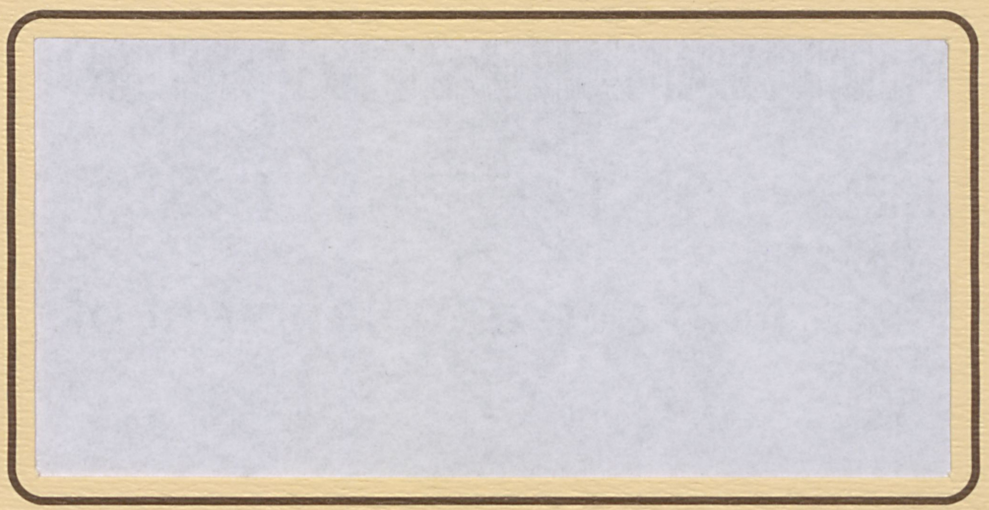
RURAL ECONOMY



STAFF PAPER

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Retention and Development of Wildlife on Private Lands:

an Annotated Bibliography

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Staff Paper No. 91-04

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FOREWORD

This paper is a by-product of an economic study of wildlife habitat on private lands in Alberta. The research project was conducted in cooperation with Alberta Fish and Wildlife Division and supported by funding from the Division and the Alberta Recreation, Parks and Wildlife Foundation. This support is gratefully acknowledged.

The results of the project, of which this paper is a supplemental part, is reported initially in a M.Sc. thesis by T.J. Haney entitled "Wildlife Habitat on Alberta Private Lands: An Analysis of Land Use Trade-Offs", Department of Rural Economy, University of Alberta, Spring 1991. There is also a companion document to this paper by T. Haney, W. Phillips and W. Adamowicz entitled "Wildlife Habitat Preservation Programs on Private Lands: A Selected Survey of Provinces, States, and Territories of Canada and the United States." Project Report 91-02, Department of Rural Economy, University of Alberta, 74 p.

The purpose of this annotated bibliography is to bring together in a single document relevant references and brief descriptions for use by researchers and the professionals with interests in wildlife habitat on private lands.

Department of Rural Economy

Annotated Bibliography

Adamowicz, W.L., T.W. Manning & W.E. Phillips. 1985. "Research Methodology and Property Rights Problems." Unpublished Paper, Dept. of Rural Economy, University of Alberta, Edmonton, Alberta.

This paper presents a proposed methodology for studying problems of property rights imbalances. The divergence of public and private interests is characterized as a primary source of conflict.

Alberta, Province of. 1989. *Land Titles Act.* Queens Printer. Edmonton, Alberta.

This Act defines all rights and privileges, both public and private, accruing from land (real property) in Alberta. This Act was last amended in 1988.

Alberta, Province of. 1984. *Wildlife Act.* Queens Printer. Edmonton, Alberta.

This Act defines all rights and privileges, both public and private, accruing from wildlife in Alberta. This Act was last amended in 1990.

Alberta Energy and Natural Resources. 1983. *Proposed Revision of The Wildlife Act.* Alberta Energy and Natural Resources. np.

This discussion paper presents Alberta's proposal for the 1983 revision of the Wildlife Act. The concepts presented include: wildlife definitions; trust funds; captive wildlife (game ranching); licensing provisions; public land management, and administration. This paper was circulated to interested parties in order to encourage public participation in the writing of the final Act.

Alberta Forestry, Lands and Wildlife. nd. *Alberta Landowner Habitat Program.* Alberta Forestry, Lands and Wildlife. Edmonton, Alberta.

This paper presents wildlife habitat loss statistics for two counties of the Parkland region of Alberta. This paper also presents descriptions, incentives, eligibility, and benefits of the pilot Landowner Habitat Program.

Alberta Forestry, Lands and Wildlife. 1989. "The Prairie Habitat Joint Venture: NAWMP Alberta Plan." Unpublished. np.

This report represents the main implementation plan of the North American Waterfowl Management Plan in Alberta. A survey of the wildlife and habitat resources is presented. Problems of agency coordination, proposed solutions, and proposed budgets are also presented.

Alberta Habitat Branch Southern Region. 1984. *A Proposal for the Integration of Irrigation System Rehabilitation with the Fish and Wildlife Resources*. Alberta Energy and Natural Resources, Fish and Wildlife Division. Lethbridge, Alberta.

