nous offrons) de fournir le matériel et d'exécuter les travaux ou les services mentionnés ci-dessous, conformément aux stipulations exposées ci-dessous et AU VERSO DES PRÉSENTES, DANS LES DÉLAIS PRESCRITS

Details – *Détails*	Unit Price *Prix Unitaire*		Total	
Terms of payment will be as follows:				
(a) $1,000.00 after the end of the months of December 1970, January, February, and March 1971.	1,000	00	4,000	00
(b) After March 31, 1971 an invoice for travel expenses (Payable in accordance with Treasury Board Travel Directive) up to a maximum of $1,000.00. A charge for administrative costs for $1,000.00 which represents 20% of costs incurred to the end of this period.	1,000 1,000	00 00	1,000 1,000	00 00
(c) Upon submission of the final report in a form acceptable to the Regional Director of the C.W.S. in Edmonton an invoice in the amount of $1,400.00 for this report and a further administrative charge of $600.00 representing the balance of the charges due for administrative purposes.	2,000	00	2,000	00
It is agreed that the Contractor's personnel may, on reasonable notice, seek advice or information on matters pertaining to this contract from Canadian Wildlife Service officers in Saskatoon, Saskatchewan or Edmonton, Alberta.				
It is agreed that there is no obligation on the part of the Contractor or Her Majesty to enter into a further contract related to the investigations, determinations or assessments of social and economic values of dietary birds. ...				

The parties to this contract covenant and agree as follows:

1. The Contractor will indemnify and save harmless Her Majesty from and against all claims, demands, loss, costs, damages, actions, suits or other proceedings by whomsoever made, brought or prosecuted in any manner based upon, occasioned by or attributable to the activities of the Contractor under this contract.

2. The various works or services are to be carried out and completed to the full satisfaction of the officer signing on behalf of Her Majesty.

3. The Contractor may not assign or sublet this contract or any part thereof without the written consent of the officer signing on behalf of Her Majesty.

4. Her Majesty reserves the right to terminate this contract at any time before completion for any reason whatsoever. In the event of such termination Her Majesty will pay to the Contractor an amount that, in the opinion of the officer signing on behalf of Her Majesty, is equal to that portion of the work or service completed up to the day of termination.

5. In engaging labour for the work or service contemplated by this contract the contractor will employ as far as practicable and consistent with efficiency and economy only Canadian labour with local labour receiving preference.

6. No member of the House of Commons shall be admitted to any share or part of this contract or any benefit arising therefrom.

7. Labour Conditions attached are included in this contract.

Les parties au présent contrat s'engagent à respecter les stipulations suivantes:

1. L'entrepreneur indemnisera Sa Majesté et la mettra à couvert de toutes réclamations, mises en demeure, pertes, frais, dommages-intérêts, actions ou autres procédures, faits, intentés ou engagés de toute manière par qui que ce soit, et fondés sur, occasionnées par ou attribuables à l'activité de l'entrepreneur en vertu du présent contrat.

2. Les divers travaux ou services doivent être exécutés et terminés à l'entière satisfaction du fonctionnaire qui contresigne le présent contrat au nom de Sa Majesté.

3. L'entrepreneur ne peut céder ou sous-affermer le présent contrat ni toute partie de ce dernier sans le consentement écrit du fonctionnaire qui signe au nom de Sa Majesté.

4. Sa Majesté se réserve le droit de résilier le présent contrat en tout temps avant le parachèvement de son exécution pour toute raison que ce soit. En cas de résiliation, Sa Majesté versera à l'entrepreneur un montant qui, selon l'avis du fonctionnaire qui signe au nom de Sa Majesté, correspond aux travaux ou aux services exécutés jusqu'à la date de la résiliation.

5. En recrutant la main-d'oeuvre requise pour les travaux ou les services prévus dans le présent contrat, l'entrepreneur embauchera, dans la mesure où la chose sera possible et compte tenu de l'efficacité et de l'économie, uniquement de la main-d'oeuvre canadienne et accordera la préférence à la main-d'oeuvre locale.

6. Aucun député ne participera au présent contrat ou n'en tirera un bénéfice quelconque.

7. Les conditions de travail annexées, constitueront une partie du présent contrat.

DEPARTMENT OF INDIAN AFFAIRS
AND NORTHERN DEVELOPMENT

TENDER & CONTRACT

(FOR SERVICE OR WORK
NOT EXCEEDING $5,000.00)

MINISTÈRE DES AFFAIRES INDIENNES
ET DU NORD CANADIEN

SOUMISSION ET CONTRAT

(POUR SERVICE OU TRAVAUX
JUSQU'À CONCURRENCE DE $5,000.00)

CORRESPONDENCE AND INVOICES MUST SHOW THESE NUMBERS →
NUMÉROS À INDIQUER SUR LETTRES ET FACTURES

Project – Projet No / N°	Contract – Contrat No / N°

Enc. / Ch. Fin	Prog.	Vote / Crédit	Resp. Ctre. / Ctre. de resp.	Activity / Sect. d'act.	Financial Control / Contrôle comptable (1)	(2)	Line Obj. / Art. d'exéc.	Parl. – N° de Vote / cr. parl.	Authority – Autorisé par

GENERAL DESCRIPTION OF WORK OR SERVICE – *DESCRIPTION GÉNÉRALE DES TRAVAUX OU SERVICE*

I/We hereby offer to supply the materials and perform the work or service referred to hereunder on the covenants and agreements contained hereunder AND ON THE REVERSE SIDE HEREOF, WITHIN THE TIME SPECIFIED

Par les présentes, j'offre (nous offrons) de fournir le matériel et d'exécuter les travaux ou les services mentionnés ci-dessous, conformément aux stipulations exposées ci-dessous et AU VERSO DES PRÉSENTES, DANS LES DÉLAIS PRESCRITS

Cont... Details – *Détails*	Unit Price / *Prix Unitaire*	Total
No release or publication of information obtained or assembled as a consequence of the contract may be published or released to the press or in any way provided to persons other than to a responsible officer of the Canadian Wildlife Service.		
THE MAXIMUM AMOUNT PAYABLE UNDER THIS CONTRACT SHALL NOT EXCEED / *LE PAIEMENT MAXIMUM EXIGIBLE AUX TERMES DU PRÉSENT CONTRAT NE DÉPASSERA PAS* $8,000.00	GRAND TOTAL / *TOTAL GLOBAL*	8,000.00

