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BY
H. W. HERBISON, PROFESSOR EMERITUS
DEPARTMENT OF AGRICULTURAL ECONOMICS
AND
NORTH DAKOTA WATER RESOURCES INSTITUTE
COOPERATING

A PROGRESS REPORT
on aspects of
North Dakota Wetlands Use
and Management

* * *

DEPARTMENT OF AGRICULTURAL ECONOMICS
AGRICULTURAL EXPERIMENT STATION
NORTH DAKOTA STATE UNIVERSITY
OF AGRICULTURE AND APPLIED SCIENCE
FARGO, NORTH DAKOTA

PREFACE

This study is a result of requests from interested individuals and organizations who have been involved in discussion and controversy regarding the use of our wetlands. The major source of demand came from people connected with the Devils Lake Watershed's Sweetwater-Dry Lake Water Management District.

The study does not pretend to be all encompassing, but rather, it is a brief over-view of the problem emphasizing the Sweetwater-Dry Lake Water Management District in an attempt to provide some guidelines on certain aspects of wetlands use and management.

Mr. H. W. Herbison, upon retirement, accepted the responsibility of reviewing the problem and of making a progress report indicating some of the aspects of the problem. Professor Jerome E. Johnson and Professor Thor A. Hertsgaard reviewed and edited the manuscript and provided valuable contributions in putting it in its present form.

The study was supported, in part, by the North Dakota Water Resources Research Institute with funds provided by the Department of Interior, Office of Water Resources Research under P.L. 88-379.

The Department of Agricultural Economics hopes that the study will help provide some guidelines to the overall problems of North Dakota's Wetlands Use and Management.

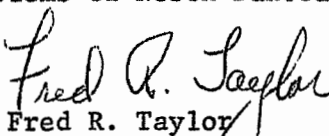

Dr. Fred R. Taylor
Chairman

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A PROGRESS REPORT ON ASPECTS
OF
NORTH DAKOTA WETLANDS USE AND MANAGEMENT

PART I

THE PROBLEM SITUATION

This inquiry was undertaken to find, test, assemble, and disseminate information contributing to better public understanding and to the solution of problems related to the use of potholed prairie sectors of certain North Dakota watersheds. The project included (1) identification, clarification, and analysis of problems of major economic significance to North Dakota and its water management districts, and (2) assembly of information for the solution of these problems, including cumulative cost of inaction.

Complementary liaison with federal, state, and local leaders involved with wetlands utilization provides a timely opportunity for coordinating the resources of several agencies to help local water management districts translate sound planning into early concerted action needed for such goals as:

(1) Development of feasible facilities and/or practices needed for timely control of intermittent floods and sheetwater excesses to permit optimum use of valuable croplands;

(2) Preservation of Type 3, 4, and 5 wetlands as a responsible potholed prairie farmland management program in North Dakota;

(3) Practical mitigations to offset the loss of Type 3, 4, and 5 wetlands damaged or destroyed by construction and use of facilities needed for economic control of floods and excess sheetwater intermittently drained from valuable area croplands;

(4) Feasible outdoor water recreation facility development, as needed;

(5) Revised mapping of area wetlands, with special reference to technical identification in place of Type 1, 2, and 3 wetlands, in place; and

(6) Practical working liaison or supervisory coordination among the several water resource and wetlands utilization programs in effect within the district or watershed.

The Devils Lake Watershed's Sweetwater-Dry Lake Water Management District provided laboratory environment for inquiry into problems arising from economic needs of farmers for modern flood control and excess sheetwater drainage from valuable croplands and the desire of wildfowl interests to maintain "the status quo" with respect to wetlands useful to waterfowl within the heartland of North Dakota's potholed prairie country. Solutions suggested included:

(1) Construction of a Sweetwater-Dry Lake floodwater reservoir and service facility linked by a controlled drainage channel to Devils Lake, as recommended by North Dakota's State Water Commission, and others:

(2) Mitigation of valuable waterfowl habitat necessarily destroyed or damaged by construction of the reservoir and channel;

(3) Drainage of intermittent floods and sheetwater excesses from valuable croplands;

(4) Approximately 75 per cent to near-maintenance of Type 3, 4, and 5 wetlands as natural waterfowl habitat on privately owned farmlands, through combined use of voluntary "district" or "Federal" easements;

(5) Development of a "Cavanaugh Lake" Outdoor Water Recreation potential, and other feasible water recreation areas;

(6) Cooperative development and testing of new waterfowl habitat management and propagation technologies to improve efficiency of scarce wetlands use; and

(7) Prompt reclassification and mapping of Type 1, Type 2, and Type 3 wetlands by competent soils technicians.

The Sweetwater-Dry Lake Water Management District has much in common with North Dakota's total potholed prairie watershed complex lying east of the Missouri River. Geographically, it is centered within the nation's best known migratory waterfowl flyway and game duck production area. Its undulating, fertile croplands are used mainly for production of high-yielding, premium quality wheats, malting barley, and flaxseed.

A Descriptive Classification of Dakota Prairie Wetlands

Wetlands, commonly associated with migratory waterfowl accommodation or as potential croplands in potholed prairie sectors of the Dakotas and western Minnesota, generally are those lands holding from three inches to not more than 10 feet of water above ground level for significant periods of time during a normal precipitation year. What is "normal;" and what is "significant" are difficult to define.

Soils technicians classify wetlands into five broad categories, in order of their propensity to hold water above ground level. Types 1 and 2 are temporary wetlands following spring snowmelts or heavy rainfalls; Types 4 and 5 are nearly permanent wetlands. Types 1 and 2 wetlands provide only temporary accommodation for pairs of breeding game ducks during their spring-time courtship, and are normally highly productive croplands; Type 4 and 5 wetlands provide prime spring and summer accommodation for game ducks, but yield only marginal crop returns.

For practical purposes, potholed prairie wetlands may be typed and classified as follows:

Type 1 wetlands consist of shallow, readily drainable depressions holding surface water but for a few days or weeks duration, and at most, following spring snowmelt and heavy rainfalls. These are wetlands integrally associated with much of North Dakota's "excess sheetwater complex" on nearly level to undulating croplands found east of the Missouri River.

Type 2 wetlands tend to hold reservoired surface or excess sheetwater a little longer in the absence of adequate flood and excess sheetwater drainage facilities needed for economic management of these croplands. Like Type 1, their contribution to waterfowl accommodation is temporary providing short-run environmental privacy for pairs of game ducks during the early springtime courting-nesting season. Freedom from waterlogged soils, plus opportunity to cultivate and plant such areas to cash crops in season, is indicative of Type 2 wetlands, sometimes confused with more permanent Type 3 wetland areas.

Type 3 wetlands technically are shallow, freshwater marshes prone to hold surface water during the spring and into early summer, going dry in late July or early August most years. Type 3 wetlands provide prime natural habitat for breeding pairs of game ducks. Many type 3 wetlands with drainage, may become economically productive cash croplands over time. Type 3 becomes a highly controversial classification when, or if, easements restricting drainage or permissive use of wetlands are removed. In much of North Dakota the cumulative fill-in of silt resulting from wind erosion common to potholed prairie cropland area often gives Type 2 attributes to wetlands mapped and described as Type 3 at an earlier date. This situation often has made the distinction between a Type 2 or a Type 3 description for a given wetland area difficult to accurately delineate. The conflicts center around Type 3 wetland use.

Type 4 wetlands consist mainly of relatively deep freshwater marshes which normally hold some surface water the year around except during periods of severe drouth. These wetlands provide prime accommodation for game ducks during the spring and summer throughout North Dakota's potholed prairie country, and hold a high productivity rating in net game ducks produced for waterfowlers over time. Though drainable for cash crop production, economic benefits normally obtained from drainage actions are mostly marginal. Soils are definitely waterlogged most of the time. Maintenance of Type 4 wetlands as prime waterfowl habitat on privately owned lands makes good sense for conservation-oriented farm and wildlife management in much of North Dakota.

Type 5 wetlands consist of open freshwater areas of variable depth (normally more than three but less than ten feet in depth) surrounded by marsh vegetation. These wetlands seldom go dry except during periods of extreme and sustained drouth. The obviously are valuable as natural habitat for game duck accommodation. Maintenance of Type 5 wetlands for waterfowl accommodation on privately owned farmlands is recommended with few, if any, reservations.

Incomplete Drainage is Common to Many Areas

Major areas lying east of the Missouri River in North Dakota have incomplete drainage to facilitate timely removal of flood and sheetwater excesses

from fertile croplands following spring snowmelt and heavy rainfall. This problem affects economic returns of nearly 36,000, or 75 per cent, of the state's commercial farms in six to seven years of every decade. About 75 per cent of the state's 27½ million acres of economically productive cropland lies within this general land use area; approximately 75 per cent of the state's 17 to 18 million harvested cropland acres are on farms within the area.

Topographically, much of the area is nearly level, nearly level to gently rolling, or undulating to rolling. Shallow meandering coulees or sloughs have become silted due to chronic wind erosion of area topsoils over time. See Figure 1 - Major Soil Areas of North Dakota.

Timeliness of planting cash crops has been carefully researched and the economic consequences of delayed seeding calculated in terms of both yield and qualitative expectancies affecting economic returns. A delay of a week or more in getting crops planted in the spring, due to incomplete drainage, may reduce profit 20 to 50 per cent. Delayed seeding has been a costly problem three out of every five years in about 30 counties east of the Missouri. Approximately 10 per cent of the cropland has been subjected to delayed seeding about 60 per cent of the time by reason of incomplete drainage. In addition, damage to crops following periods of heavy rainfall has affected this same area in one of every five years through inability to carry on timely harvesting operations for lack of adequate pothole drainage of fields. Losses due to incomplete drainage for Type 1 and 2 wetlands in about 30 counties east of the Missouri would figure out to an average annual toll on North Dakota's economy of at least \$15 million in terms of income from delayed seeding over time; and the cost of incomplete drainage in terms of marketability and lost grain associated with harvesting following periods of heavy rainfall would likely average out in this same area at about \$5 million annually.

