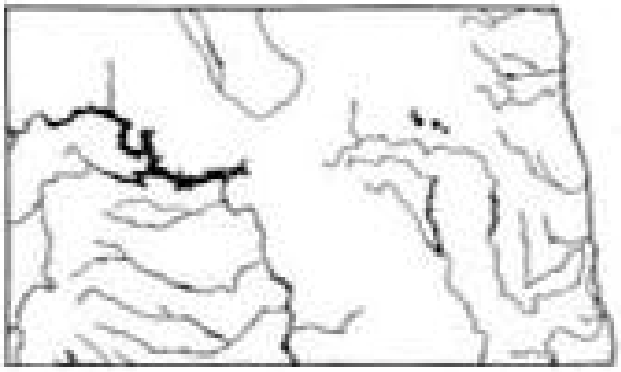

Technical Report No: ND07 – 05

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Abstract

Farmland price impacts of wetlands, US Fish and Wildlife Service wetland easements, and hunting/recreational sales in North Dakota were estimated by regressing sale prices on selected physical and legal characteristics of sold parcels. The presence of wetlands reduced the average sale price by $0.26 per acre on the entire parcel; or, stated another way; an acre of wetland was worth $192, or 27% less than the average per acre sale price of land of $262. When a US Fish and Wildlife wetland easement was associated with a parcel, the average per acre sale price was reduced by $26, or 10 percent of the average per acre sale price. The reduction in market price of a sale parcels containing wetlands and/or associated with an easement underscores the necessity of compensation to landowners for participation in wetland conservation programs. Hunting sales did not have a statistically significant influence on land prices. However, the small sample size (n = 26) of sales in this category may be responsible for the lack of statistical significance.

Acknowledgements

We thank the North Dakota Water Resources Research Institute for their financial support of this project. We are indebted to Dr. Steve Shultz for his expert direction of the data gathering phase of this project. We thank undergraduate research assistants Andrew Kessler and Nick Schmidt for contributing their considerable GIS skills. We are also grateful to the tax assessors and other county employees of the four-county study area who so graciously provided assistance in our collection of land sale data. Thanks to Thomas DeSutter, NDSU Department of Soil Science, for his review. This report is a summary of Goltz's MS disquisition (Goltz 2007).

Introduction

Wetlands have been viewed with suspicion and dread for thousands of years (Hurd 2001). Dante Alighieri, Carl Linnaeus, and G. K. Chesterton all made disparaging literary references to wetlands. *Beowulf*, the epic poem from early English literature, describes the mythical monster, Grendel, as a creature of the marsh. Hollywood has produced several movies depicting the undesirable nature of wetlands (Mitsch and Gosselink 2000). Settler families on the American frontier viewed wilderness (including wetlands) as threatening, unproductive obstacles. Their lives tended to be so dominated by hard labor, poverty, and misfortune that environmental concerns were completely unrecognized (Taylor 1998).

In theory, it is not until a society's average income level has risen sufficiently above subsistence, and basic investments in health and education have been completed,

that environmental issues begin to be considered important[1] (Dasgupta et al. 2002). Hence, it is not surprising that the United States has converted more than one half of its initial acreage of wetlands to other uses since the beginning of European settlement, primarily to agricultural development (Scodari 1990). Limited available data indicate worldwide conversions of wetlands are similar to the estimates for the United States (Barbier et al. 1997).

Expanding scientific knowledge of the ecological functions of wetlands has led to a rise in understanding of their values (Heimlich et al. 1998). However, wetlands occupy spaces that are typically privately owned, with many of the functional benefits accruing to society in the form of non-market goods, and not to the landowner. Landowners, thus, have legitimate, economic incentives to convert wetlands to other uses whenever the discounted present value of the returns to conversion is greater than the private cost (Leitch and Danielson 1986). The social benefits of wetlands may include: wildlife habitat, nutrient cycling and storage, pollution control, aesthetic amenities, recreational services, non-use existence value benefits, agricultural output, other commercial output, shoreline storm abatement, and extended food web control (Turner 1992). Since most of the social benefits of wetlands are not captured by the private landowner, one may fail to adequately consider them when deciding the fate of a particular wetland. The divergence between private interests and public benefits has raised concern that wetlands are undervalued by the market, leading to wetland conversion rates exceeding the socially optimal level (Leitch and Danielson 1986). To correct for the undervaluing of wetlands by the market and their consequent excessive rate of loss, the federal government has taken steps toward protection and preservation (Baltezore et al. 1991).

[1] Refer to discussions of the Environmental Kuznets Curve for more on this relationship.

Numerous federal programs (beginning with the *Swamp Lands Acts* of 1849, 1850, and 1860) providing direct incentives to convert wetlands to agricultural production have been curtailed (Leitch 1989). Although the data necessary to estimate the full social value of wetlands are currently incomplete, conserving wetlands is recognized as being in the public interest (Heimlich et al. 1998).

When knowledge is imperfect, markets may be inefficient. Therefore, a better understanding of the land price impact of wetlands, wetland easements, and hunting/recreational sales is important to market participants, such as government agencies and private conservation organizations, to ensure that fair prices are paid for easements, and so policy makers can better design programs and regulations associated with farmland use. This information should also be helpful in the decision-making processes of farmland owners when deciding whether or not to participate in easement programs. Finally, the impact of hunting/recreational sales on farmland prices is important not only to farmers, but also to sportsmen in their competition for scarce wildlife resources and to the general public because of the contribution hunters and other outdoor enthusiasts provide the state economy.