M. C. Kupsch
Signature of Contractor – *Signature de l'entrepreneur*

March 5/71
Date

Phyllis Smart
Witness – *Témoin*

NAME AND ADDRESS OF CONTRACTOR / *NOM ET ADRESSE DE L'ENTREPRENEUR*

Institute of Northern Studies
University of Saskatchewan
Saskatoon, Saskatchewan

ACCEPTED ON BEHALF OF HER MAJESTY THE QUEEN IN RIGHT OF CANADA THIS / *OFFRE ACCEPTÉE AU NOM DE SA MAJESTÉ DU CHEF DU CANADA CE*

15th Day of / *Jour de* March, 19 71

ORIGINAL SIGNED BY

Director
Title – *Titre*

ORIGINAL SIGNED BY
Signature

John R. Jensen

DEPUTY DIRECTOR

MAIL INVOICES (– COPIES) TO:
EXPÉDIER LES FACTURES (EN – COPIES) À:

IAND 10-82 (1-70) 7530-21-023-4491

The parties to this contract covenant and agree as follows:

1. The Contractor will indemnify and save harmless Her Majesty from and against all claims, demands, loss, costs, damages, actions, suits or other proceedings by whomsoever made, brought or prosecuted in any manner based upon, occasioned by or attributable to the activities of the Contractor under this contract.

2. The various works or services are to be carried out and completed to the full satisfaction of the officer signing on behalf of Her Majesty.

3. The Contractor may not assign or sublet this contract or any part thereof without the written consent of the officer signing on behalf of Her Majesty.

4. Her Majesty reserves the right to terminate this contract at any time before completion for any reason whatsoever. In the event of such termination Her Majesty will pay to the Contractor an amount that, in the opinion of the officer signing on behalf of Her Majesty, is equal to that portion of the work or service completed up to the day of termination.

5. In engaging labour for the work or service contemplated by this contract the contractor will employ as far as practicable and consistent with efficiency and economy only Canadian labour with local labour receiving preference.

6. No member of the House of Commons shall be admitted to any share or part of this contract or any benefit arising therefrom.

7. Labour Conditions attached are included in this contract.

Les parties au présent contrat s'engagent à respecter les stipulations suivantes:

1. L'entrepreneur indemnisera Sa Majesté et la mettra à couvert de toutes réclamations, mises en demeure, pertes, frais, dommages-intérêts, actions ou autres procédures, faits, intentés ou engagés de toute manière par qui que ce soit, et fondés sur, occasionnées par ou attribuables à l'activité de l'entrepreneur en vertu du présent contrat.

2. Les divers travaux ou services doivent être exécutés et terminés à l'entière satisfaction du fonctionnaire qui contresigne le présent contrat au nom de Sa Majesté.

3. L'entrepreneur ne peut céder ou sous-affermer le présent contrat ni toute partie de ce dernier sans le consentement écrit du fonctionnaire qui signe au nom de Sa Majesté.

4. Sa Majesté se réserve le droit de résilier le présent contrat en tout temps avant le parachèvement de son exécution pour toute raison que ce soit. En cas de résiliation, Sa Majesté versera à l'entrepreneur un montant qui, selon l'avis du fonctionnaire qui signe au nom de Sa Majesté, correspond aux travaux ou aux services exécutés jusqu'à la date de la résiliation.

5. En recrutant la main-d'oeuvre requise pour les travaux ou les services prévus dans le présent contrat, l'entrepreneur embauchera, dans la mesure où la chose sera possible et compte tenu de l'efficacité et de l'économie, uniquement de la main-d'oeuvre canadienne et accordera la préférence à la main-d'oeuvre locale.

6. Aucun député ne participera au présent contrat ou n'en tirera un bénéfice quelconque.

PART 4

MEMO TO: Dr. A. H. Macpherson, Regional Director,
Canadian Wildlife Service,
515 - 10015 103rd Avenue,
Edmonton 15, Alberta.

FROM: Dr. W. O. Kupsch, Director,
Institute for Northern Studies,
University of Saskatchewan,
Saskatoon, Saskatchewan.

DATE: December 29, 1970.

ECONOMIC AND SOCIAL VALUES OF MIGRATORY BIRDS

First Monthly Progress Report

As detailed in the contract between CWS and INS, in which INS agrees to investigate and define problems in determining and assessing the current and future social and economic needs, values, and aspirations of society for the migratory bird resource, the Contractor is to submit at the end of each month a progress report and four copies of invoices. This is the first of such progress reports.

After December 1, 1970, the start of the term of the contract, INS engaged Mr. J. C. Stabler, Associate Professor of Economics, and Mr. M. Epstein, Assistant Professor of Commerce, on a part-time basis to commence the study. They report that they visited CWS in Edmonton on December 11 to gain a better insight into the requirements of CWS regarding the study by talking to the staff involved. They also visited the CWS offices in Saskatoon twice for the

same purpose. A student is now helping Messrs. Stabler and Epstein by searching the libraries of the University of Saskatchewan for relevant materials. Notes on the interviews and the available published studies have been prepared.

MEMO TO: Dr. A. H. Macpherson, Regional Director,
Canadian Wildlife Service,
515 - 10015 103rd Avenue,
Edmonton 15, Alberta.

FROM: Dr. W. O. Kupsch, Director,
Institute for Northern Studies,
University of Saskatchewan,
Saskatoon, Saskatchewan.

DATE: January 28, 1971.

ECONOMIC AND SOCIAL VALUES OF MIGRATORY BIRDS

Second Monthly Progress Report

During January Professors Stabler and Epstein, helped by a student researcher employed on a casual basis, reviewed a considerable body of literature dealing with the economic and social values of various wildlife resources. In particular they attempted to derive a value for products disposed of in situations where normal market channels are bypassed either in part or totally. They found this literature search rather disappointing as far as specific, usuable information is concerned. On account of this they have now formulated some ideas of their own not closely related to work done by others. They have submitted to the Institute for Northern Studies a rough draft copy of these thoughts. This interim report of ten typewritten pages is on file at the Institute. As it, after revision, will be incorporated in Professors Stabler and Epstein's final report, we do not submit it to you at this time. Plans for next month's work include a meeting with University personnel in other areas than economics in order to get the required input into the study from other sciences.

MEMO TO: Dr. A. H. Macpherson, Regional Director,
Canadian Wildlife Service,
515 - 10015 103rd Avenue,
Edmonton 15, Alberta.

FROM: Dr. W. O. Kupsch, Director,
Institute for Northern Studies,
University of Saskatchewan,
Saskatoon, Saskatchewan.

DATE: February 25, 1971.