Excluding lakes, how many wetland areas, significant as waterfowl accommodation areas, lie on farms east of the Missouri River in North Dakota? Wetland areas (Types 1 to 5) numbered about 600 thousand a decade ago. This estimate may be conservative, inasmuch as many Type 1 and 2 wetlands may not have been included as natural habitat significantly accommodating migratory waterfowl.

The typical size of farm wetland areas east of the Missouri River (excluding lakes) is about one-half acre for Types 1 and 2, and one and one-third acres for Type 3.

About two-thirds of North Dakota's wetlands included in waterfowl accommodation habitat inventories of privately owned farmlands are Type 1 and 2; nearly 30 per cent are Type 3 to quasi-Type 4.

Rough deductions indicate that no less than 250,000 Type 1 and 2 wetland acres had incomplete drainage problems seriously interfering with timely planting and harvesting of cash crops as late as 1955. As of 1958, about 10 per cent of Type 1 and 2 wetland areas had been drained (assuming acreage drained as proportional to number of areas drained).

During the five-year time period 1954-1958 many Type 3 wetland areas were cropped one to three times, as drouth permitted tillage. Nearly 20 per

Figure 1. MAJOR SOIL AREAS OF NORTH DAKOTA



Nearly level to gently rolling soils with thick black surface layer and associated soils with very limy subsoil, with claypan subsoil, or wet soils.

Rolling soils with thick black surface layer and associated steeply sloping soils with thin surface layer.

Nearly level to gently rolling soils with thick dark brown surface layer and associated soils with claypan subsoil or steeply sloping soils with thin surface layer.

Undulating to rolling soils, with gray surface layer and associated soils with thick black surface layer.

Nearly level clay soils with thick black surface layer.

Nearly level to undulating soils with very limy subsoil and associated soils with thick black surface layer, wet soils or saline soils.

Saline clay loams and loams.

Nearly level soils with alkali claypan subsoil and associated non-alkali soils with thick surface layer.

Rolling, hilly and steeply sloping soils with thin surface layer and associated soils with thick surface layer or with claypan subsoil.

Badlands; rough broken land.

Hilly, hummocky and nearly level sandy soils and associated wet soils.

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cent of Type 3 wetlands might be cropped in two out of five years, and 50 per cent or more about once in five years.

The Dual Uses of the Potholed Prairies

In springtime, a traveler crossing Dakota's potholed prairie country east of the Missouri River is seldom beyond sight of game ducks or attractive farmsteads. This is some of the best farming country in the world. Here, also, exists some of the finest game duck breeding range within North America.

Though gregarious most of the year, game ducks seek to isolate themselves during the important spring nesting season, each pair endeavoring to keep separate from otherspairs of the same species. Small sloughs and potholes create a nearly ideal environmental setting for the kind of springtime dispersal breeding pairs of game ducks like best. Many thousands of small and shallow potholes, interspersed with lazily meandering shallow coulees or marshes, abound throughout most of North Dakota's potholed prairie country. Common to the level-to-gently-undulating cash crop country, shallower potholes have been looked upon by commercial farmers, who may or may not be aware of their value for duck production, as an economic nuisance to be rid of or materially reduced in number.

Estimates currently credit the Dakotas and western Minnesota with more than half of the nation's total game duck production. North Dakota ranks an easy first in game duck output among the 48 contiguous states. Contributing factors include: (1) A relatively large potholed prairie farmland area still providing much prime natural wetlands habitat for migratory waterfowl's accommodation, (2) The current geographic pattern in continental waterfowl migration routes makes North Dakota's cash crop country a favored post-harvest flyway and feeding area for North American wild geese and game ducks returning to southern wintering places, and (3) An inherent disposition of many North Dakotans to regard conservation of their natural resources heritage, including migratory waterfowl accommodation, as an integral tenet of responsible stewardship of privately owned and operated farmlands.

The nation's game duck output, in total or in this general land use area, is overshadowed by the much larger game duck production currently associated with Canada's vast potholed prairie land area.

Big water and big marshes often are associated erroneously with large duck populations without regard to complementary potholed nesting range or food supplies. Large marshland areas function mainly as attractive spring or fall gathering places, molting areas, or summer rendezvous for game ducks. But, expecting uninterrupted waterfowl production abundance from pristine marsh or lake regions in Canada's far north becomes wishful thinking. The potholes of the Dakotas and the prairie provinces are the principal waterfowl production areas.

North Dakota: Way Station for Continental Waterfowl in Flight

Each spring North American game ducks and wild geese leave their southern wintering quarters to return to natural breeding areas located mainly

within our northern states or Canada's territories and prairie provinces. Each fall a reverse migration takes place. About two-thirds of North America's migratory waterfowl currently use potholed prairie farmland accommodations of the Dakotas and western Minnesota each spring and fall. Research indicates that waterfowl are prone to return to breeding areas, resting spots, feeding grounds, and wintering places previously visited.

Waterfowl migration involves a well-defined system of flyways or geographic flight routes along which two or more species normally fly northward to preferred breeding ranges in springtime, and back again to a warm southland during fall or early winter. Technically, these flyways are comprised of several individual migration routes along which one or more species fly. There may be considerable overlap in flyways, and in the migratory routes of given species within the major flyway. It is sufficient for our purpose to report that four major North American flyways currently regularly carry migratory waterfowl north and south over the continent (See Figure 2).

Each of the four major continental flyways has its own peculiar duck and goose populations. East to west the four major flight routings are known as the (1) Atlantic, (2) Mississippi, (3) Central, or Great Plains, and (4) Pacific flyways.

Two major continental waterfowl flyways, Mississippi and the Central or Great Plains, partially overlap or merge in crossing North Dakota. Both carry heavy concentrations of Canadian geese, mallards, pintails, and other game ducks popular with gunners. In addition, an important tributary of the main Atlantic flyway crosses prairie farmlands located within the southern half of North Dakota. This tributary begins in Utah, continuing in a north-easterly and southeasterly course to the Atlantic coast, and vice versa. Canadian geese, redhead, and canvasback ducks in large numbers follow this latter migration route each year, together with many teal and a miscellany of other game ducks prevailing wildfowlers and watchers alike a very large selection of waterfowl to enjoy.

North Dakota Wildfowling Unique Among 48 Contiguous States

Among the 48 contiguous states, North Dakota presently holds a unique position in terms of overall environmental accommodation provided migratory waterfowl, biologically and geographically. Several factors, in combination, contribute heavily to this position, among them these three:

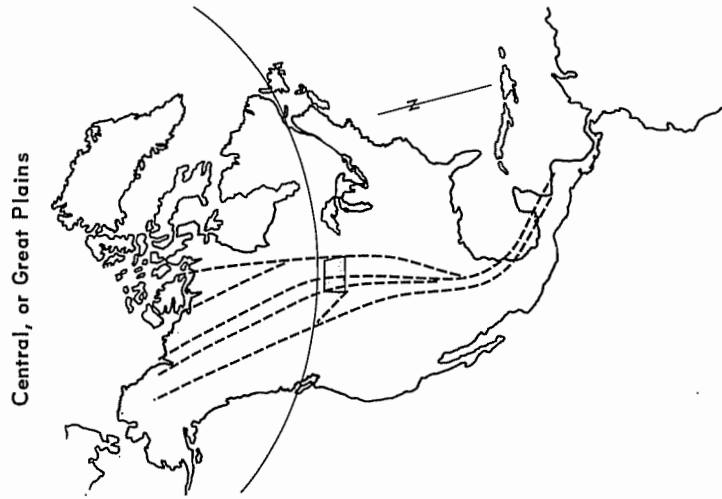
(1) Extensive potholed prairie wetland acreage;

(2) Food abundance for ducks; and

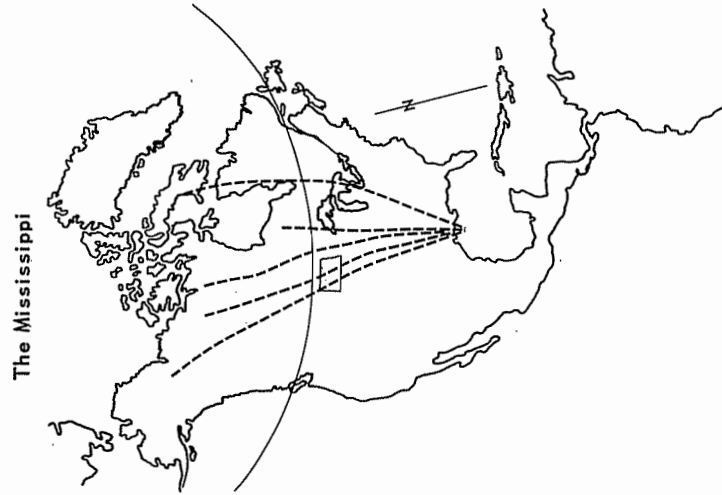
(3) A tendency for the area's commercial farmers to consider resource conservation, including waterfowl, a sound tenet of responsible farm management or land stewardship.