This paper described habitat loss in twelve irrigation districts of Southern Alberta. The lack of coordination between wildlife and irrigation agencies was sited as a major cause of habitat declines. A process to rectify this problem was developed.

Alberta Resource Information Branch. 1990. "Parkland Habitat Change. County of Minburn". Unpublished. Edmonton, Alberta.

This paper presented the results of a digital LANDSAT survey of wildlife habitat in the County of Minburn. Changes to the habitat between 1977 and 1987 were documented.

Alberta Water Resources Commission. 1990. *Wetlands: Values and Options*. Alberta Water Resources Commission. Edmonton, Alberta.

This report presented the commission recommendations regarding the future of wetlands in the settled areas of Alberta. Specific recommendations were presented for: planning; education and awareness; wetland management, and legislative review.

Alexander, Lee, and Stephen R. Kellert. 1984. "Forest Landowners' Perspectives on Wildlife Management in New England." *North American Wildlife and Natural Resource Conference - Trans. 39th.* pp. 164-173. np.

Studies PNIF landowner responses to general scenarios concerning forest lands and wildlife. Non-consumptive and non-financial returns were primarily valued.

Anderson, A. Wayne. 1988. *Opportunity Cost Analysis of Habitat Retention in Irrigation Districts of Southern Alberta.* Dept. of Ag. Eng., University of Alberta, Edmonton, Alberta.

Farmers reclaim wetlands to improve efficiency of farming operations. Opportunity cost = Ag lease rates. More expensive for eventual irrigated cultivation; less expensive for eventual pasture, therefore less likely to reclaim methods for pasture. Highly susceptible to sensitivity analysis.

Anosike, Nnamdi, and C. Milton Coughenour. 1990. "The Socio-economic Basis of Farm Enterprise Diversification Decisions". *Rural Sociology*: 55(1), pp. 1-24.

This paper analyzed factors affecting diversification/specialization decisions. (Tenure, off-farm work, educ., enviro. variables). Based in Kentucky. An extensive theoretical (decision making) discussion was included.

Armstrong, Glen W., and William E. Phillips. 1989. "The Optimal Timing of Land Use Changes from Forestry to Agriculture." *Canadian Journal of Agricultural Economics:* 37 (1989) pp. 125-134.

This paper presented an optimization approach to land use change based on maximizing private NPV. No consideration for Non-Market values was given.

Ashby, Jacqueline A. 1985. "The Social Ecology of Soil Erosion in a Colombian Farming System." *Rural Sociology*: 50(3), pp. 377-396.

Increasing Cassava production because of increasing prices. More intense cropping because of upward returns. Small farms on poor land, cause increased erosion = f (market prices, farm structure).

Bateman, J. Tom. 1987. *The 1986 Use Respect Program.* Alberta Forestry, Lands and Wildlife, Fish and Wildlife Division. Edmonton, Alberta.

This paper presented the results of Alberta's Use Respect program. This paper highlighted attitude surveys used in research.

Batie, Sandra. 1989. "Sustainable Development: Challenges to the Profession of Agricultural Economics." *American Journal of Agricultural Economics.* 71(5), pp. 1083-1101.

Sustainable Growth was defined. Biosphere limits, and (lack of) faith in scientific and tech. progress were discussed. Aversion to environmental risks. Redistributive justice and egalitarian ethics. Downward pop. growth and investment. Goals. Intellectual history. Neoclassical Economics and S.D. concepts. (includes cost/benefit of externalities).

Batie, Sandra S., and Alyson S. Sappington. 1986. "Cross - Compliance as a Soil Conservation Strategy: A Case Study." *American Journal of Agricultural Economics*. 68(4), pp. 880-885.

Financial impacts of hypothetical cross-compliance program were presented. Compared with least-cost methods and net return from "Green Ticket/Red Ticket" compliance. Varying erosion - varying costs - varying participation were found.

Batie, Sandra S., and Carl C. Mabbs-Zeno. 1985. "Opportunity Costs of Preserving Coastal Wetlands: A Case Study of a Recreation Housing Development." *Land Economics*: 61(1), pp. 1-9.

This paper analyzed net return to development of wetlands when alternate housing development is/is not available. The development approach was studied because data is available generally.

Bean, Michael J. 1983. *The Evolution of National Wildlife Law: Revised and Expanded Edition.* Praeger Publishers. New York, New York.

This text presents the legal history and foundation of the present wildlife laws in the United States. Applications of these laws are presented as major themes of federal wildlife law. A view forward to comprehensive federal wildlife programs is also presented.

Beghin, John C. 1990. "A Game - Theoretic Model of Endogenous Public Policies." *American Journal of Agricultural Economics*. 72(1), pp. 138-148.

Public policies are the equilibrium of a cooperative game among interest groups and policy makers. This study stressed interdependence between policies and bargaining strengths. A behavioural model for bargaining was also presented. Results were applied to Senegal. Good short term predictions were achieved. No insight on structure of decision, therefore, no long-term benefit. Need good documentation on political economy.