ECONOMIC AND SOCIAL VALUES OF MIGRATORY BIRDS

Third Monthly Progress Report

During January and early February, after further literature studies and discussions with other interested faculty members, Professors Stabler and Epstein produced a preliminary document outlining their recommended methodology. This was presented to a meeting of the Steering Committee held on February 9. A copy was later presented for comment to Dr. W. J. D. Stephen (CWS). A critique of certain aspects of the methodology was written by Mr. D. Schweitzer who has undertaken somewhat similar studies on transportation in the Canadian Arctic. Minutes of the meeting of the Steering Committee are now being prepared and will be included with the final report. After the meeting the principal investigators held individual interviews with some of the members in order to get a greater contribution from the sciences other than economics. Mr. Schweitzer, who is a graduate in Engineering, takes a great interest in the CWS project and may possibly be available to direct the full scale study if such is to be undertaken. Also, we have now contacted a systems ecologist competent to undertake a simulation study on a part-time basis. This person, as a biologist, would complement Mr. Schweitzer's work.

MEMO TO: Dr. A. H. Macpherson, Regional Director,
Canadian Wildlife Service,
515 - 10015 103rd Avenue,
Edmonton 15, Alberta.

FROM: Dr. W. O. Kupsch, Director,
Institute for Northern Studies,
University of Saskatchewan,
Saskatoon, Saskatchewan.

DATE: February 25, 1971.

ECONOMIC AND SOCIAL VALUES OF MIGRATORY BIRDS

Fourth Monthly Progress Report

During March Professors Stabler and Epstein rewrote the report which had appeared in draft form at the meeting of the Steering Committee held on February 9. They did so in consultation with several members of the Steering Committee who had expressed their anxiety for greater involvement of the human sciences such as anthropology, sociology, and psychology. Particularly with respect to investigations involving the use of questionnaires it was felt that greater use be made of the body of knowledge and experience existing in these sciences. Also during this month active participation by Mr. Doug Schweitzer, an engineer who has undertaken similar system studies dealing with transportation in the north, became apparent. Professors Stabler and Epstein submitted their report to this office on March 15 and following that date assembly of all documents and final typing of the report on the first phase of the study commenced.

PART 5

INSTITUTE FOR NORTHERN STUDIES

University of Saskatchewan
(Saskatoon)

MINUTES OF MEETING
of Steering Committee

Canadian Wildlife Service Project

ECONOMIC AND SOCIAL VALUES OF MIGRATORY BIRDS

On Tuesday, February 9, 1971, starting at 3 p.m., a meeting was held in the Conference Room, General Purpose Building, sponsored by the Institute for Northern Studies. The following persons were present: J. C. Stabler (Economics and Political Science), M. Epstein (Commerce), D. Schweitzer (Engineering), E. Abramson (Sociology), J. B. Gollop (Canadian Wildlife Service, Saskatoon), S. N. Kulshreshtha (Agricultural Economics), W. O. Kupsch (Institute for Northern Studies), J. G. McConnell (Geography), J. F. V. Millar (Anthropology), H. R. Nixon (Physical Education), J. A. Wedgewood (Planning), R. G. Williamson (Institute for Northern Studies).

A brief review of the work done so far on the Canadian Wildlife Service Project was presented by W. O. Kupsch. After signing the contract for the feasibility study Professors Stabler and Epstein were engaged on a part-time basis to start on a report to be submitted to CWS by the end of March, 1971. They first contacted the CWS in Edmonton to get a clearer picture of what is wanted. A graduate student was asked to make a search of published works dealing

with similar topics. The present meeting was mainly a device to find out what sciences other than economics and biology can contribute to the study which should be multi-disciplinary. This will be followed up by individual interviews with those persons who are in a position and wish to contribute to the study.

Professor Stabler mentioned that the results from the literature search had been disappointing particularly with respect to any novel operational techniques which are of primary concern at this stage of the project. It was therefore felt that the best first approach would be to use conventional standard economic techniques and methods. These are to be reviewed here today on the basis of a preliminary paper written by Professors Stabler and Epstein. Comments are invited and alternative suggestions welcomed, particularly from other social scientists. Professor Stabler then went on to elaborate on his working paper, a final version of which will form the core of the report to CWS and need not be repeated here.

A further elaboration and critique of the proposed methodology was presented by Mr. Doug Schweitzer who proceeded to put the whole problem in a systems approach content. His comments and suggestions will also be incorporated in the report to CWS.

After the presentations by Stabler and Schweitzer which will be recorded in full at a later stage in the program, followed an extensive discussion about the merits, difficulties, and biases

of the methods suggested for acquiring the basic data. Although no viable alternatives were offered to the questionnaires and interviews proposed as an essential tool for gathering information, they were criticized on many aspects. It became clear that the text, distribution, and evaluation of the questionnaires has to involve several people on campus familiar with and experienced in these matters. Professor Epstein kept notes on the various technical comments received and in the next few weeks Professors Stabler and Epstein will follow up the comments received today by private interviews.

The meeting adjourned at 5 p.m.

PART 6

PART 6

ECONOMIC AND SOCIAL VALUES

OF

MIGRATORY BIRDS

BY

J. C. STABLER AND M. EPSTEIN

March, 1971

Saskatoon

The writers of the present report took the following statement of requirements from the Canadian Wildlife Service as the basis of their research:

(1) Objective. To determine and assess the current and future economic and social needs, requirements, and aspirations of society for the migratory bird resource.

(2) Goals. (i) To identify and quantify, by various types of use, the current and potential economic benefits to be derived from different species of migratory birds.

(ii) To identify and determine the current and potential non-economical social benefits that migratory birds afford society.

The essential prerequisite, in beginning to satisfy the above requirements, is to define an approach which will facilitate establishing values indirectly, that is, by imputation.

The need for an indirect approach arises from the differences between producing and selling a product under normal market conditions, compared with those surrounding the production and disposal of a product which does not pass through the market place.

Any productive[1] activity, conducted either privately or by a government agency, involves the use of scarce resources which have alternate uses. If the resources are privately used they give rise to a product or service which is then offered for sale in the market place.

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[1] Production is defined as any process which creates value.

If the receipts are great enough to cover all costs[2] then society has given sanction to the continued use of the resources in this manner.

While some government agencies conduct their affairs in much the same way as private business firms (Air Canada for example), the majority do not. Most government agencies, including the Canadian Wildlife Service, produce products (or services) that are not sold directly to the groups for which they are produced. Rather they are paid for in advance, from general tax revenue, and provided "free", or at a nominal additional charge, to all who care to utilize them.[3]

A question arises as to the value of products thus produced. Since their disposal does not take place under circumstances that would directly test society's acceptance by confronting the user with a price at the time of purchase, it is uncertain whether too many or too few resources are being utilized, or whether the resources used are being deployed to the greatest advantage.

The need to improve the information base upon which allocation of resources to public recreation programs is made has recently led to attempts to develop procedures which would aid in determining

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[2] This includes a return to all factors at least equal to that which could be earned in the next best alternative occupation.