Other factors of importance include:

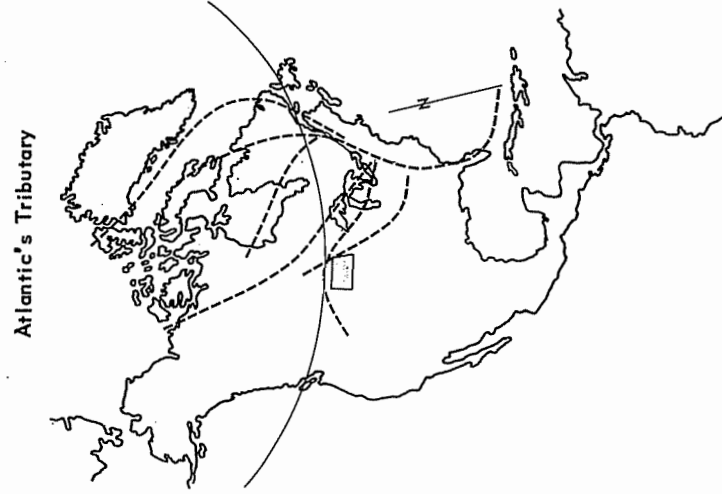
(1) Impact of national migratory waterfowl conservation policy, and its complementary wetlands acquisition programs (outright purchase, and by



Central, or Great Plains



The Mississippi



Atlantic's Tributary

Figure 2 THREE NORTH AMERICAN WATERFOWL FLYWAYS CROSS THE DAKOTAS AND WESTERN MINNESOTA ^{1/}

This flyway uses much of the Canadian and U.S. Great Plains Wheat Region. Tens of thousand ducks within this flyway's eastern sector go through the Dakotas in fall and spring. For variety as well as volume in game ducks and geese, this migratory route is unexcelled. Grain crops compete increasingly with waterfowl for use of fertile potholed prairie wetlands throughout the area.

The western section of the Mississippi flyway merges with the Central flyway in North Dakota and Manitoba. This section carries the largest waterfowl concentration in the flyway. Its main route begins in Alaska, and in the Canadian territories; its eastern boundary follows the Hudson Bay and Mississippi. The Mississippi flyway runs heavily to Canadian Geese, and to Mallard and Pintail ducks.

The Atlantic flyway links Northern Canadian and U.S. Great Lakes regions with the East Coast. It has two or more significant tributaries. One begins in Utah, moving northeast and southeasterly after crossing through North Dakota. Another links the Mississippi flyway with the East Coast migration route. Canadian Geese, Redhead and Canvasback ducks patronize this migratory route.

^{1/}Source of Reference Information: American Wildlife Institute and Manitoba Department of Natural Resources.

easement) upon the overall wetlands acreage maintained as prime accommodation for migratory waterfowl within the state;

(2) Recent administrative policy of United States Department of Agriculture and other federal agencies restricting use of public monies and/or technical assistance for economic drainage of excess flood or sheetwater from central and east central North Dakota croplands outside the purview of P.L. 566 Small Watershed Programs operative in cooperation with the North Dakota State Water Commission;

(3) State Water Commission's moratorium on wetlands drainage except by special permit from the Commission, for the Devils Lake Watershed.

There is widespread public awareness of North Dakota's abundant migratory waterfowl resources, past and present. North Dakotans, together with three to four thousand appreciative non-resident hunters, have enjoyed thrilling wild goose and game duck hunting each fall. The nation's wildfowlers are concerned with preservation or enhancement of this resource for their further exploitation and enjoyment over time. But there is need for public awareness that North Dakota's extraordinarily rich migratory waterfowl resource owes much of its past and present existence to the astute management of privately owned potholed prairie farmlands, mindful of waterfowl accommodation over time along with the business of creating needed family income from fertile croplands.

Will There be Wildfowling in 2000 A.D.?

Will there be waterfowling for our great-grandchildren to enjoy in North Dakota, and elsewhere throughout the nation, as we've known it up to now? The "good old days" for Dakota duck hunters may last for another decade or two. Expected improvement in game duck production and management technology in the future, out of research currently under way, should partially mitigate much of the projected shrinkage in wetlands maintained for game duck accommodation on North Dakota farms between now and 1985. But only a small portion of Type 1 and 2 wetlands currently accommodating courting game ducks in springtime east of the Missouri River will remain undrained a decade or so from now. The economic gain from improved timing for cash crop planting and harvesting operations on fertile croplands now chronically plagued with excess sheetwater following snowmelt and heavy rainfalls are so obvious that rational concern with improvement of the state or local business climates of the future must result in economically realistic drainage of most Type 1 and Type 2 wetlands, and soon. Perhaps there will be a 25 per cent attrition within the next decade in number and total area of Type 3 wetlands now providing prime springtime habitat for breeding pairs of game ducks throughout much of North Dakota. Modern mitigation practice may nearly offset the impact of Type 3 wetlands attrition upon the state's overall game duck propagation potential. This assumes that (a) commercial farmers remain favorably disposed toward waterfowl accommodation compatible with economic management of fertile croplands, and (b) research will improve future game duck production and management efficiency and the productivity of prime waterfowl habitat.

Assessment of game duck hunting climates likely to prevail beyond 1985 is very speculative. Game duck output may hold fairly stable even though

further attritions in prime habitat on privately owned lands take place. Hunting pressures will increase rapidly due to population growth and a more affluent modern society. Further restrictions on permissive hunting practice will be necessary. The opportunity exists for satisfactory waterfowling heritage for people to enjoy from now to 2000 A.D., or beyond, if there be a willingness to resolve basic conflicts of interest in wetlands utilization through compromise. But it is already late for reconciling practical waterfowl conservation with economic drainage of excess flood and sheetwaters in North Dakota's fertile potholed prairie country.

Dakota Goose Hunting Outlook Remains Good

The outlook for the wild goose hunter is more promising than for game duck hunters. In North Dakota and throughout most of the prairie country of Canada and the United States, there is less competition by cash crop farmers for use of wetlands accommodating wild geese. Most wild geese hunted in the potholed prairie sectors of Canada and the United States arrive from the far north following the small grain harvest in early fall to glean harvested grain fields and the greenery of clover or volunteer grain crops.

Springtime accommodation of wild geese in North Dakota hardly ever is competitive with cash crop production. Croplands are not seeded until most wild geese have gone on to nesting ranges in the far north. Marshlands used by nesting wild geese in Canada and North Dakota are not suited to economic cash grain production. Only on rare occasions does the fall migration of wild geese begin before North Dakota small grain crops are harvested; maybe one year out of five presents "waterfowl accommodation problems." Fields "picked on" by migratory flocks of wild geese get harvested by them in a hurry. Very few commercial farmers have complained about feeding wild geese in the fall compared with those who allegedly incur losses from feeding game ducks with an appetite for barley and wheat laying in swaths.

National Policy Committed to Waterfowl Conservation

The Congress has committed this nation's land, water, and related natural resource utilization policy to preservation of a waterfowling heritage for future generations to enjoy. Congress holds administrators responsible for making sure that the expenditure of public funds or use of technical program assistance provided by their agencies actually contribute to this national policy. Thus, United States Department of Agriculture agencies in North Dakota have been heavily oriented in recent years toward conservation or preservation of valuable natural waterfowl habitat held to be consistent with national wildlife conservation and related land use policy.

In the 1960's Congress has made federal monies available for strategic purchase or complementary easement-leasing of prime wetlands to maintain and augment valuable waterfowl habitat holdings (private, state, and federal) over time. These funds are to be offset or repaid to the federal treasury by the nation's wildfowlers over time through purchase of "duck stamps" to be affixed to hunting licenses issued each year.

How large should the wetlands acreage accommodating migratory waterfowl be, how strategically located, with what type mix, and about how much of the resource needs be under public ownership and/or management? In appraisal of future needs experts put the overall required wetlands acreage resource at a minimum of about 12½ million acres, assuming continuation of the existing locational mix of wetlands now accommodating waterfowl. About two-thirds of the minimal national wetlands acre complex sought might consist of wetlands already federally owned, plus other wetlands to be purchased or leased under perpetual easement out of "duck stamp" monies. Complementary wetlands owned, purchased, or leased for the accommodation of migratory waterfowl by cooperating state and local agencies concerned with perpetuation or mitigation of minimal waterfowl habitat would be expected to make up about one-third of the total 12½ million acre resource complex.

Demands of Civilization Mean Wetlands Attrition Pressures

Nationally, the changing demands of modern civilization and this nation's rapidly expanding economy had reduced an original 127 million wetlands acres in the 48 contiguous states to approximately 74 million acres in 1955. Of the 74 million acres, about 22½ million acres of prime wetland for migratory waterfowl accommodation remained available as of mid-1961. The shrinkage in wetlands since 1961 has occurred at an annual rate of about one-fourth million acres. Future attrition may continue, but at a lower rate than the "relatively slow" 1961-1966 rate.

The nation's prime wetland for waterfowl accommodation is about 21½ million acres in 1967, a large part concentrated within the river-bottomed and prairie farmlands within the Mississippi and Central flyways patronized by about two-thirds of North America's game ducks and geese in their spring and late fall migrations. There is a related concentration of the nation's prime waterfowl habitat in North Dakota's potholed prairie counties between the Missouri and Red rivers, quantitatively and qualitatively.

Thus, it is North Dakotans, particularly those residing in areas most affected by competitive uses for some of the wetlands heretofore accommodating waterfowl, who have reason to be greatly concerned with the nation's evolving waterfowl conservation policy. The wetlands acquisition program designed to help implement the national policy affects some areas of the state more than others (e.g., the Devils Lake Watershed's Sweetwater-Dry Lake Water Management District).

Cursory examination of land use program planning within the past decade would indicate that encouraging progress has been made in coping with the intricate but necessarily relevant aspects of reconciling waterfowl accommodation with economic potholed-prairie cropland management. Nationally, regionally, and locally progress has included (1) minimal waterfowl habitat preservation goals, totally and distributionally by kind, (2) practical mitigation practice facilitating economic flood control and related sheetwater drainage of valuable croplands, (3) development and use of practical voluntary wetlands easement arrangements to incur help of private landowners in maintenance of valuable natural waterfowl habitat, (4) use of on-the-spot compromised agreement as to practical wetland classification between farmer and soils technician in event

of classification controversy, and (5) a developing awareness of the cooperative role that the Soil Conservation Service and North Dakota's Water Conservation Commission may play in assisting local water management districts with a unified wetland utilization program.