Bell, Frederick W., and Vernon R. Leeworthy. 1987. "Economic Demand for Marinas and Projected Impact on Wetlands." *Land Economics*: 63(1), pp. 79-91.

This study used both linear OLS **and** logit to describe demand for marinas and compared results. Used simple calculations to estimate wetland demand (for conversion to dry land).

Bergstrom, John C., B.L. Dillman, John R. Stoll. 1985. "Public Environmental Amenity Benefits of Private Land: the Case of Prime Agricultural Land." *Southern Journal of Agricultural Economics*: 17(1), pp. 139-149.

Contingent valuation of environmental amenities on farmland - not fully reflected in land markets: need for public intervention. Case of urban development. Also contains a guide to survey approaches. Provides conceptual basis for researching wildlife habitat with WTP approach.

Bird, Peter J.W.N., 1987. "The Transferability and Depletability of Externalities." *Journal of Environmental Economics and Management*: 14(1), pp. 54-57.

Theoretical discussion comparing Baumol and Oates approach with compensation and Freeman's competing approach.

Blood, Tom, and John Baden. 1984. "Wildlife Habitat and Economic Institutions: Feast or Famine for Hunters and Game." *Western Wildlands*: 10 (1), pp. 8-13.

Extolling the virtues of releasing wildlife rights to private land owners. Privately managed land produces more and better game with fewer negative actions (i.e. poaching, 4WD abuse).

Boag, D., R.N. Brown, A.J. Macaulay, G.J. Mitchell, J.P. Ryder, H.L. Sawatzky, and B. Wishart. 1980. "A Canadian Paradox - Private Land, Public Wildlife: Can it be Solved." Unpublished report to the Canadian Society of Zoologists. np.

This committee report presents a broad history and overview of wildlife habitat issues in Canada. Cross-purpose government programs and economic incentives to farmers are highlighted.

Boxall, Peter C., and David O.T. Watson. 1990. "Further Investigations of Multinomial Logit Modelling of Recreational Bighorn Sheep Hunting in Alberta." Unpublished paper, Department of Rural Economy, University of Alberta, Edmonton, Alberta.

Expands linear form of Multi-Nomial Logit analysis to bighorn sheep hunting. Improved statistical fit and predictive ability. Questions independence-of-irrelevant-alternatives assumptions.

Bromley, Daniel W., 1989. "Entitlements, Missing Markets and Environmental Uncertainty." *Journal of Environmental Economics and Management*: 17(2), pp. 181-194.

Alternate compensation methods under risk. Emphasis on institutional change in general equilibrium case.

Brown, Tommy L. 1974. "Landowner Attitudes Toward Use of Lands for Recreation - A Panel." *North American Wildlife and Natural Resource Conference - Trans. 39th.* np.

This paper presents a historical perspective to land owner recreationist conflicts in New York State. Based upon the results of mail surveys, landowner attitudes toward land posting, hunting, hunters, and other recreational activities with respect to potential conflict. The study found

that landowners generally viewed public recreation on private lands as a disruption to management. Increased communication and public awareness were identified as possible solutions to conflict.

Butler, James R. 1983. "Challenges and Changing Perspectives in the Management of Fish and Wildlife Resources." *Agriculture and Forestry Bulletin*: 6(3), pp. 10-14.

Five sequential management phases were presented: 1. Protection phase, 2. Regulation phase, 3. Biological phase, 4. Ecological phase, 5. Sociological phase. Non-consumptive use is main target.

Cacek, Terry. 1988. "After the CRP Contract Expires." *Journal of Soil and Water Conservation*: 43(4), pp. 291-293.

Not all CRP programs help wildlife. Trees are most likely left for long periods - stand improvement expenses increase time in trees. Wildlife hunting lease sales are only source of income of herbacious vegetation. CRP land: Government can buy leases - value of wildlife becomes endogenous. Sunk costs in trees cause landowners to maintain land after CRP expires.

D.A. Westworth & Associates Ltd. 1990. *An Evaluation of the Landowner Habitat Project*. Habitat Branch, Alberta Fish and Wildlife Division. Edmonton, Alberta.

This study presents the findings of a survey of landowners regarding their perceptions of the Landowner Habitat Program. A review of literature regarding wildlife habitat losses and other private lands wildlife habitat programs in North America is also presented.

Ducks Unlimited Canada. 1989. "Prairie Care," in *Ducks Unlimited Canada Conservation* (10)2, Winnipeg, Manitoba.

This article presented the background and objectives of Ducks Unlimited Canada's contribution to the Prairie Habitat Joint Venture. This program offers private landowners financial incentives to convert marginal croplands into permanent nesting cover, and to demonstrate wildlife

compatible farming systems. Marginal land may be acquired in fee title. Technical assistance is also offered to private landowners for a wide variety of development projects.

East, Gordon. 1983. "Help for Landowners" in *Colorado Outdoors.* np.

This article provided a chronological history leading to the development of Colorado's landowner preferential big game hunting license program, and Colorado's trespass regulations.

Environment Council of Alberta, Renewable Resources Sub-Committee. 1989. *A Place for Wildlife.* ECA89-PA/CS-S12. Environment Council of Alberta. Edmonton, Alberta.