[3] Under certain circumstances, however, conditions and limits are specified regarding the nature or amount of utilization permitted.

the value of non-priced public goods.[4] In attempting to define an approach that would begin to satisfy the requirements of the Canadian Wildlife Service we have examined a number of these endeavors. The techniques which appeared most promising for this work were those related to the concepts of opportunity cost and consumer's surplus.[5]

The technique actually adopted for recommendation and preliminary testing utilizes a two-step approach which is based on the

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[4] The increasing importance of being able to estimate better the benefits derived from non-priced public recreation programs is succinctly discussed by John V. Krutilla and Jack L. Knetsch in "Outdoor Recreation Economics," Annals of the American Academy of Political and Social Science, May, 1970, pp. 63-70. Some of the more promising methods of estimation are discussed in Marion Clawson and Jack L. Knetsch, Economics of Outdoor Recreation (Baltimore: Johns Hopkins Press, 1966); James A. Crutchfield, "Valuation of Fisheries Resources," Land Economics, May, 1962, pp. 145-54; and Peter H. Pearse, "A New Approach to the Evaluation of Non-Priced Recreational Resources, Land Economics, February, 1968, pp. 87-99.

[5] Opportunity cost is defined as the value of the foregone alternative, while consumer's surplus refers to the difference between what a consumer actually pays and what he would be willing to pay in order to continue to obtain a good or service. Several other techniques were examined but rejected as not being operational in the present situation, although with additional work some of them might be useful. These techniques are discussed elsewhere in the report.

concept of consumer's surplus.[6] This approach involves the use of a theoretical framework designed to facilitate determination of the monetary valued attached to the presence of the migratory bird resource by various groups in society.

The theoretical framework employs the following (testable) hypotheses:

1. The <u>average</u> user enjoys a consumer's surplus.
2. The public derives satisfaction from the presence of migratory birds and is willing to accept responsibility for commitment of the resources necessary to make their continued presence possible.
3. The level (and type) of interest in migratory birds varies between users.
4. Within interest groups the ability and willingness to support the management programs necessary to ensure the continued presence of migratory birds is directly related to income.
5. The interest in migratory birds is affected by the opportunity to utilize them, opportunity being determined by two factors. The first is whether

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[6] The opportunity cost approach was rejected because in some cases the migratory bird resource is apparently utilized incidental to a more important activity. Presence of migratory birds under such circumstances becomes simply a windfall gain. Opportunity cost is thus zero. A complete discussion of the concept of consumer's surplus is found in J.R. Hichs, <u>A Revision of Demand Theory</u> (Oxford: Clarendon Press, 1956).

> or not, and in what quantity, the birds are physically present in the area in which the person lives. The second is the amount of leisure time a person has.

The first step in the two-step approach mentioned above requires estimating the consumer's surplus which various groups realize because of the presence of, and therefore the opportunity to enjoy, migratory waterfowl. This is aside from any additional expenditures which are made for equipment, transportation, etc. in actually taking advantage of the opportunities offered by their presence. In this sense the first step involves estimating an amount which is not unlike estimating the maximum cover charge that various groups would be willing to pay for access to a nightclub.

The second step involves estimation of the extra expenditures that various groups will make after having paid the cover charge. This amount may be zero for some groups, of course, in which case the estimate arrived at in step one is all that is required. For others, additional expenditures may be substantial.

In Figure 1, the idea expressed in hypothesis 1 is given form in the common demand schedule D. The vertical supply schedule S indicates that the supply of birds is fixed for the season by natural conditions and the reproductive cycle. Through time, effort directed toward increasing the migratory bird population would cause the position of the "seasonal" supply schedule to move to the right,

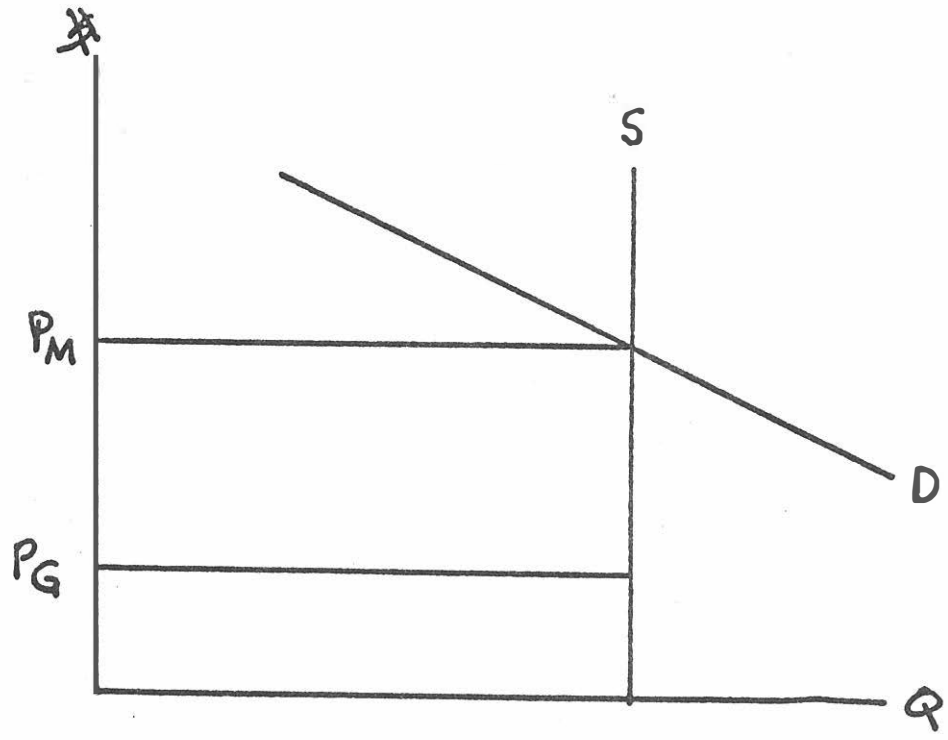

Figure 1 - For Explanation see text.

D = Demand schedule.

S = Supply schedule.

Price in dollars on the ordinate increasing to top.

Quantity or supply on the abscissa increasing to right.

while a reduced effort would cause it to move to the left[7].

Under a private market system the intersection of D and S would establish a price, P_M, which would cause the market to "clear". Under existing arrangements, however, the price charged, P_G (monies from general tax revenue expended by the government divided by number of taxpayers[8]) is less than the market price[9]. Thus the <u>average</u> user enjoys a surplus equal to the difference between what he does pay and what he would be willing to pay for the opportunity to use the resource.[10] Estimation of this difference can be accomplished through the use of a carefully designed questionnaire.