A Meeting of Minds May Help Preserve A Heritage

Strenuous and continuing efforts by wildfowling enthusiasts to halt or impede a drainage of Type 1 and 2 wetlands now accommodating game ducks temporarily in springtime has not helped reconcile the complex problem of public and private interests in North Dakota's privately owned and operated potholed prairie farmlands the past 12 to 15 years. There are limits beyond which patience of conservation-oriented farm managers cannot be stretched. Those limits may have been reached in sectors of the state currently providing more than 80 per cent of North Dakota's total migratory waterfowl accommodations. This is based on an informal survey of farmers in selected townships of Walsh, Cavalier, Towner, Ramsey, Benson, Nelson, Griggs, LaMoure, Dickey, and McHenry counties. About one in ten farmers had no strong feelings one way or another on the subject of wetlands acquisition, maintenance, or management over time. Among those expressing strong feelings, about seven in ten indicated interest in maintaining Type 3, 4, and 5 wetlands for the accommodation of game ducks in return for governmental assistance with economic drainage of excess flood and sheetwaters from valuable croplands currently classified as Type 1 and 2 wetlands. Such willingness was hedged with a desire to have the competent soils technicians establish Type 3 and 4 wetland classifications.

Historically, North Dakota's water problems have been associated with too much or too little for economic cash crop production. For about six in ten commercial farmers east of the Missouri River, loss of potential agricultural production and related income due to excess water has been more serious over time than losses due to lack of water. Excess water damage has been most heavy on highly productive but incompletely drained lands located in central, east central, and Red River Valley sectors of the state where snowmelt and rainfalls are relatively heavier than in western North Dakota.

General Conclusions

The inherent disposition for wildlife conservation people to resist any and all land drainage proposals as deleterious to preservation of natural habitat useful in game duck propagation is observed and understandable up to the point of reason. It also triggers unnecessary opposition to waterfowl conservation policy and supporting wetlands acquisition to maintenance programs administered for the public by the Department of Interior's Fish and Wildlife Service, particularly on the part of farm people and civic leaders sympathetic to the problems of their community's commercial agricultural industry. It is obvious that each successive delay in obtaining needed cropland drainage service will be costly to farmers, businessmen, and the state's economy as a whole.

Studies of economic aspects of North Dakota's wetland utilization indicate that migratory waterfowl is indeed a valuable resource, with national import. But this resource is primarily the product of privately owned

farmlands. Continued propagation of waterfowl abundance necessitates (a) appreciation of the value and import of this public resource by the landowner-operator, (b) retention of more valuable waterfowl habitat insofar as is economically practical, (c) full cooperation of the public in enhancing opportunity to have stewardship of wetlands developed and improved over time, and (d) recognition and respect for the farmer's right to manage his land in his best interests, as it is his means of livelihood.

PART II

ECONOMIC AND RELATED ASPECTS OF UPDATING WETLAND MANAGEMENT IN THE SWEETWATER-DRY LAKE WATER MANAGEMENT DISTRICT

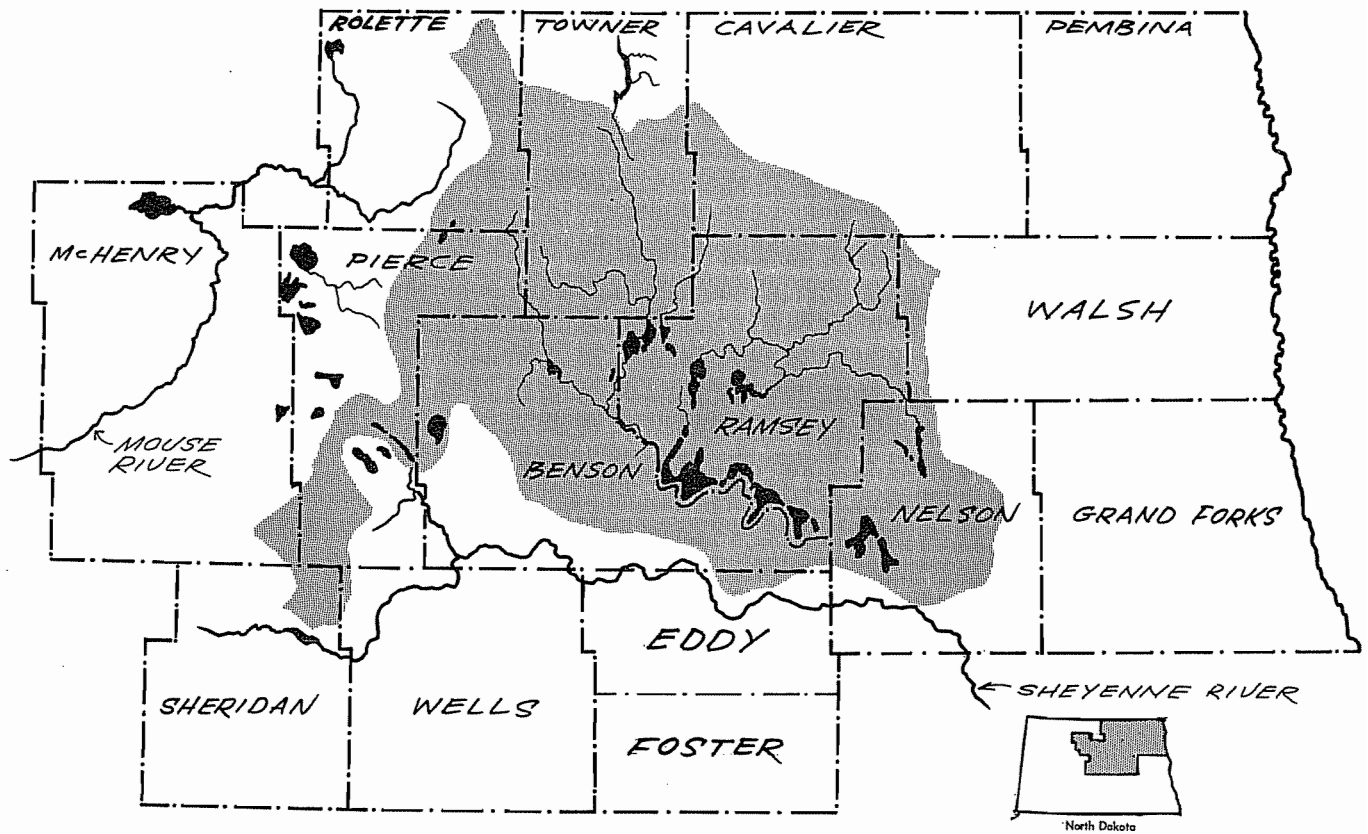
Some Background Information

The Sweetwater-Dry Lake Water Management District within North Dakota's Devils Lake Watershed is an area known to the nation's sportsmen as one of the better migratory waterfowl flyways and production areas in the United States, or in all of North America (See Figure 3). It is also a 488,000 acre land use area comprising fertile but topographically undulating cropland in the heart of North Dakota's naturally favored top-quality durum wheat and malting barley country (See Table 1). Fairly typical of North Dakota's potholed prairie land use sector, this district's farmlands, perhaps more than most others, are heavily potholed and chronically subject to delayed seeding or difficult harvesting conditions stemming from incomplete or inadequate drainage for flood and sheetwater excesses.

Delayed Seeding Costly

Area-wise, most of the district's flood and sheetwater excesses are associated with many hundreds or several thousands of small, technically Type 1 and 2 wetlands holding sheetwater in reservoir pockets long enough to seriously impede timely seeding of cash crops. They also hold water following occasional periods of heavy harvesttime rainfall (perhaps once every three to five years), resulting in marketability and actual crop yield losses. In 1965 the northern flights of ducks and geese arrived before swathed wheat and barley crops were harvested. Those instances may occur at least once every 10 years, with strong probability of a one in five year frequency.

On about 40 per cent of the farms in the district the many Type 1 and 2 wetlands common to most farms are interspersed also with many Type 3 wetland areas usually about one and one-half to two or three acres in size, together with Type 4 and occasional Type 5 wetland areas considerably larger in size and normally unsuited for cropping. Many of the Type 3 wetland areas within the district are cropped about twice, but of every five years now. Type 3, 4, and 5 wetlands approximate 48,000 to 50,000 acres of prime natural waterfowl habitat within the district.



Its Wetlands: (a) 20,000-25,000 acres of Class 1-2 wetlands used for economic crop production;
 (b) 45,000-48,000 acres of Class 3-4-5 wetlands providing prime waterfowl habitat,
 of which about 20,000-22,000 thought to be Class 3 and partially suited for
 economic cash crop production, with adequate drainage.

Figure 3 THE DEVILS LAKE NATURAL DRAINAGE BASIN

TABLE 1. SUMMARY STATEMENT OF COMPOSITE FARMLAND USE IN SWEETWATER-DRY LAKE WATER MANAGEMENT DISTRICT, 1965-1966 AND 1959-1960*

Item	1965-1966	(Yield)	1959-1960	(Yield Level)
Acres, district total used.....	488,000		488,000	
% in cropland, approximately.....	88		89	
% not used for crops, about.....	12		11	
% of farmland used for composite-acre base.....	100		100	
% of farmland in fallow (idle cropland, inc.).....	31.5		27	
% of farmland in wheat and rye.....	25.0	32/26 bu.	26	31-25 bu./acre
% of farmland in barley.....	16.0	42 bu.	26	43 bu.
% of farmland in oats.....	3.0	55 bu.	2 est.	50 bu. est.
% of farmland in flax.....	3.0	12 bu.	2	16 bu.
% of farmland in tame grass and legumes.....	6.0	1.7 ton	6	2½-3-4 tons
% of farmland in fallow or in harvested crops.....	84.5			
% of farmland in wheat/rye lost to flooding.....	2.0	above	incl. above by SCS*	
% of farmland in barley/oats/flax flooded out.....	1.5	above	incl. above by SCS*	
% of composite-base in planted crops or fallow.....	88.0		89	
Ave. loss per composite farmland acre, flooding.....	\$1.60 (current)		\$ 1.50 projected average	
Total gross crop income lost to flooding, about.....	\$780,800		\$ 732,000 or more*	
Ave. late-seeding loss (wheat and barley), about.....	\$.30 (minimal)		*	
Total wheat/barley income lost to late planting.....	\$ 146,400		*	
Ave. loss in wheat's marketability, ex. water.....	\$.10 (current)			
Total wheat income lost from marketability above.....	\$ 48,400			
Approximate crop income loss, inc. drainage.....	\$ 975,600		See Report	

* 1959-1960 summary estimates taken from USDA-SCS report on "Potential Benefits From Drainage, Devils Lake Watershed, North Dakota," as revised in April, 1962. SCS appraisal based on land use capability with development and use of needed lateral and feeder ditching for efficient removal of excess flood and sheetwaters over time. No costs of drainage facilities deducted from gross benefits.