This paper presented an overview of wildlife's relationship to Alberta. Economic significant, management, land use interaction, and sustainable use were all presented and analyzed.

Ervin, David E., and Michael R. Dicks. 1988. "Cropland Diversion for Conservation and Environmental Improvement: An Economic Welfare Analysis." *Land Economics*: (64)3, pp. 257-268.

This study used welfare contingent evaluation estimations and large supply models to estimate social cost of programs in a conceptual approach.

Esseks, J. Dixon, and Steven E. Kraft. 1986. "Landowner Views of Obstacles to Wider Participation in the Conservation Reserve Program." *Journal of Soil and Water Conservation*: 41(6), pp. 410-414.

Perception of soil erosion problem on own land was found to be the most important explanatory variable for bidding in land. Other variables included: believe land ineligible, rent too low, 10 years too long, can't hay or graze, make more money by farming, don't know about special (corn) incentives.

Ewaschuk, E. 1989. "White tailed Deer Habitat Loss in WMU 238 (1975-1987)". Unpublished. Habitat Branch, Alberta Fish and Wildlife Division, Edmonton, Alberta.

The loss of White tailed deer habitat was documented in this paper for two wildlife management units in the parkland district of Alberta. General effects on the deer carrying capacity were also presented.

Ewaschuk, E., and D.A. Westworth. 1983. *An Evaluation of the Red Deer County Habitat Retention on Private Land Program*. Alberta Fish and Wildlife Division, Edmonton, Alberta.

This project report presents the results of a review of Alberta's first private lands habitat preservation pilot project. Previous habitat losses were reported. Recommendation for future pilot projects were given.

Filion, F.L., S. Parker, and E. DuWors. 1988. *The Importance of Wildlife to Canadians: Demand for Wildlife to 2001*. Minister of Supply and Services Canada. np.

This paper is based upon a 1981 survey of 100,000 Canadians over the age of 15. Demographic and economic trends are used to estimate future demand for wildlife related activities.

Filion, F.L., E. DuWors, A. Jacquemot, P. Bouchard, P. Boxall, P. Gray, and R. Reid. 1989. *The Importance of Wildlife to Canadians in 1987: Highlights of a National Survey*. Minister of Supply and Services Canada. np.

This paper is based on a 1987 survey of 55,173 Canadians. Comparisons to a 1981 survey are made. The involvement of Canadians in wildlife based recreation activities is studied and presented.

_____ 1990. *The Importance of Wildlife to Canadians in 1987: The Economic Significance of Wildlife-Related Recreational Activities.* Ministry of Supply and Services, Canada. np.

This paper presents the economic benefits of recreational activities, and the personal value of wildlife related recreational values in Canada. The results of this paper are meant to provide an incentive for public wildlife conservation activities.

Gould, Brian W., William E. Saupe, and Richard M. Kleume. 1989. "Conservation Tillage: The Role of Farm and Operator Characteristics and the Perception of Soil Erosion." *Land Economics*: 65(2), pp. 167-182.

Probit analysis of adopt/not adopt conservation decision was studied. Tobit analysis of intensity within adoptor group was also studied. Dependant variables for each analysis were described.

Great Plains Wildlife Services Inc. 1986. "Evaluation of Approaches to Habitat Retention/Preservation Programs in the Prairie Pothole Region of the United States." Unpublished. Jamestown, North Dakota.

This study was based upon a survey of private and public land wildlife habitat programs in North America. Specific guidelines to the development of a program in Alberta are presented. Sources included the advice from existing habitat program managers. Results were presented in the form of quotes from program managers, and the author's summations.

Griswold, Jerry R. 1987. "Conservation Credit: Motivating Landowners to Implement Soil Conservation Practices through Property Tax Credit." *Journal of Soil and Water Conservation*: 42(1), pp. 41-45.

This study was based in Wisconsin. A $3.00 per acre property tax reduction was offered to farmers who control **all** erosion on farm. Tax incentives were paid for by non-participants. Farmers chose own conservation techniques.

Hahn, Robert W. 1989. "A New Approach to the Design of Regulation in the Presence of Multiple Objectives." *Journal of Environmental Economics and Management*: 17(2), pp. 195-211.

A detailed theoretical description of a permit trading mechanism to balance multiple objectives was studied. Could be applied to wildlife, but may not be socially acceptable.

Haney, T., W.E. Phillips, and W. Adamowicz. 1991. "Wildlife Habitat Preservation Programs on Private Lands: A Selected Survey of Provinces, States, and Territories of Canada and the United States". Project Report 91-02. Department of Rural Economy, University of Alberta, Edmonton, Alberta.

This study presents the regulations, regulatory bodies, regulating actions, and preservation programs conducted by States, Provinces, and Territories in Canada and the United States.

Hatley, Michael L., R. Terry Ervin, and Bob Davis. 1989. "Socio-economic Characteristics of Participants in the CRP: Texas High Plains." *Journal of Soil and Water Conservation*: 44(5), pp. 510-512.

This study related age, tenure, occupation, education, organizational structure, and size of holdings to CRP participation. Chi square test of independence was used most heavily.