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[7] During the past 25 years the overall population of migratory birds does not appear to have demonstrated a trend either to larger or smaller numbers, although the position of individual species may have either improved or deteriorated. This suggests that the effort expended by CWS, other government agencies in Canada and elsewhere, and private groups has just been sufficient to maintain the population at approximately its present size during the period in question.

[8] This could be adjusted to reflect the greater contribution made by persons in higher income brackets.

[9] Thus price no longer effectively rations the item. This is achieved by providing sanctuaries, imposing limits and controls of various types, and by charging fines for violation of the rules.

[10] A consumer's surplus may, of course, exist under private market arrangements as long as some buyers would be willing to pay more than the price charged.

It is necessary to recognize, however, that the needs, and therefore the demand characteristics of the various user groups will differ. Because of this it is necessary to identify separately each of these groups. Accordingly, it is possible to distinguish two major groups whose use of the migratory bird resource is sufficiently different to warrant separate classification.

The first major group consists of all those persons who utilize the migratory bird resource primarily for recreational purposes. This major group is further sub-divided into four categories according to type of use and (probably) level of interest. These are:

1a. Hunters who pursue ducks, geese, and other migratory species for sporting purposes;

1b. Bird watchers who study the habits of migratory (as well as non-migratory) birds for recreational or educational purposes;

1c. Campers, fishermen, and others who regularly utilize outdoor recreational facilities but who are not members of either group 1a or 1b. (Because of their interest in the outdoors and because wildlife is an element of the natural environment, this group as a whole will likely have a greater interest in migratory birds than the groups which do not frequently participate in any form of outdoor recreation. This group may well contain the majority of the nation's population);

1d. The remainder of the general public. This group does not regularly participate in outdoor activities and thus would not explicitly utilize the migratory bird resource in the same manner as do members of the above groups. Nevertheless, persons in this group may enjoy the occasional sight of a flight of migratory birds or may derive some pleasure simply out of knowing they exist.

The second major group is made up of persons whose livelihood is much more directly affected by the existence of migratory birds. This group is also sub-divided into two categories. These are:

2a. Native people living in the North who utilize migratory birds as an essential item in their diet for at least part of the year;

2b. Those people farming in major flyways and raising crops upon which migratory birds feed.

While the model described above, and the questionnaire approach, could be used for all Group 1 type users, each should be treated separately in order to obtain specific and more accurate information. It is likely, for example, that the slope of the demand schedule will become less steep (more price-elastic) in going from category 1a through 1c. It is likely, too, as indicated in hypothesis 5, that the level of interest in migratory birds is affected by their natural presence (or lack of it) in the vicinity where the person lives. Both

the presence of a flyway and the degree of urbanization are likely to affect the opportunity to enjoy migratory wildfowl.

Finally, separation of users by income class would be desirable both because those with higher taxable income currently contribute more to the general tax revenue and by implication to migratory bird management schemes, and because such persons are likely to be more able and more willing to make a larger additional contribution.

The sample of persons in Group 1 to whom the questionnaire is sent would thus be identified according to the following classifications: location, user type, and income group.

The following schema illustrates the structure of the sample.

User Group		On Flyway								Off Flyway							
		Urban				Rural				Urban				Rural			
		1a	1b	1c	1d	1a	1b	1c	1d	1a	1b	1c	1d	1a	1b	1c	1d
Income Group	$1st	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
	2nd	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
	3rd	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
	4th	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--

Essentially the questionnaire would ask the recipient to identify the difference between what he currently pays and what he

would be willing to pay in order to ensure a continued supply of migratory birds equal in size to the present population. The answer would approximate the difference between P_M and P_G in Figure 1. This question could be asked in a number of different ways. One approach would be to inquire of the recipient the maximum additional amount he would be prepared to pay in the form of higher taxes, while a second would be to inquire about the maximum transfer from other government programs, taxes unchanged. A third, and somewhat different approach, could inquire about the compensation that would be required to offset the loss of all or part of the present migratory bird population. Any number of additional questions could be asked, of course, such as whether society would prefer a larger migratory bird population, or whether residents of urban areas would prefer more sanctuaries nearer cities, etc. The intensity of any such desire could also be measured by a further inquiry concerning willingness to pay. The answers to such questions would provide the information necessary to determine whether or not, from Group 1's perspective, enough resources are being devoted to migratory bird management programs, and whether those resources being used are being allocated in accordance with the desires of the users.

Regarding Group 2, the interest of farmers (2b) could be ascertained by a similar approach. The question would be to determine not how much more they would be willing to pay to ensure continued existence of the present population, but how much more (if anything) they would have to be paid to compensate for damages done by the

present population[11].

Regarding the use of migratory birds by native persons, the present type of framework for analysis might be useful, but broader questions appear to be at issue than can be adequately handled within the confines of the above system. What seems to be called for in this case is a separate study by the native people themselves with the aid, possibly, of anthropologists to determine the extent to which they are dependent on this resource for a means of existence. If the dependence is great, and if society is determined to preserve the lifestyle of this group under any circumstances, then this becomes the overriding constraint to which all other programs must adjust.

In summary to the discussion of step one in the two-step approach, it is suggested that a number of questionnaires be designed, each employing an alternative method of estimating the amount of surplus enjoyed by Group 1 users. These questionnaires should be tested on small samples to determine which method is most satisfactory and where the design should be altered or improved. The same approach is suggested for arriving at the amount of (assumed) loss being experienced by farmers (2b). Finally, as stated above, a completely different approach is suggested for ascertaining the interests of native peoples (2a).

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11 In the event that farmers are also members of Group 1, adequate compensation for migratory bird damage to the farming operation should eliminate, or at least reduce, any conflict in interest.

Turning to step two, hunters and bird watchers in particular make additional expenditures in order to take advantage of the recreational and educational opportunities provided by the presence of migratory birds. The sum of these expenditures constitute an additional portion of the value placed on this resource by members of these groups.

Some information pertinent to this question is available in published form, but some would have to be gathered by a second questionnaire to hunters and bird watchers. To use hunters as an example, the questionnaire would request those in the sample to record the expenditures made for licenses, shells, travel, meals, and incidentals while hunting migratory birds during the forthcoming season. In addition, the replacement value of equipment purchased for hunting migratory birds should be requested and an estimate for depreciation calculated.[12] In summary form this is expressed as:

$HX = f$ (L (license), shells, travel, meals, misc., depreciation on equipment).