1965-1966 summary data based on NDSU's Agricultural Statistics Number 15, published May 15, 1966, in cooperation with USDA's Statistical Reporting Service's Field Operation's Division. District data are extrapolated from official land use and yield/price information for Ramsey County.

Half of Farmers Suffer Most of Loss

Intermittently, half of the district's commercial farmers have sustained heavy losses in potential crop income due to incomplete drainage of excess flood and sheetwater during an observed time period of more than 30 years. During this same time period, more than half of the district's farmers have sustained losses arising from incomplete drainage of excess sheetwater remaining on fields following heavy rainfalls.

Permissive Drainage Restricted

A moratorium on construction of permissive croplands drainage facilities has been imposed upon the district for about 10 years by the State Water Commission. This will continue until an approved channeled outage for excess flood and sheetwater drained from croplands is connected with Devils Lake. During the past decade, water management problems in the district have been aggravated by farmers on higher lands who have improved field drainage systems, while on the low lying farmlands the excess water has no place to go. About a third of the district's commercial farmers have economic reason to put pressure on district management to obtain a practical flood control and multipurpose wetlands management program on a working basis at the earliest opportunity possible.

Early Survey Indicated \$1 Million Crop Loss

In cooperation with the Soil Conservation Service, the district organization undertook a rather comprehensive study in 1941-1945 on land use in the area over a 15-year period. The study revealed an average annual loss of about a half-million dollars in each of the two sectors of the Sweetwater-Dry Lake watershed that might have been prevented with adequate sheetwater drainage and flood control facilities. The study also indicated a serious problem in soils, alkalinity building up in the Edmore area, affecting nearly 20 per cent of the farmland there by reason of excess water lying overlong on incompletely drained farmlands. Shortly thereafter, a rather ambitious area wetlands program was planned under the auspices of the United States Corps of Army Engineers, embracing this district and adjacent areas in the general Devils Lake Watershed area.

Area Watershed Program Planning

The proposed program developed early in the 1950's as an "Army Engineer' Flood Control or Watershed Program" failed to satisfy interests of the United States Fish and Wildlife Service in wetlands acquisition, maintenance, and/or mitigations of the migratory waterfowl resource long associated with the Devils Lake Watershed and the Sweetwater-Dry Lake Water Management District. An impasse developed between proponents of flood control and removal of excess sheetwater from farmlands and those insisting that most of the area's natural waterfowl habitat be maintained over time. Further, project costs appeared greater than some felt justified by projected benefits. After considerable hassling the United States Army Corps of Engineers terminated its planning

assistance for the area's flood control or integrated wetlands management. At the same time, the State Water Commission's moratorium on permissive farmland drainage (some of it with sanction or financial and technical help of USDA's Soil Conservation Service and Agricultural Soil Conservation Service Programs) went into effect.

Efforts have been made to obtain approval for an SCS administered Watershed Program that might integrate flood control, economic cropland drainage, maintenance or mitigation of prime waterfowl habitat at tolerable levels, and/or development of feasible outdoor water recreation area facilities as needed within a single district program. Many discussions and conferences of an interagency nature marked this continuing effort, together with some effort at informing the public concerning what was at issue. Finally, a very necessary and difficult task involved developing criteria for further development or activation of the desired watershed program. Many farmers took a dim view of those criteria on obtaining easements limiting drainage of Type 3, 4, and 5 wetlands from individual landowners. At their request the district's directors submitted the alternative of proceeding with a program of providing for approved reservoir and drainage service facilities with residents defraying the costs in lieu of pursuing approval of an SCS administered Watershed Program. By the narrow margin of one per cent, district farmland owners affected by the proposal protested its authorization in 1966. As proposed, the district might have otherwise proceeded to pay all construction costs (estimated at about \$750,000) of a basic channel linkage with Devils Lake, including an interlake service reservoir facility to be developed as recommended by the State Water Commission.

Critical Issues

Critical issues in updating district wetlands management concern the money costs and economic benefits of proposed flood control and cropland drainage. These issues also concern resource conservationists with the responsibility of protecting the public's interest in waterfowl preservation for posterity. Resource planners have the difficult task of helping those concerned with the use of wetlands, values created thereby, and the benefits from change in resource use over time. Also very much at issue is who pays the costs, determined by who is benefited over time by the programs. And appraisals of economic aspects of proposed actions are sometimes hard to equate with the whirl of winged ducks in flight, of the "skroonk" of the wild goose providing eye and ear filling pleasure to area residents.

People seem to understand and are disposed toward resolution of conflicts within the district, area, and state, generally. This disposition seems to include the majority of farmers who, despite the economic cost of waterfowl accommodation on their farms, are seemingly waterfowl-conservation oriented to the point where they might willingly restrict drainage of Type 3, 4, and 5 wetlands for a half-century or more, if need be, to get an updated wetland management program operative. The three in four farmers disposed that way, however, insist that wetlands classification be updated.

Incomplete Drainage A \$1 Million Per Year Loss

Conservatively estimated, the average annual cost of incomplete drainage for flood and sheetwater excesses from Sweetwater-Dry Lake Water Management District farms is about \$1 million. In years of delayed seeding of crops, potential cash crop income foregone by district farms may be projected 10 to 15 per cent higher than that between now and such time as adequate flood and sheetwater drainage of croplands may be obtained.

District Ducks Carry \$20 Price Tag

Put another way, Ramsey County farmers alone (like those in other similar potholed prairie sheetwater and flood drainage areas) are incurring annual losses of about \$1 million because of lack of basic flood and sheetwater drainage service facilities and secondary field drainage. Assuming this cost to be the price of producing 50,000 game ducks for gunners annually (through retention of natural wetlands for game duck accommodation) some far farmers facetiously reckon that the farmers of Ramsey County are spending \$20 per duck supplied the general public. It may be that they are doing just that, over and above the food or feed provided for game duck propagation each year, through foregone drainage of sheetwater excesses from Type 1 and 2 wetlands normally providing temporary springtime accommodation for breeding pairs of ducks.

Previous surveys and economic appraisals relating to costs and benefits of excess water removal from farmlands were reexamined in 1966. An economic analysis of the impact of incomplete drainage on crop income for the district was made for the production year 1965 and its complementary 1965-1966 marketing year. Foregone cash crop income was just under \$1 million for district farmers in 1965-1966 (a good yield year). A large part of crop income loss came from planted crops not harvested by reason of flooding or excess sheetwater remaining on the land too long while crops lay in the swath. Next and frequently economically very important was the impact of delayed seeding on yield, marketability, and gross return per acre for wheat and malting barley. About 25 per cent of the composite wheat and barley acreage was yet to be planted by May 20, a situation conservatively associated with yield reductions of three to five bushels from potential output with earlier planting, according to research findings relating to timeliness of seeding for North Dakota crops by NDSU agronomists. Late planting, too, is highly deleterious to marketability for malting barley, according to NDSU researchers, who associate late planting with high protein contents and resulting price discounts for malting barley. Impact of delayed harvesting on the marketability of 1965 wheat was difficult to accurately appraise since most of the region was subjected to a five-week period of wet weather. Nearly one-third of the region's wheat crop was subjected to adverse weathering in the swath, a condition expected to occur normally no more than once in 10 years for the region, generally (but already twice for this district within the past decade).

\$1 Will Return Farmers \$3 to \$4

Salinization of fertile croplands subjected to excess sheetwater coverage for substantial time periods, together with added cost of equipment usage

per acre, needs to be considered in projected benefits of excess sheet and floodwater drainage that might be taken to update use of farmlands within the Sweetwater-Dry Lake Water Management District.

Conservatively estimated, district farmers should benefit by about \$3 to \$4 for every \$1 expended on updating facilities for removal of excess sheet and floodwater from valuable croplands over time. In about one in seven years, there is probability of potential loss in crop income from excess water sufficient, if prevented, to pay for construction and maintenance of basic district reservoirs, channeling, and the main drainage laterals or restored coulees into which farm field drains might empty.

Are Farmers Subsidizing Duck Hunters?

District farmers figure that game ducks cost them roughly \$20 to produce by way of cash crop income foregone on fertile wetlands needing economic drainage stymied, thus far, through delaying tactics of wildlife representatives holding drainage to be deleterious to accommodation of game ducks and the public's continuing interest therein. Average game duck output for the district runs from 40,000 to 50,000 annually, according to Ellison Madden, local Fish and Wildlife Service representative, with the latter figure a conservative norm under good management and normal precipitation within the area.

Department of Interior estimates that wildfowlers tend to spend a little more than \$50 annually with service and supply people contributing to their gunning pleasure, in addition to a sizable investment in guns and equipment used. If so, then 50,000 game ducks produced in the region would service the annual recreational activity of about 10,000 duck hunters bagging an average of five ducks per gun, and the related spending of about \$500,000 with service people catering to their hunting pleasure. Somewhat facetiously, some district farmers suggest that commercial farmers in the Devils Lake Watershed are, in reality, subsidizing the nation's duck hunters by about \$10 per duck. If so, they ask, is it not fair to ask the public to expend federal and state monies (and technical assistance available from public agencies) to cooperate financially and otherwise with local district personnel in the planning and activation of updated multipurpose wetlands management programs serving public and private interests adequately at one and the same time? They make a strong case for integrated wetlands programming!