Hefferman, William D., and Gary P. Green. 1986. "Farm Size and Soil Loss: Prospects for a Sustainable Agriculture." *Rural Sociology*: 51 (1), pp. 31-42.

Farm size was found not to be related to soil erosion. Direct parallel to government paying opportunity cost to landowners who decrease acreage in erodible crops.

Heimlich, Ralph E. 1986. "Agricultural Program and Cropland Conversion, 1975-1981." *Land Economics*: 62(2), pp. 174-181.

Removing government support for highly erodible lands would remove an incentive to develop these lands but would not affect soil erosion (total) greatly. A budget/finance approach was used to estimate the variance of returns.

Huffaker, Ray G., James E. Wilen, B. Delwork Gardner. 1989. "Multiple Use Benefits on Public Rangelands: An Incentive-Based Fee System." *American Journal of Agricultural Economics*, 71(3), pp. 670-678.

A grazing fee system induced multiple use compliance through incentives. (Upward fees cause upward grazing pressures). This paper described the 1978 Public Rangeland Improvement Act. Enrollment was limited only to "Exemplary range management practices". Addressed property rights of increasing wildlife population vs. "offsetting fee system". Profit maximization was used as the decision tool. Hamiltonian solution (MRAP) was presented.

Jackson, Robert M., and Raymond K. Anderson. 1982. "Hunter-Landowner Relationship: A Management and Educational Perspective." *North American Wildlife and Natural Resource Conference - Trans. 47th.* np.

This paper presented the findings of surveys of 218 landowners in selected Wisconsin Deer Management Units. The primary source of landowner-hunter conflict was reported by landowners to be unauthorized access on private lands. Wildlife managers reported that poaching was the primary management problem.

Jahn, Laurence R. 1988. "The Potential for Wildlife Habitat Improvements." *Journal of Soil and Water Conservation*: 43(1), pp. 67-69.

CRP may succeed because of link to farm policies, but 60% of farms are small and don't currently participate. The Program must target the group. CRP may assist North American Waterfowl Management Plan. Benefits (economic) were recognized by farmers and government.

Kirby, Samuel B., Kenneth M. Babcock, Steven L. Sheriff, and Daniel J. Witter. 1981. "Private Land and Wildlife in Missouri: A Study of Farm Operator Values." Wildlife Management on Private Lands Conference: 3-6 May 1981, Milwaukee, Wisconsin.

Survey questions were presented. Tax considerations were preferred form of assistance. Seeds, advice and plants were all good incentives. Cash payments rated quite low. Idea of wildlife for profit was foreign. Trespass fees uncommon. Farmers thought their food and cover conditions were better than they really were, therefore education was needed.

Knight, Thomas O., S.R. Johnson, and Robert M. Finley. 1987. "Extension Program Evaluation Using Normative Decision Models." *American Journal of Agricultural Economics*: 69(2), pp. 338-348.

Program evaluation (extension) using a cost effective normative approach was found to be consistent with decision theory. Decreasing costs caused increasing program review which caused increasing program quality. Study used Bayes theories to estimate action.

Kraft, Steven E., and J. Dixon Esseks. 1988. "Why Eligible Landowners Did Not Participate in the First Four Sign-ups of the Conservation Reserve Program." *Journal of Soil and Water Conservation*: 43(3), pp. 251-256.

This study included a good game section. A logit analysis of telephone interviews was completed. Landowners incorrectly perceived themselves to be ineligible. They didn't know per-acre rent and were unaware of corn acreage bonuses. More outreach and $10/acre increased rents were estimated to increase participation.

Lambert, Charles D., Paul K. Kelley, and Barry L. Flinchbaugh. 1989. "Farm Operator Characteristics: Implications for Policy." *North Central Journal of Agricultural Economics*: 11(2), pp. 265-276.

This paper examined the selection of explanatory variables to study structure of Ag-Policy. Policy impacts were discussed.

Lee, Randy. 1983. *A Comparison and Evaluation of Wildlife Habitat Trends in Two Irrigation Districts in Southern Alberta (1975-1981).* Alberta Energy and Natural Resources, Fish and Wildlife Division, Lethbridge, Alberta.

This paper documented wildlife habitat changes in the Lethbridge Northern and Eastern Irrigation Districts for the period 1975 to 1981.

Lynne, Gary D., J.S. Shonkwiler, and Leandro R. Rola. 1988. "Attitudes and Farmer Conservation Behaviour." *American Journal of Agricultural Economics*, 70(1), pp. 12-19.

This paper presented model questions for conservation beliefs.

Manning, E.W.. 1983. *Agricultural Land Protection Mechanisms in Canada.* Environmental Council of Alberta. Edmonton, Alberta.

This report presented regulatory activities of the federal government and various provincial governments directed at the preservation of agricultural lands in Canada. Non agricultural use of land (i.e. urban sprawl) was specifically addressed.

Morgan, John P. 1985. "An Analysis of Landowner Attitudes Toward Techniques of Wetland Preservation in the Prairie Pothole District of Manitoba." Unpublished Masters Thesis, Dept. of Agricultural Economics and Farm Management, University of Manitoba, Winnipeg, Manitoba.