Total hunter expenditure would then be equal to the average expenditure by hunters in the sample multiplied by the number of licences sold.

$$HX = f\left(\frac{HX}{L} \times L\right)$$

This would then constitute an expression of the additional value of

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12 In the case of equipment used for more than one purpose, the fraction of use devoted to the pursuit of migratory birds would also have to be calculated.

the migratory bird resource to hunters as a group.[13] The value of a day's hunting could then be approximated by dividing estimated total hunter expenditures by the estimated number of days hunted.

$$\frac{HX}{\text{Days Hunted}}$$

The value of a bird could be calculated in a similar fashion by dividing expenditures by the total number (or number and type) of birds shot.[14]

$$\frac{HX}{\text{Birds Shot}} \quad \text{or} \quad \frac{HX\ \text{Geese}}{\text{Geese Shot}}; \qquad \frac{HX\ \text{Ducks}}{\text{Ducks Shot}}; \quad \text{etc.}$$

A similar approach could be used to estimate explicit expenditures made by bird watchers. In both instances it would appear to be useful to retain the location and income stratification of the basic questionnaire.

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[13] An alternative method of calculating consumer's surplus for hunters would be to assume that, within income groups, the person spending the most on hunting would enjoy no surplus. Surplus for the other members of that income group would then be the difference between what was actually spent and the marginal (highest) expenditure. This approach was used by Pearse, op. cit. This method of necessity assumes similar preference patterns within income groups.

[14] It would be difficult to estimate separately the value for different species because they may constitute a "joint demand." How to allocate expenditures thus becomes a problem.

Some additional information pertinent to bird management programs could perhaps be obtained through the statistical analysis of factors influencing the number of licences sold and the size of the bird population. Some relationships that might be useful to try are listed below.

1. What determines the number of licences sold?

$$L_t = f(\text{Price } L_t)$$

$$L_t = f(\text{Price } L_t, \frac{Y}{pop})$$

$$L_t = f(\text{Price } L_t, \frac{Y}{pop}_t)$$

$$L_t = f(\text{Price } L_{t-1}, \frac{Y}{pop}_{t-1})$$

$$L_t = f(B_{shot_{t-1}})$$

$$\frac{L_t}{pop_{15-65}} = f\ \frac{B_{shot_{t-1}}}{L_{t-1}}$$

$$\frac{L_t}{pop_{15-65}} = f(\text{Price } L_t)$$

$$\frac{L_t}{pop_{15-65}} = f(\text{Price } L_t, \frac{Y}{pop}$$

$$\frac{L_t}{pop_{15-65}} = f(\text{Price } L_t, \frac{Y}{pop}_t)$$

$$\frac{L_t}{pop_{15-65}} = f(\text{Price } L_{t-1}, \frac{Y}{pop}_{t-1})$$

$$L_t = f(\text{Price } L_t, \frac{Y}{pop}, B_{shot_{t-1}})$$ also try with time as a variable

$$L_t = f(\text{Price } L_t, \frac{Y}{pop}, \frac{B_{shot_{t-1}}}{L_{t-1}}$$

$$\frac{L_t}{pop_{15-65}} = f(\text{Price } L_t, \frac{Y}{pop}, {}^{B}shot_{t-1})$$

$$\frac{L_t}{pop_{15-65}} = f(\text{Price } L_t, \frac{Y}{pop}, \frac{{}^{B}shot_{t-1}}{L_{t-1}})$$

$$L_t = f(\text{Price } L_t, \frac{Y}{pop}, {}^{B}shot_{t-1})$$

$$L_t = f(\text{Price } L_t, \frac{Y}{pop}, {}^{B}shot_{t-1})$$

$$\frac{L_t}{pop_{15-65}} = f(\text{Price } L_t, \frac{Y}{pop}\ t, {}^{B}shot_{t-1})$$

$$\frac{L_t}{pop_{15-65}} = f(\text{Price } L_t, \frac{Y}{pop}\ t, \frac{{}^{B}shot_{t-1}}{L_{t-1}})$$

Where L = licence t = the time period in question
Y = income Δ = change (between t and t-1)
pop = population
${}^{B}shot$ = birds shot

It is recognized that some of the data called for here may not be available. This suggests that, if this information could be important, steps be taken in order to ensure its collection for future use. In the meantime, if such data are available for the adjacent American states, it might be reviewed to see if they would be useful for the study by the Canadian Wildlife Service.

2. Supply - What determines the size of the bird population?

B_t = population of birds as of September 1

$$B_t = F(B_{t-1})$$

$$B_t = f(B_{t-1}, {}^{B}shot_{t-1})$$

$$B_t = f(B_{t-1}, {}^{B}shot_{t-1}, Rainfall_{March\text{-}June_t})$$

$$B_t = f(B_{t-1}, {}^{B}shot_{t-1}, Rain_{M\text{-}J_t}, \sum_{t=1}^{n} X_t) \quad n = 1 - 5 \text{ also with time}$$

$$B_t = f(B_{t-1}, {}^{B}shot_{t-1}, Rain_{M\text{-}J_t}, \sum_{t-1}^{n} X_t) \quad n = 1 - 5$$

Where symbols are as above and where M-J equals May to July, and

$\sum_{t=1}^{n} X_t$ = expenditures on conservation during period n.

As mentioned earlier in this paper, the consumer's surplus model presented above should prove to be the best available measure of the present and future economic benefits to society of the migratory bird resource. But, methods have also been investigated in an attempt to measure the non-economic, social benefits. The necessity for this investigation is partly due to the need for a quantitative measure of value to society, other than monetary. The difficulties inherent in this are many, not the least of which is the fact that the most common measure of value in our society is dollars. Thus, it was felt, possibly a measure of number of people rather than number of dollars was in order.[15]

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15 In the economic context we measure the intensity of the demand so that an individual with a very high intensity of demand can express it in the marketplace through expenditures or consumer's surplus. In the political context, we have only one vote and though there may be intensity, it must be expressed through different channels, for example, pressure on government officials.

But, before considering other methods of measuring the social demand for this resource, we should understand demand from a psychological perspective. Psychologically, an individual's demand can be measured by his attitudes. Danial Katz defines attitudes as "the predisposition of the individual to evaluate some object or aspect of his world in a favorable or unfavorable manner. Opinion is the verbal expression of an attitude . . . "[16].

Although attitudes can often be detected through psychological and sociological testing, and although opinions are often seen in heated discussions, overt action on behalf of an attitude cannot be expected. The degree of the overt action, if any, would depend upon the intensity of the attitude and the personality of the individual or individuals. Thus, it does not follow that, by testing for and discovering a prevailing attitude in a community, positive community action in that direction will occur.