In North Dakota, about 50,000 resident and nearly 5,000 non-resident hunters are licensed (as of this past year). Total revenue from license fees is roughly \$2.75 millions. Presumably about 10 per cent of the state's gunning pressure is concentrated in the Devils Lake Watershed and/or Sweetwater-Dry Lake Water Management District. Conservatively, the district may be said to support a waterfowling activity leaving a minimum of a half million dollars with local service and supply people in the general Devils Lake area each fall because of the district's 50,000 game ducks. State fees, supported by the district's waterfowl resource, are about one quarter million dollars. Total state and local dollar take for servicing waterfowlers would, therefore, figure out to be between three quarters and one million dollars annually, including considerable credit from migratory wild geese and game ducks augmenting local

production. Even then, local commercial farmers would still be in a position to say that they do literally subsidize the public's waterfowling, particularly that part having to do with game duck production each year within the district.

Will improved management of prime wetlands used as waterfowl habitat offset the potential output of ducks that might be sacrificed through drainage of all Type 1 and 2 wetlands? Farmers are of the opinion that their cooperation with wildlife specialists could serve to make such offsets common, and do even better than that with evolving production technology out of game duck management research effort. Similar optimism prevails among farmers over the probability that current game duck production might be maintained, or even improved with better technology, on 25 per cent less Type 3 wetlands than presently exist with incomplete drainage for crop production within the district.

Appraisal of the worth of a migratory waterfowl resource involves use of something more than dollars the public may spend in satisfying wants and needs in outdoor recreation in the future, as the tensions and pressures of living under conditions of modern civilization and greater population density increase. Many North Dakotans get a thrill from sky-filling, eye-filling, pleasure-packed flights of ducks and wild geese in season. Who can put dollar signs on something that pleasures man's living as much as the sight and sound of a high-flying greenhead at dawn from a duckblind, or the querulous gabble of wild geese in flight to their morning feeding grounds? The public has an innate stake in migratory waterfowl resources of a district, region, state, nation, or continent. So, if he (the North Dakotan) is a realist, he seeks out ways and means of how best to reconcile satisfaction of public interest with private or economic interests that may be somewhat in conflict, and helps get done what needs to be done to reconcile one with the other.

The Role of Easements

Under provisions of the nation's wetlands acquisition program (purchase or leasing) administered by the United States Department of Interior's Fish and Wildlife Service, perpetual easements are solicited from private landowners in the hopes of having about 20 per cent or more of the region's prime wetland habitat for game ducks maintained over time without being subjected to drainage deleterious to waterfowl accommodation except through approved mitigation practice. Presumably monetary considerations involved are arrived at through projected offsets covering taxes, interest on capital investment, and the nuisance value of having economic use of given wetlands restricted forever. Easements are financed out of monies provided from "duck stamp" revenues.

Reportedly, about 15 per cent of the district's wetlands on privately owned farmland had been put under perpetual easement as of early 1966. In 1967 it appears that approximately 25 to 30 per cent of the district's prime Type 3, 4, and 5 wetlands were restricted as to future use through voluntary action of conservation minded farm management in the district. This is a higher percentage than many thought possible just a year ago, and a level that could continue on up to 40 to 50 per cent by early 1968. Obviously, farmers willing to give such easements feel strongly about preservation of

a wildfowling heritage. It is the opinion of most real estate authorities queried that existence of a wetlands usage easement in perpetuity automatically means a willingness to sacrifice about \$1,000 when the land is transferred.

Forever is a long, long time! Many farmers willing to restrict use of prime wetlands during their lifetimes to game duck accommodation, on a voluntary basis, hesitate putting restricted use into legal terms affecting their lands long into the unfathomable future. An alternative under the SCS Watershed Programming calls for easements for 50 years, which restricts use of prime Type 3, 4, and 5 wetlands without offsetting mitigation approved by the district. These easements do have the advantage of being negotiable, in part, with local people from time to time. While they make land transfer a little messy, the economic impact of restricted land use for a half century is considerably less than perpetual restriction. For practical purposes, this easement does about everything the perpetual easement is expected to do. Normally, approval and activation of an SCS administered Watershed Program requires minimum use restriction, through approved easement, of 75 per cent or more of prime wetlands currently existent for accommodation of migratory waterfowl.

The Case For P.L. 566 Watershed Programs

There are many alternative program approaches to updated water management at the district level. Of those considered and analyzed in depth, it is recommended that the Sweetwater-Dry Lake Water Management District obtain and use "the P.L. 566 Small Watershed Program," administered by USDA's Soil Conservation Service in cooperation with North Dakota's State Soil Conservation Commission, and others, to attain desired multipurpose goals. The Soil Conservation Service has the technical "know-how" and experience for coordinating a concerted use of interagency resources in the development and operation of a practical management program fitted to economic and political needs of the district, watershed area, state, and region over time.

Reconciliation of the long-standing impasse between proponents of excess flood and sheetwater drainage for district farmlands and wildlife agency representatives holding such action to be deleterious to waterfowl habitat and production over time can best be obtained under a P.L. 566 Watershed Program. Other approaches to updating the Sweetwater-Dry Lake Water Management District lands utilization practice have been ineffective in getting needed flood control or the basic facilities on which such control must develop. Further delays through untested programming techniques are too costly to be tolerated by patient farmers most affected by costs (direct and indirect) of excess water. The time for action is now. A decade of inaction has already cost farmers and the Devils Lake business community more than \$10 million! Further, many areas in North Dakota with similar problems to those of this district may be greatly influenced by methodology employed and results obtained for updating wetlands management in the foreseeable future. North Dakota's economic stake in a successful Watershed Program in this district may be roughly ten times that of the district and Devils Lake.

If approved and made operative, a P.L. 566 Watershed Program can provide adequate conservation and economic treatment of all lands within the watershed, using public funds on those activities contributing to public benefits and pointing up areas where private gains are to be financed with private

monies under a single integrated programmed approach. A principal purpose of the small watershed project is provision for adequate flood protection for all parts of the flood plain consistent with economic justification. It involves improvements affecting other than agricultural lands (e.g., reducing flood damages to roads, bridges, utilities, etc.).

Other things such a project undertaking may legitimately have to do with include: (1) gully and sedimentation controls, (2) economic drainage, (3) outdoor recreation and recreational facilities, (4) practical fish and wildlife development, (5) pollution abatement, where needed, and (6) others, including help with community or industrial water supplies.

Local district activities include requesting program help of the Secretary of Agriculture, assuming nontechnical leadership in developing a work plan; keeping area residents informed; obtaining trespass permits, land easements, etc.; paying a share of construction costs for purposes other than flood prevention; providing a contracting officer; paying engineering service costs for any municipal water or recreational endeavors; promoting installation of land treatment measures on farms; obtaining needed water rights; and operating/maintaining structural measures in the project.

Prime state responsibility in the watershed program rests with the State Soil Conservation Committee, chaired by the governor, and includes: application review and approvals, providing other state agencies opportunity to inspect watersheds, establishing priorities, allocating state funds to sponsoring local organizations, informing citizens, and recommending approval of watershed work plan for operations.

The State Water Commission provides technical assistance in developing watershed work plans, reviews and comments on draft plans, grants water rights, and approves design of all structural measures. The State Game and Fish Department assists in planning wildlife developments and mitigations measures, has paid part of construction costs for wildlife measures, and reviews and comments objectively on draft plans. Other state agencies provide assistance also, including the North Dakota State University Extension Service, North Dakota Agricultural Experiment Station, North Dakota Highway Department, state parks, and forest services.

Three federal agencies of the United States Department of Agriculture are primarily involved (Soil Conservation Service, Forest Service, and, if loans are involved, the Farmers Home Administration). The ASCS can be involved through their Agricultural Conservation Program if additional funds are made available to farmers within the watershed for establishing land treatment measures. Federal responsibilities normally include providing technical assistance in watershed work plan development; providing total construction cost of measures for flood prevention, sediment, and gully erosion control; paying part of construction costs for measures that serve drainage, irrigation, recreation, and fish and wildlife; providing added technical help to landowners through soil conservation districts in speeding up establishment of land treatment measures; providing engineering and geological services during construction phase, project engineers, and inspectors; on recreational purposes only projects, paying 50 per cent of cost of needed land, easements/rights-of-way, and half the cost of certain recreational facilities; making loans to

sponsoring local organizations to finance project; and advising sponsoring local organizations on needed maintenance.

Cooperation between local, state, and federal agencies in North Dakota has been outstanding up to now. Some problems and differences of opinion occur from time to time but representatives of all agencies have demonstrated that they are reasonable men, wanting what's best for North Dakota, a motivating reason for recommending a P.L. 566 Watershed Program approach for this and other districts without qualification as the best of alternative approaches examined.

* * *

In Conclusion, this report has briefly described the problem situation including an emphasis on the unique and key position of North Dakota in the nation's production of waterfowl. It has examined some of the economic and public problems of the situation in the Devils Lake area. It has sought to emphasize the critical importance of the prime wetlands, with a need to obtain a consensus in the description of these lands, and especially of the Type 3 wetlands.

This report has presented some information on the important wetlands problem. Clearly, the problems remaining to be resolved are challenging. That men of good will may differ is to be expected; but the opportunities to serve the best interests of the farmer, community, and nation are so very great. In the traditions of our great nation, we hope that these great problems will cause ordinary men to rise as great leaders to meet the great challenges.