This paper was based on a survey of 50 landowners in Southwestern Manitoba. Summaries of farming size and techniques, habitat preservation activity, and landowner attitudes toward alternative preservation program options were presented.

Mason, Robert, Larry Boersma, and G. David Faulkenberry. 1988. "The Use of Open and Closed Questions to Identify Holders of Crystallized Attitudes: The Case of Adoption of Erosion-Control Practices among Farmers." *Rural Sociology*: 53 (1), pp. 96-109.

The purpose of this study was to obtain better measurements of attitude and behaviour consistency in sample survey data. Third party observation of erosion control activities prior to completion of survey was needed.

Miller, Robert D., David L. Urich, and Russell C. Mills. 1986. "A State and Federal Partnership for Soil and Wildlife Conservation." *Journal of Soil and Water Conservation*: 41(1), pp. 81-84.

This study investigated levels of cooperation including data, training, targeting, demonstration farms, monitoring, between agencies. Private land specialists were used to promote habitat concerns with conservation farming projects.

Miller, R.J. 1971. "An Economic Evaluation of Alberta's Sport Hunting and Fishing Resources." Unpublished M.Sc. thesis, Dept. of Rural Economy, University of Alberta, Edmonton, Alberta.

The purpose of this study was to determine social net benefits. Market and extra-market benefits were studied. Social benefits were found to be greater than social costs. Further research was indicated.

Miranowski, John A., and Ruth Larson Bender. 1984. "Agricultural Management Practices and Wildlife-Related Recreation: Pheasant Hunting Recreation in Iowa." *North American Wildlife and Natural Resource Conference - Trans. 49th.* pp. 325-333. np.

This study developed a framework to assess the economic impact of Agricultural Management practices on wildlife habitats, and to determine effect on pheasants. Socio-economic and hunting variables were used to describe hunting decisions.

Moncrieff, P.M. 1972. "Alternative Land Uses in Southwestern Alberta: A Study in Natural Resource Economics." Unpublished M.Sc. Thesis, Dept. of Rural Economy, University of Alberta, Edmonton, Alberta.

Through integrated land management policies, social and private returns from land could be increased.

McSweeny, William T., and Randall A. Kramer. 1986. "The Integration of Farm Programs for Achieving Soil conservation and Nonpoint Pollution Control Objectives." *Land Economics*: 62(2), pp. 159-173.

Using a net return and mean-variance analysis, the effectiveness of cross-compliance was analysed. Producer risk aversion became significant.

Nelson, Jeffery W. 1989. *The Duck Depression of the 1980s - An Agenda for Recovery.* Ducks Unlimited Inc. Long Grove, Illinois.

This report presented the background physical causes of recent duck population decreases in North America. Suggested actions to reverse this decline included: restoration of small wetlands; enhance upland cover; agricultural extension; nonbreeding management; enhance wintering wetlands; landowner incentives, and; other cooperative programs.

Nielson, James. 1986. "Conservation Targeting: Success or Failure." *Journal of Soil and Water Conservation*: 41(2), pp. 70-76.

Ten suggested improvements to targeting were presented. National planning with local flexibility was indicated for widely varying adoption factors. More local "board" level involvement was suggested.

Norris, Patricia E., and Sandra S. Batie. 1987. "Virginia Farmers' Soil Conservation Decisions: An Application of Tobit Analysis." *Southern Journal of Agricultural Economics:* 19(1), pp. 79-90.

Analysis of two surveys concluded that financial factors (income and debt) were the most important factors in conservation decisions. Age, race, and erosion potential also influenced conservation tillage use.

Nowak, Peter J. 1987. "The Adoption of Agricultural Conservation Technologies: Economic and Diffusion Explanations." *Rural Sociology*: 52(2), pp. 208-220.

This study combined economic and extension factors to explain conservation adoption.

O'Leary, Dennis, and Dave Downing. 1990. "Eastern Irrigation District: An Analysis of Wetland Habitat Change - Volume 1". Unpublished. Edmonton, Alberta.

This paper presented the findings of a four year study (1984-1987) which documented wildlife habitat changes in the Eastern Irrigation District of Alberta.

Olson, Lars J. 1990. "Environmental Preservation with Production." *Journal of Environmental Economics and Management*: 18(1), pp. 88-96.

Unambiguous bias toward preservation was not found when the environment produced non-consumptive value and when it was a production input. This situation was not mitigated with independent learning.

Orazem, Peter F., Daniel M. Otto, and Mark A. Edelman. 1989. "An Analysis of Farmers' Agricultural Policy Preferences." *American Journal of Agricultural Economics*: 71(4), pp. 837-846.

This study presented an analysis of attitudes to competing agricultural policies. Socio-economic explanatory variables were used with a multivariate regression. Farmer's financial situation strongly influenced choice of policy.

Porter, Richard C. 1988. "Environmental Negotiation: Its Potential and its Economic Efficiency." *Journal of Environmental Economics and Management*: 15(2), pp. 129-142.

This study satisfied conditions necessary for economic efficient negotiated settlements of development proposals. The approach was hypothetical.