Thus, psychological literature indicates that attitudes can be accurately measured as favorable or unfavorable and many techniques are available to do this. But, as mentioned earlier, the intensity of the attitude is of significant concern. With this in mind, many techniques were investigated in attempting to obtain a measure of the social benefit to society of the migratory bird resource. Literature from all disciplines was evaluated. Journals

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16 Danial Katz, "Functional Approach to the Study of Attitudes," Public Opinion Quarterly, Vol. 24, S. 1960, p. 168.

of land use, recreation, urban planning, wildlife management, sociology, art, psychology, etc. were investigated. From this search, it was found that much has been written in the areas of wildlife management and the social values of related resources to society. But, most were descriptive studies with no attempt at quantification, and of those that did make some attempt to quantify these values, the measures that were used were of little validity.[17] Thus, research techniques that could measure this social benefit were explored and those that were felt to be most applicable are discussed here.

In the testing of individuals, objectivity is an important aspect. The Guttman scale offers objective ranking as to scale positions with a minimum of error. The Guttman scalogram is primarily

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17 One of the most interesting discussions of the social values to society of wildlife was the Symposium on Wildlife Management and Land Use held in Nairobi, Kenya, July 5-8, 1967. The first objective of the symposium was to "Appraise the value of wildlife to East Africa in the most quantitative terms possible." (Special Issue of the East African Agricultural and Forestry Journal on the Proceedings of the Symposium on Wildlife Management and Land Use, Vol. XXXIII, June, 1968, p. 4). But, of the over fifty papers presented, none even made an attempt at quantification other than the tabulation of expenditures. In the summation of the future research needs as determined by the symposium, "the need for research on the attitudes of people affected by wildlife schemes or improvements" (p. 288) is included. (It is hoped that the present study will answer a part of this question.)

based on the concept of successive hurdles as is found in many intelligence tests. That is, if one can master a difficult concept or task he can also handle any simpler concept or task. This is thus applicable to the measurement of the intensity of attitudes. In the design of the Guttman scalogram, a series of questions are posed to the respondent. Each question can be answered by either a "yes" or a "no", and within a series each question measures a different level of the intensity of the attitude. The responses are then scored and a pattern will emerge (if the test is both statistically valid and unidimensional).[18] Within a framework, measuring the intensity of the attitude, the answers to the succession of questions will indicate clearly that point at which the respondent's intensity of the attitude ends. It will specify the intensity, but will not integrate the dimensions into a usable synthesis.

One of the distinct advantages of the Guttman method is the reproducibility of the responses. The high proportion of responses of a large number of subjects which falls into the pattern described above is considered to be the indicator of reproducibility. Generally the degree of reproducibility should

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18 Scales are basically divided into two types, unidimensional and multidimensional. The Guttman scale claims only to be capable of measuring one segment or dimension of an attitude in any one series of questions. As we will see, this proves to be a major weakness of the Guttman scale as applied to this study.

be .90 for the statements to be approximately a perfect scale. The number of statements used is generally small, between 5 and 10, which means that the respondent need not spend hours taking the test; it is easily scored and interpreted, and the costs are minimized.

Besides the disadvantages inherent in all unidimensional scales, Guttman has given no guidelines to the selection of statements and has suggested that it be done on the basis of intuition and experience.

But, the main reason why this method of attitude measurement was not used is the weakness of unidimensional scaling. Attitudes are very complex with many variables affecting them and the variables are not even consistently applicable to all individuals. For example, the benefits of migratory birds may be approached and tested on several unidimensional scales--the economic benefits of migratory birds, the educational benefits of migratory birds, etc., or the political consequences of migratory birds. Yet, if each one of these dimensions were tested, no one of the scales would give an accurate picture of an individual's attitude toward this multidimensional benefit. Finally, one scale may be unidimensional for one group of respondents, yet not for another due to varied a priori knowledge of socio-economic factors, by, for example, farmers, hunters, or bird watchers.

Another popular form of scaling which can test the degree of favorableness of unfavorableness of an attitude is the summated

scales method of Rensis Likert. Rather than responding "yes" or "no" to each statement as in the Guttman method, the respondent is asked to rate the statement on a five point scale (strongly approve, approve, undecided, disapprove, strongly disapprove). Each response is given a numerical score; often favorable responses are scored plus and unfavorable responses scored minus. The individual's total score represents his position on the linear scale. One of the basic problems with the Likert scale is thus evident. An individual's total score does not indicate what his attitude is toward the given object, but only the favorableness or unfavorableness of his attitude toward the subject. The Likert scale does indicate whether an individual approves or disapproves of the object, but does not indicate the specifics of his attitude. This information may be sufficient and useful for certain segments of the study, but in some cases the specifics may be needed. In those areas where a composite picture will suffice, the Likert scale should prove to be quite satisfactory.

In constructing a Likert scale many statements are used on a sample group. An item analysis is then conducted to determine those statements which discriminate most clearly between the upper 25% and the lower 25% (as measured by total scores). This assures that the statements are internally consistent and will elicit responses that are not only consistent with attitudes but also easily measurable. Twenty to twenty-five statements are generally chosen to make up the test.

On a comparative basis, the Likert scale describes the

individual's attitude more effectively than the Guttman technique, due to a wider range of choices open to the respondent. It can also measure the intensity of the individual's attitude. But, as mentioned earlier, it does have serious problems in evaluating the specifics of the attitude.

Earlier in this paper, we briefly mentioned multidimensional scaling techniques. These are attempts to measure both separately and compositely the attitudes of individuals toward an object. These have been used in many ways, not the least of which having been in marketing analysis of product preferences. The similarities between the analysis of consumer demand for products and the analysis of the benefit of the resource at hand are obvious. One of the most relevant techniques within the multidimensional framework follows.

In 1957, Osgood, Suci, and Tannenbaum[19] proposed a new method of measurement which has since become a very popular research measurement tool--the semantic differential. It measures the meaning of an object to an individual, and thus the individual's attitude toward that object. The individual is asked to rate a given concept or object on a series of seven point bi-polar scales. At the end points are bi-polar adjectives representing opposite extremes of the dimensions of the attitude being measured. Through a factor analysis of these scales Osgood et al. have isolated three dimensions of the

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[19] Charles E. Osgood, George J. Suci, and Percy H. Tannenbaum, The Measurement of Meaning (Urbana: University of Illinois Press, 1957).

attitude:

1. the individual's evaluation of the object or concept being rated, corresponding to the favorable-unfavorable dimension of more traditional attitude scales;
2. the individual's perception of the potency or power of the object or concept; and
3. his perception of the activity of the object or concept.[20]

Examples of the types of bi-polar adjectives that might be used for each dimension are:

1. fair-unfair, nice-awful, valuable-worthless, good-bad;
2. large-small, strong-weak, loud-soft, wide-narrow; or
3. active-passive, fast-slow, hot-cold, ferocious-peaceful, sharp-dull.