* T H E E N D *

Appendices and Addendums. Two appendix tables are attached to this report to provide some information on watershed programs and projects in North Dakota. Addendum I permits the author an opportunity to present some personal comments and observations. In Addendum II some ideas on guidelines and criteria for a proposed watershed program have been presented, but are not presented as recommendations. The bibliography credits some of the sources of information and ideas used in this progress report.

APPENDIX TABLE 1. USDA-SCS, STATUS OF WATERSHED PROGRAMS, 10-20-65

Projects	Acres	Location by County
<u>1. Completed Projects</u>		
Tongue River Pilot Project	295,575	Pembina, Cavalier
<u>2. Projects Under Construction</u>		
Wild Rice Creek	233,522	Sargent-North Dakota Marshall-South Dakota
Tewaukon	93,782	Sargent-North Dakota Marshall-South Dakota
Wild Rice "B"	145,385	Richland, Sargent
Swan-Buffalo Creeks	203,520	Cass
Elm River	221,696	Traill, Cass, Steele
Lower Forest River	212,000	Walsh
North Branch Forest River	107,014	Walsh
Middle-South Branch Forest River	219,520	Walsh, Nelson, Grand Forks, Cavalier
Willow Creek-Park River	118,460	Walsh, Pembina, Cavalier
St. Thomas-Lodema	55,760	Pembina
<u>3. Projects With Structural Measures Completed</u>		
West Tributary Bois-de-Sioux River	30,220	Richland
<u>4. Projects Being Planned</u>		
Middle Branch Park River	105,600	Walsh, Pembina, Cavalier
North Branch Park River	144,800	Walsh, Pembina, Cavalier
South Branch Park River	243,302	Walsh, Cavalier
Boundary Creek	131,563	Bottineau
Square Butte Creek	195,200	Oliver, Morton
Veblen	115,000	(Richland, Sargent-N.Dak.) (Marshall, Roberts-S.Dak.)
Lower Turtle River	216,600	Grand Forks
Upper Turtle River	149,320	Grand Forks, Nelson
Buffalo Coulee	101,000	Traill, Grand Forks
Midland-Drayton	53,680	Pembina

- continued -

APPENDIX TABLE 1. USDA-SCS, STATUS OF WATERSHED PROGRAMS, 10-20-65 (continued)

Projects	Acres	Location by County
<u>5. Projects Where Planning Has Been Suspended or Terminated</u>		
Louse Creek	240,000	Morton, Grant
Storm Lake-Elk Creek	210,000	Richland, Ransom, Sargent
North Walhalla Tributary of Pembina River	31,870	Cavalier, Pembina
<u>6. Project Applications Which Have Not Been Authorized for Planning</u>		
Lower Maple River	249,000	Cass, Ransom Barnes
Middle Maple River	211,840	Cass, Barnes
Upper Maple River	140,800	Cass, Barnes, Steele
Ox Creek	199,680	Rolette, Pierce, Bottineau
Willow Creek	166,400	Rolette, Bottineau, McHenry
Oak Creek	137,600	Bottineau, McHenry
Crooked Creek	110,000	Sargent
Antelope	237,320	Richland
Duck Creek	116,480	Adams
Upper West Souris	223,000	Renville, Ward
Edmore	237,440	Cavalier, Walsh, Ramsey
Starkweather	244,080	Cavalier, Ramsey
Maple River, West Branch	86,400	Dickey
Salt Lake Branch, Forest River	127,600	Grand Forks, Walsh
Northwest Minot	6,010	Ward
Big Muddy Creek	191,592	Morton
Sims-Hailstone Creeks	124,800	Morton, Oliver, Grant
Bathgate-Hamilton	38,400	Pembina
Carlisle	68,320	Pembina
Otter Creek	87,370	Oliver
Sherk Creek	28,950	Oliver
South Branch Heart River	14,320	Stark

APPENDIX TABLE 2. THE STATUS OF CONSTRUCTION FOR NORTH DAKOTA WATERSHED PROJECTS AS OF OCTOBER 20, 1965

Name of Watershed	Reservoir Type Structure ¹		Channels ²		(Miles)
	Planned	Completed : Construction : Under	Planned	Completed : Construction : Under	
	(No.)				
Tongue River (Pilot)	10	10	--	48.0	48.0
Elm River	3	2	1	64.7	60.0
Swan-Buffalo Creeks	4	2	--	27.5	20.1
Wild Rice Creek ³	4	4	--	28.2	17.1
Tewaukon	4	2	1	11.7	7.6
North Branch Forest River	4	1	1	23.4	23.4
West Tributary Bois-de-Sioux	--	--	--	9.8	9.8
Middle-South Branch Forest River	3	1	1	3.7	--
Lower Forest River	--	--	--	120.0	--
Wild Rice "B"	1	--	--	11.2	--
St. Thomas-Lodema	--	--	--	39.2	--
Willow Creek-Park River	2	--	--	56.1	--
TOTAL	35	22	4	443.5	186.0
					10.8

¹Includes floodwater retarding structures, multiple-purpose structures, and diversion dams.

²Amounts listed under "channels" include floodways and diversions as well as channel improvement.

³The four floodwater retarding structures and 23.4 miles of channel improvement in Wild Rice Creek Watershed are located in South Dakota.

ADDENDUM I

SOME PERSONAL COMMENTS AND OBSERVATIONS

(1) To an outsider visiting at random with farm people and others within this district, there seems to be considerable misunderstanding as to (a) program objectives and action proposals, (b) projected costs and benefits of the actions under consideration from time to time, (c) background to understanding national waterfowl conservation policy and supporting wetlands acquisition program activity as it pertains to region, state, watershed or district, and the individual farm, and/or, (d) cost of providing basic flood control and drainage structures, and how prorated or handled. The notion still exists with some that a "ducks versus farmers" contest is involved where obtaining needed economic cropland drainage relief is concerned. Obviously, much educational work needs to be done at the grass roots by the University's Cooperative Extension Service, the Soil Conservation Service personnel, and others in a position to help people develop a background to understanding the nature of the problems complex to be resolved in updating North Dakota's potholed prairie wetlands utilization in the foreseeable future.

(2) Regardless of why conflicts have occurred or presently exist in reconciling economic wetlands management with waterfowl conservation in North Dakota, practicality and the rule of reason suggest that tolerable compromises of divergent opinion are better than no action at all to show for much expended program planning effort on the part of busy and well-meaning people. In the past decade we've observed about 50 of the state's local area groups struggle with plans for remedial action needed for chronic flood and sheetwater problem solving. And, as yet, but about 20 of those 50 have laudable progress to point to for their pains; about 30 still have troubles to overcome in reconciling interest conflicts associated with a newer impasse between farmers wanting economic wetlands drainage and wildlife people insisting that such drainage impairs needed habitat for waterfowl. But few, if any, districts have as much at stake as does the Sweetwater-Dry Lake Water Management District; nor have many local districts put so much time and talent into a programming effort yet to take off the ground with any visible concerted programmed action. After 12 or more years of organized effort, solution to that district's difficult and complicated problems complex may yet take some doing. But, its background of experience, researched guidance information, and knowledgeable leadership have contributed greatly to facilitating what may be a bright and shining story of unified wetlands programming success in the Devils Lake Watershed, and throughout North Dakota, a decade from now. Many communities with similar problems stand to gain directly from the diligent pursuit of many action alternatives up to now by that district.

(3) New technology in wetlands management and waterfowl propagation practice will, I think, materially improve the productive efficiency of prime wetlands maintained for game duck accommodation in this district and most other potholed prairie sectors of North

Dakota. With this there is likewise a possibility that semi-artificial duck propagation and waterfowl management setups may materially contribute to relieving gunning pressures foreseen over time from population increase in an affluent modern society.

(4) To obtain permissive drainage of Type 1, 2, and part of Type 3 wetlands, it would appear that North Dakota farmers can well afford to retain Type 4, 5, and the majority of Type 3, wetlands intact for propagation or use of game ducks, especially in return for technical and financial assistance provided by the public under the preview of SCS administered Watershed Programs.

(5) Natural sloughs and coulees common to the Sweetwater-Dry Lake district, and North Dakota potholed prairie farmlands generally, provided imperfect or very incomplete drainage outlets for excess flood and sheetwater a half-century ago. Since then, cumulative filling of these imperfect natural drainage outlets with soil particles deposited through wind erosion of Great Plains farmlands over time has made many of them nearly inoperative. Their restoration, including improvement upon their natural linkage to facilitate efficient total runoffs of excess flood or sheetwaters from valuable potholed prairie croplands should hold high priority in this and other water management districts of the state lying east of the Missouri River.

(6) Planned or otherwise, the lack of economic cropland drainage (an adversity for farmers and businessmen) has been of benefit to waterfowl preservationists.

(7) Sedimentation or siltation of coulees and sloughs over time (referred to in item five) has also deleteriously affected the productive efficiency of certain North Dakota Type 4 and 5 wetlands which once provided prime accommodation for better game ducks throughout North Dakota's potholed prairie region (but more especially within the state's central and south central counties). Erosion resistant soils common to much of the Sweetwater-Dry Lake district, or erosion-control practice of farmers in recent years, has not been enough to prevent some of this in the Devils Lake Watershed; for wind erosion of farmlands elsewhere in the Great Plains is no respecter of wetlands generally, even though siltation of North Dakota potholes or wetlands has generally become more problematic within "lighter soils" or "blow soils" areas. It is our belief that timely renovation of Type 4 and 5 wetlands, generally, together with judicious prevention of further siltation in prime Type 3 wetlands, might substantially enhance game duck production within North Dakota's potholed prairie region.

(8) Pothole or wetlands classification within the purview of projected game duck accommodation over time strikes us as being something less than a nicely exact scientific exercise. Based mainly upon longevity or length of time they retain water each year, as well as related plant growth and resultant soils texture, it is evident that type descriptions may become subject to some gradation between types derived from Martin, et al., (1953 Wetland Classification).