Purdy, Ken G. nd. "Landowners' Willingness to Tolerate White-Tailed Deer Damage in New York: An Overview of Research and Management Response." Dept. of Nat. Res.: Cornell Univ. Ithaca, N.Y.

Regional differences were found to occur. Re-sampling farmers to detect "sociological" tolerance threshold to increased population was required to meet multiple goals.

Robinson, Ann Y. 1989. "Conservation Compliance and Wildlife." *Journal of Soil and Water Conservation*: 44(1), pp. 44-46.

Conservation compliance (*CRP, Sodbuster*, Swampbuster, and Conservation easements) may increase habitat quantity and quality (Decrease erosion and increase water quality). If farmers were aware of requirements, they would dual manage land for erosion control and wildlife habitat improvement.

Runge, C. Ford. 1987. "Induced Agricultural Innovation and Environmental Quality: The Case of Groundwater Regulation." *Land Economics*: 63(3), pp. 249-258.

This opinion paper suggested that Engle's & Rutan's laws cause land withdrawal programs to succeed in North America. Environmental quality concerns were suggested to be as important as quantity concerns.

Ryder, J.P., D.A. Boag. 1981. "A Canadian Paradox - Private Land, Public Wildlife - Can it be Resolved." *The Canadian Field Naturalist*. 95, pp. 35-38.

This paper presented in general terms, the conflict between economic goals of private land ownership and social goals of public wildlife ownership in Canada. Various incentives to balance these rights were discussed. The lack of coordination between public fish and wildlife agencies, and public policy makers was highlighted. Recommendations include: inclusion of unimproved land for Wheat Board quota calculation; income and property tax incentives for wildlife habitat preservation, and preservation of private access fees for consumptive and non-consumptive purposes.

Saliba, Bonnie Colby, and Daniel W. Bromley. 1986. "Soil Management Decisions - How Should They Be Compared And What Variables Influence Them." *North Central Journal of Agricultural Economics*. 8(2), pp. 305-317.

This study used logit analysis to estimate erosion control activities, weighted by erodibility of soil (USLE method).

Saskatchewan Department of Tourism and Renewable Resources. 1978. *A Survey of Farmer Attitudes Toward Wildlife, Habitat Retention, and Hunting in Saskatchewan*. Saskatchewan Department of Tourism and Renewable Resources. np.

This report presented the results of 1,300 personal interviews with private landowners in Saskatchewan, south of the Northern Provincial Forest. Landowner responses were summarized and presented under the headings: The Farmer and his Land; The Farmer and Wildlife; The

Farmer and Hunters, and; Farmer Options on Solution of Problems. Hunter access problems were cited as a major disincentive to wildlife habitat preservation and enhancement.

Scarth, Jonathan St. Clar. 1983. *A Review of Private Land Habitat Programs.* (Technical Report 83-11). Manitoba Department of Natural Resources. Winnipeg, Manitoba.

This study presented the results of a 1982 telephone survey of North American fish and wildlife agencies. Activities of those states preserving wildlife habitat through: acquisition; limited use agreements; technical assistance; public hunting; commercial hunting; property tax incentives; income tax incentives; regulatory approaches, and; land use programs were analyzed. Alternative funding methods were also investigated.

Setia, Parveen P., and C. Tim Osborn. 1989. "Targeting Soil Conservation Incentive Payments." *North Central Journal of Agricultural Economics:* 11(1), pp. 95-103.

Substantial net savings were estimated by targeting and recognizing productivity impacts. When "Blanket" a subsidy was offered, only least erodible soils will be excluded.

Sheriff, Steven L., Daniel J. Witter, Samuel B. Kirby, and Kenneth M. Babcock. 1981. "Missouri's Landowners: How They Perceive the Importance of Wildlife." *North American Wildlife and Natural Resource Conference - Trans. 39th.* Wildlife Management Institute, Washington. DC.

Conservation agencies must work toward cooperating with landowners to meet their requirements and concerns - "Cooperation and Communication".

Shoemaker, Robbin. 1989. "Agricultural Land Values and Rents Under the Conservation Reserve Program." *Land Economics*: 65(2), pp. 131-137.

A finance approach found that increased cash returns to land causes increased land values (capitalized annuity). Regions were affected differently.

Snipe, J.H. 1970. "The Ecological and Economic Impact of Water Resource Development in Southern Alberta: The Case of Fish and Wildlife." Unpublished M.Sc. Thesis. Dept. of Rural Economy, University of Alberta, Edmonton, Alberta.

This study investigated the ecological and economic impacts of development in Southern Alberta. Decreasing fish population had been an important resource loss. Increasing private landowner compensation may improve fish and wildlife resources.

Stoll, Robert J., and Gregory L. Monty. 1983. *Rural Landowner Attitudes Toward Deer and Deer Populations in Ohio.* Ohio Department of Natural Resources, Division of Wildlife. Columbus, Ohio.

This paper presented the results of a survey of 5246 private landowners in Ohio. Attitudes toward deer depreciation, wildlife habitat programs, desirable deer densities and hunter conflict were presented and analysed.