Let us now take a moment to see how the semantic differential might be applied to this study.

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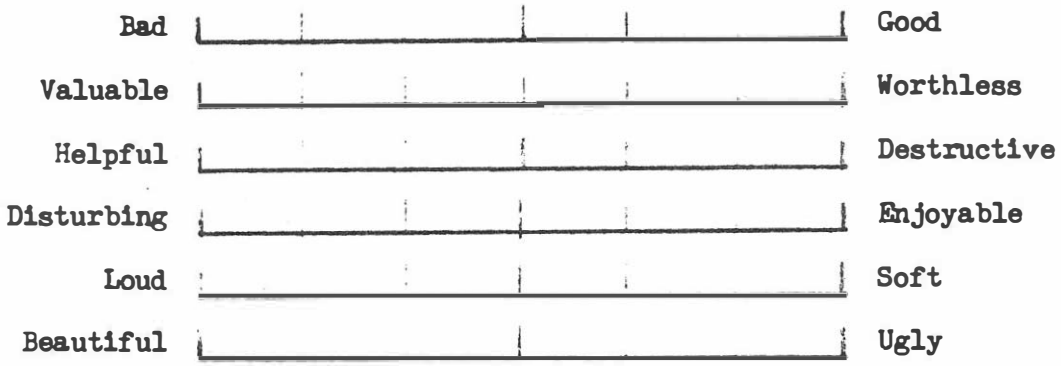
20 Claire Selltiz, Marie Jahoda, Morton Deutsch, and Sturat W. Cook, Research Methods in Social Relations (New York: Holt, Rinehart and Winston, 1951), p. 381.

Migratory Birds



By summating individual scores through factor analysis, the three dimensions of the attitude can be rated for a group. The measuring instrument has been found to be not too grossly affected by the object measured or the subject who uses the scale. Thus, subjects with different socio-economic backgrounds can be compared on the same scale.[21] This has obvious importance for this study. Since those sampled will have widely varying socio-economic backgrounds and intensities of attitudes towards migratory birds, an impartial measurement technique would be of great use.

Two entirely different approaches have been utilized by Ian McHarg.[22] In one approach, he attempts to optimize for multiple

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21 Further research and testing by many groups has substantiated this. In a recent study, an attitude survey among groups with varying interests and socio-economic backgrounds were found to be comparable. Marc Epstein and Dewey Newton, "Attitudes of High School Students Toward University Business Education - A Cross Cultural Survey," unpublished paper, University of Oregon, Eugene, Oregon, 1969.

22 Ian L. McHarg, Design with Nature (Garden City, N.Y.; The Natural History Press, 1969).

compatible land uses, rather than single uses.[23] To accomplish this, a matrix is developed with all prospective land uses as coordinates. The approach could be easily applied to the problem encountered in this study with different positive or negative benefits of migratory birds to society being the coordinates. After the coordinates are assigned, each benefit (or land use as McHarg was examining) can be tested against all others to determine compatibility, incompatibility, and possible intervening degrees.[24]

In another approach, he attempts to develop a new method for highway route selection that would use as its basic criterion, the minimum social cost.[25] In many ways the approach is similar to the basic cost-benefit analysis and has some of the same weaknesses. But, McHarg obtains value ranges for such diverse types as wildlife values (measured in terms of habitat), water values, recreational values, scenic values, and historic values. He then prepares a map for each value with color indicating its strength. Overlays are used to form a synthesis which indicates, through color, the areas

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[23] This is an attempt at measuring attitudes in a multidimensional context and solves some of the problems we encountered with the unidimensionality of the Guttman scale.

[24] McHarg, op. cit., p. 144. The matrix and the discussion immediately following might prove to be applicable.

[25] Ibid., pp. 31-41.

with the highest and lowest values in dollar terms.[26] A similar approach could be used in the migratory bird study. Value ranges could be established for each type of benefit or disbenefit, and overlays could be used to obtain a synthesis which would highlight the strongest benefits. It could also be divided into groups of users with each user group having an overlay which would be segmented into benefits. Obviously there are many other variations that could be used including proximity to flyways, urban-rural, etc. This approach, with further work and development, could prove to be another measure for the social and economic benefits and a valuable supplementary tool for the study.

Finally, it should be mentioned that of the techniques presented here, many need further investigation and development before they are useful and a pilot study is required for testing. The development of quantitative techniques for the accurate measurement of societal attitudes as applicable to the social benefits in this study has yet to take place. Through further investigation, however, it is felt that modification of the techniques presented here may yield the accurate quantification desired. It is unfortunate that the only quantification of the values to society of wildlife resources is measured by the tabulation of expenditures.

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[26] In another example of this approach, McHarg performs the same kind of analysis on city health by dividing disease into three major categories and also examining other variables such as ethnic background and economic factors. Again, he develops through the use of overlays, a synthesis which can be used for managerial decision making. See pp. 187-195.

Other models must be developed and measurement techniques utilized. Only in this way can management be provided with the information necessary for the wildlife management decision-making process.

PART 7

MEMO TO: D. Stephen

FROM: W. O. Kupsch

DATE: March 31, 1971

RE: Economic and Social Values of Migratory Birds

Now that a report on the first phase of the project on the Economic and Social Values of Migratory Birds has been submitted to you, I wish to express at this time the desire of the Institute for Northern Studies to start negotiations with Canadian Wildlife Service regarding a contract to commence work on the second phase along the lines as proposed in the report by Professors Stabler and Epstein. I am attaching a proposed budget for this study.

PART 8

BUDGET

Phase 2. Data Acquisition

Time: 2 years, commencing May 1, 1971.

Year one: Structure questionnaires and commence test runs, summer 1971. Questionnaires to hunters before start of season in September. Analyze test runs, design final questionnaires, and mail by May, 1972.

Phase 3. Data Evaluation

Time: 1 year, commencing May 1, 1973.

Analysis and preparation of reports and completion of project by May 1, 1974.

Costs

1.	Questionnaires:	preparation 5¢ mailing 10¢ 15¢			
		mail 20,000 questionnaires		$3,000	
		estimate of 25% returns 5,000 postage	8¢	400	$3,400
2.	Computer Time				500
3.	Keypunch				1,000
4.	Secretarial				1,000
5.	Interviewers, anthropologists for work in the north				7,500
6.	Project Director - 1 man for 36 months at $10,000/yr				30,000
7.	Consultant fees for designing questionnaires, dat analysis, and training interviewers				3,000
					46,400

(costs continued...)

		$46,400
8.	Travel and expenses	5,000
9.	University overhead allowance 15%	9,000
	For 3 years	$60,400

Or $20,133 per year.