North Dakota's fluctuating precipitation patterns, among other factors, including impact of erosion-related siltation, contributes materially to local resident questioning of current classification accuracy. Particularly is this true of reaching practical agreements 'twixt farmer and waterfowl propagationist with respect to what is and is not Type 3 wetland. From a practical standpoint it is our belief that the value-judgment of a competent local soils technician must be called upon to rule upon what currently classes as Type 1, 2, and 3 wetlands where honest differences of opinion might otherwise stymie cooperation of the farmer and waterfowl conservationist in getting on with mutually beneficial actions.

ADDENDUM II

A. GUIDELINES/CRITERIA FOR A PROPOSED 566 WATERSHED PROGRAM

Creation of an interagency task force to develop practical criteria or guidelines for a proposed 566 Starkweather-Edmore Watershed Program was recommended at the February 10, 1966, interagency meeting of state and federal water utilization program representatives and others with directors of the Sweetwater-Dry Lake Water Management District at Devils Lake, North Dakota, as a step toward partially resolving a chronic problems complex associated with previous efforts to reconcile needed economic cropland drainage with the maintenance of prime waterfowl habitat at levels satisfactory to wildlife people. Such a task force was to include representatives of the United States Bureau of Sport Fisheries and Wildlife, North Dakota State Game and Fish Department, the United States Soil Conservation Service, and North Dakota State Water Commission, and to solicit opinion of others in a position to provide useful consultation from time to time. Establishment of such a task force was provided for by letter from the State Water Commission to each agency concerned as of March 23, 1966. It convened formally in the Ramsey County Courthouse on Tuesday, April 12, 1966; field trips, and many relevant discussions in depth were relied upon by the task force in the establishment of guidelines and criteria for a proposed 566 program fitted to the particular needs of the Sweetwater-Dry Lake Water Management District's Edmore and Starkweather Watersheds. On Thursday evening, May 19, 1966, the task force's report outlining basic guidelines and criteria was presented in open meeting sponsored by the Sweetwater-Dry Lake Water Management District in the Courthouse at Devils Lake, North Dakota. Among those key items presented to that meeting, and generally recommended or approved as basic in proposed 566 Watershed Programs for potholed prairie sectors of North Dakota, were the following.

- (1) Giving top priority to, and concerted approval for, early construction of a floodwater reservoir and water level controls complex involving Sweetwater and Dry Lakes with approved channel linkage of the complex to Devils Lake, as approved and recommended by the State Water Commission;

(2) Permissive removal of excess sheetwater from farmlands into laterals and coulees maintained by the district, including permissive drainage of Type 1 and 2 wetlands (the small, shallow pot-holds contributing most heavily up to now to delayed seeding, harvesting, or loss of planted cash crops over time) without restriction as to mitigation;

(3) Appropriate mitigation of any prime waterfowl habitat necessarily destroyed in construction of basic floodwater control reservoirs, drainage channels, and/or reconstruction of natural coulee drains serving the district;

(4) Easement (or voluntary agreements restricting use of Type 3, 4, and 5 wetlands similarly to those of perpetual wetlands easements being obtained by Fish and Wildlife Service granted by landowners to the district for a time period of 50 years) for retention of 85 per cent of the district's prime wetlands (Type 3, 4, and 5) for waterfowl accommodation, as a desirable goal for wetlands conservation;

(5) The further provision or arrangement permitting 10 per cent of the above 85 per cent of prime wetlands to be drained by farmers when approved mitigation could be provided as offset for prime lands drained, as approved jointly by SCS and wildlife agency representatives. Thus, actually, combined easements or restricted use agreements covering prime wetlands would affect but 75 per cent of the district's Type 3, 4, and 5 wetlands. Types 4 and 5, normally, are too wet to farm anyway. Type 3 wetlands are on the borderline of being economically drainable, and might be farmed about two years out of five without drainage. It was the consensus that cropping Type 3 wetlands in event of drouth was permissible, but that drainage restricted through easement or agreement could not be approved without mitigation.

(6) The district would provide for local coordination, rights-of-way, local liaison, and contacts in obtaining needed wetlands easement or restrictive agreements from landowners, and generally expedite (in an advisory capacity) the work of program supervisors.

B. PROPOSED DISTRICT 50-YEAR EASEMENT

E A S E M E N T

THIS INDENTURE, made this _____ day of _____, 19____, by and between _____ husband and wife, hereinafter referred to as the Grantor(s), and the Sweetwater-Dry Lake Water Management District, hereinafter referred to as the District.

WITNESSETH:

WHEREAS, the Grantor(s) (is, are) owner(s) in fee of _____ areas of Type (II, III, IV, V) wetlands, containing approximately _____ acre, more or less, in the _____ Quarter of Section _____, Township _____ North, Range _____ West, _____ County, North Dakota, as indicated on the attached map, which map is, by this reference, made a part of this Easement to the same force and effect as if it were incorporated into the body of this Easement.

WHEREAS, the wetlands within the above described tract of land are needed by the U.S. Bureau of Sport Fisheries and Wildlife and the North Dakota State Game and Fish Department for waterfowl production areas.

NOW, THEREFORE, for and in consideration of the sum of _____ dollar(s), the receipt of which is hereby acknowledged, the Grantor(s) for (_____ self, themselves) and _____ heirs, successors and assigns, hereby grant, bargain, sell and convey to the District and its assigns, an easement or right of use, for fifty years from the above date, for the maintenance of the areas of wetlands described above as a waterfowl production area, including the right of access thereto by authorized representatives of the United States and the State of North Dakota.

IT IS COVENANTED AND AGREED by the Grantor(s), for (_____ self, themselves) and _____ heirs, successors and assigns, that they will cooperate in the maintenance of the aforesaid lands as a waterfowl production area by not draining or permitting the draining, through the transfer of appurtenant water rights or otherwise, or any surface water including lakes, ponds, marshes, sloughs, swales, swamps, or potholes, now existing or reoccurring due to natural causes on the above-described tract, by ditching or any other means; by not filling in with earth or any other material or leveling, any part or portion of the above-described tract on which surface water or marsh vegetation is now existing or hereafter reoccurs due to natural causes; and by not burning any areas covered with marsh vegetation.

RESERVING, however, to the Grantor(s) _____ heirs, successors and assigns, all such rights and privileges in the above described tract of land as may be used and enjoyed without interfering with or abridging, the rights and easements hereby granted to the District and its assigns, including, but not limited to, farm practices such as grazing, hay cutting, plowing, working and cropping wetlands when the same are dry of natural causes, and that the Grantor(s) may utilize all of the subject lands in the customary manner except for the draining, filling, leveling and burning provisions mentioned above.

IT IS FURTHER COVENANTED AND AGREED by the Grantor(s) and _____ heirs, successors and assigns that they have good and sufficient right, title and interest in and to said tract of land to sell and convey the rights and easement as aforesaid, and that _____ will warrant and defend the title to the District, and its assigns, against the lawful claims and demands of all persons.

IT IS FURTHER AGREED that neither the Grantor(s) or _____ heirs, successors or assigns shall not be released from the conditions and terms of this Easement unless such release is executed by the North Dakota State Water Commission as well as the District.

WITNESS:

WITNESS:

WITNESS:

STATE OF NORTH DAKOTA)
) SS
COUNTY OF _____)

On this _____ day of _____, 19____, before me a Notary Public within and for said County, personally appeared _____ who executed the foregoing instrument and acknowledged they executed the same as _____ free act and deed.

Notary Public

County

Dist.

SWC

Dist.

Grantor(s)

N.D. Game and Fish

Bureau of Sport Fisheries and Wildlife

Much concern has been expressed over restricting cropland drainage to not more than 15 to 25 per cent of prime wetlands now maintained in the district, including the contentious Type 3 wetland over which honest differences of opinion frequently exist as to what is and is not Type 3. From a practical standpoint it seems obvious that fixing of Type 3 descriptions must be done with landowners "as of now" by competent soil technicians, and not to excite landowners by reason of an earlier classification no longer existent following years of erosion fill-ins. There is just no shortcut to the slow process of individual contact, and educational work with landowners essentially necessary to obtaining cooperative land use needed.

In approving the task force's recommended criteria would we be selling farmers and "a district" down the river by being a willing advocate of maintaining 75 per cent of the district's prime Type 3, 4, and 5 wetlands habitat for waterfowl propagation accommodation over time? We don't think so, for economic reasons associated with the expenditure of public funds under the Watershed Program for development of the district's total multipurpose wetlands utilization program over time, including help with feasible water recreational facilities. Dollarwise, we'd say it's a fair bargain. Farmers would and will be obtaining "the long sought go ahead" on needed economic flood control and excess sheetwater drainage from croplands, including all Type 1 and 2 wetlands if desired. Permissive drainage of 15 per cent of the district's Type 3 wetlands could take place without mitigation, and another 10 per cent of Type 3 wetlands might be drained with approved mitigation. Permissive drainage of 25 per cent of all Type 3 wetlands isn't an exorbitant price to pay for what the district stands to receive by way of public program assistance over time, financial and technical. Further, we would add out of our unofficial knowledge of progress being made during the past year in wetlands acquisition through easement by the Fish and Wildlife Service that, contrary to some opinion, a substantial number of farmers are not opposed to restricting use of prime wetlands for preservation of the nation's rich wildfowling heritage over time.

Do we think a 50-year voluntary agreement to maintain prime wetlands for waterfowl accommodation economic or fair? We would have preferred limiting such agreements to 40 years, or one farmer's normal operational lifetime; but others had another opinion that overruled our suggestion to shorten the term. The difference is not economically significant enough to fight a major war over, and the opportunity for review and revision locally is a safety provision in event of unusual need for change in agreements given the districts to help the watershed program become operative.

The crux of a nicely operative programs criteria is, in our opinion, avoiding needless misunderstandings and strife over descriptive classification of prime wetlands, with accent on clarification of Type 3 wetlands in place as requested.

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