Svoboda, Franklin J. 1984. "Minnesota Landowner Attitudes Toward Wildlife Habitat Management." *North American Wildlife and Natural Resource Conference - Trans. 49th.* pp. 154-158.

Virtually all land use managers were found to be wildlife managers by default.

Taff, Steven J. 1988. "Minnesota's RIM Reserve: How Does it Stack Up Against CRP?" *Journal of Soil and Water Conservation*: 43(1), pp. 82-84.

This study highlighted differences between RIM and CRP. RIM program goals included wildlife and agriculture value. RIM used multi-level targeting, and was more efficient. RIM used easements (more substantial) for property rights acquisition.

Turner, Bruce C., and F. Dale Caswell. 1989. "Waterfowl Population and Habitat Status." Sixth International Waterfowl Symposium. Washington, D.C.

This study presented methods and results of investigations of the long-term relationship of waterfowl populations and habitat within the surveyed areas of Canada. The continental mallard population was found to be correlated to the number of "July" ponds. The overall waterfowl productivity of the prairie-parkland region was found to be impaired. "Identification of the factors which have caused waterfowl habitat loss is but the first step in resolving the problem."

Turner, Bruce C., George S. Hochbaum, F. Dale Caswell, and Daniel J. Nieman. nd. "Agricultural Impacts on Wetland Habitats on the Canadian Prairies, 1981-85." np.

This paper documented the agricultural impacts on 10,000 monitored water basins and margins in the prairie-pothole region of Canada. Possible causes of the continued agriculture expansion were presented.

United States Department of Interior, and Environment Canada. 1986. *North American Waterfowl Management Plan*. Minister of Supply and Services Canada. np.

This agreement presented the principles and objectives of the NAWMP. Habitat preservation and habitat priorities and goals were presented. The structure of implementation was also presented.

Usher, R. and J. Scarth. 1990. *Alberta's Wetlands: Water in the Bank!*. ECA90-PA/CS-514. Environment Council of Alberta. Edmonton, Alberta.

This discussion paper presented a comprehensive view of Alberta's wetlands, in order to analyze competing land uses. A review of existing federal and provincial legislation suggested a large degree of contradiction resulting in many cross purpose objectives.

Van Kooten, G.C. and Andrew Schmitz. 1990. *Socio-economic Evaluation of Incentives to Promote Waterfowl Habitat: Prairie Pothole Project Extensive Survey Results.* Saskatchewan Department of Parks, Recreation and Culture. Regina, Saskatchewan.

This paper investigated whether the level of incentive payments offered landowners was sufficient to offset the cost of changing agronomic practices necessary to preserve waterfowl habitat in Saskatchewan.

Van Kooten, G.C., Richard A. Schoney, and Keith A. Hayward. 1986. "An Alternative Approach to the Evaluation of Goal Hierarchies Among Farmers." *Western Journal of Agricultural Economics:* 11(1), pp. 40-44.

Use of Fuzzy Pair-Wize comparisons allowed farmers to indicate preference between two alternate goal statements. This increased goodness of fit of the selected mode. Better fit was produced than single objective decision models. Risk and returns goals were analyzed.

Variyam, Jayachandran N., Jeffery L. Jordan, and James E. Epperson. 1990. "Preferences of Citizens for Agricultural Policies: Evidence from a National Survey." *American Journal of Agriculture Economics.* 72(2), pp. 257-267.

Preferences of individuals to government financial support to farmers were studied. Explanatory variables included socio-economic and regional data. Findings indicated initial support for aid, decreased support with increasing prices, and the existence of regional differences.

Veeman, Terrence S., Wiktor L. Adamowicz, and William E. Phillips. 1989. *A Canadian Conservation Reserve Program: An Economic Perspective.* Staff Paper 89-12, Department of Rural Economy, University of Alberta, Edmonton, Alberta.

This paper presented the background and proposed components of a Canadian Soil Erosion control program. Similarities between this reserve program and the current wildlife reserve program offered in Alberta were highlighted. Coordination between soil erosion and wildlife habitat concerns were noted.

Willis, K.G., J.F. Benson, and Caroline M. Sanders. 1988. "The Impact of Agricultural Policy on the Costs of Nature Conservation." *Land Economics*: 64(2), pp. 147-157.

This study quantified the social and financial "cost" of wildlife conservation through decreasing cultivation in the U.K. Great care was taken with pricing (net of subsidies) of outputs and (world price) of inputs.

Witter, Daniel J., Wayne R. Porath, Steven L. Sheriff, and Norbert F. Giessman. nd. "Balancing Landowner Privilege and Public Recreation in Missouri Deer Management". *North American Wildlife and Natural Resource Conference - Trans. 52nd.* np.

The option of free hunting (no permits) to landowners for "in-season" take was studied. Increased permits for large holdings was made contingent upon increased food and cover.

Young, C. Edwin, and C. Tim Osborn. 1990. *The Conservation Reserve Program.* Agricultural Economic Report Number 626. USDA: Economic Research Services, Washington, D.C.

The CRP was found to increase net farm income and increase environmental quality at the cost of government administration, input sectors, increased food costs, and other local economic activity.