Objectives

The primary objectives of this project were: (1) to estimate the land sale price impact of temporary and semi-permanent wetlands, (2) to estimate the land sale price impact of US Fish and Wildlife Service wetland easements, and (3) to estimate the land sale price impact of land sold for hunting/recreational purposes. This study estimates

these price impacts (i.e., implicit prices) in four North Dakota counties in the Prairie Pothole Region.

Methods

The monetary contribution (i.e., marginal implicit prices or price impact) of the attributes of a differentiable product (such as farmland) to the price of the product can be estimated using basic statistical tools such as Ordinary Least Squares Regression. Three stepwise hedonic (price-attributes) multiple regression models were designed after Shultz and Taff (2004) to estimate how wetlands, wetland easements, hunting land purchases, sale size, and income variables affect agricultural land values for four North Dakota counties (McIntosh, Burleigh, Kidder, and Sheridan) in the Prairie Pothole Region. A farmer's bid for a parcel of farmland that he considers to have no other potential uses than production agriculture (i.e., a simplifying assumption) will depend on expected return from agricultural production over time (Palmquist and Danielson 1989, Shultz and Taff 2004a). The models were applied to aggregate data from the four study area counties. The usefulness of the models to explain the variation of farmland prices was determined using correlation of multiple determination (R^2) values, model F statistics, parameter F-values, Cp criterion, and the size and direction of each explanatory variable in the models. Multicollinearity was assessed using Pearson Correlation Coefficients.

Data

County assessors from the four-county study area provided information on 411 recorded land sales judged to be arms-length (i.e., not a sale to a relative) and non-forced sales, and for agricultural purposes. Of this number, 68 (17% of all sales) sales were removed from the study because aerial photographs of the sale parcels revealed the presence of substantial buildings with the potential to increase sale price, leaving 351 sales to be included in this study.

Data for variables, size of the sale (*SaleAc*) and year of the sale *(Year)* were obtained from county records provided by county tax assessors. Sale size was expected to have a negative impact on sale price per acre because a large total cost is expected to decrease the number of potential buyers, and thereby reduce competitive bidding (Palmquist and Danielson 1989). However, as the number of large-scale farms in a county or area increases, the effect of sale size may decrease. Also, an inflationary increase in land values was expected over the five-year course of the study. In other words, land was expected to increase in nominal value simply due to inflation.

Average productivity of sale parcels was represented by gross revenue per acre (*Rev/Ac*) of crop and pasture land based on soil-specific spring wheat and forage yield estimates. Crop and rangeland acreage from Landstat imagery classifications provided by the National Agricultural Statistics Service (NASS 2005), crop yield estimates from the Soil Survey Geographic Database (SSURGO) digital soil survey of the Natural Resource Conservation Service (NRCS 2005), and the statewide average spring wheat and grass (i.e., other) hay prices for the year of the sale were used to estimate the gross revenue per acre of each sale parcel. Farm subsidies were not included in the gross

revenue estimate because farm subsidies are related to production levels and would not affect the relative rankings of land productivity as used in this study. An examination of the underlying data indicated these variables were independent so the final estimates of the impacts of these three variables were unaffected by the exclusion of subsidies (Shultz and Taff 2004). It is expected that gross revenue will have a positive effect on sale prices because agricultural producers are assumed to be profit maximizers.

Digitized sale boundaries were overlaid with the National Wetland Inventory (NWI 2005) to estimate the acres of wetlands in each sale parcel. An estimation of hydrologic condition of wetlands was made by overlaying NWI wetland polygons with NASS satellite imagery for the years 2001 to 2003. If standing water was visible throughout the growing season for three consecutive years, the wetland was classified as permanent. Wetlands that were dry for most of the growing season were classified as temporary. Easement acreage (*Dease*) within sale parcels was estimated by overlaying the digitized sale boundaries with GIS-based overlays of USFWS easement tracts. Both eased and non-eased wetlands were distinguished. Further, both types of wetlands were distinguished on the basis of hydrologic condition (permanent or temporary). Eased and non-eased wetlands are expected to reduce agricultural land sale prices because of lost income when they are too wet for agricultural production. Also, increased agricultural production costs may result from the inefficiencies of farming around wetlands and the constraints imposed by the easements (Shultz and Taff 2004).

The implicit price of wetlands was anticipated to be equal to buyer and seller perceptions of the amount of forgone net income plus net drainage costs. Permanent (*PermAc*) wetlands were expected to have larger negative impacts on sale prices than

temporary (*TempAc*) wetlands because temporary wetlands may be used for agricultural production during dry years, whereas permanent wetlands are usually too wet to be farmed. USFWS easements allow wetlands to be farmed when they dry up naturally.

Eased wetlands are also expected to reduce sales prices due to forgone agricultural income. The price impact of eased wetlands is expected to be larger than non-eased wetlands because the option to convert eased wetlands to other uses has been permanently shifted to FWS. However, the drainage option value in the study area is expected to be low since the majority of farmers participate in Federal farm programs which, according to Swampbuster provisions, preclude drainage if program benefits are accepted.

Another factor considered to have an impact on farmland prices was the purchase of a farmland parcel primarily for hunting/recreational (*DHunt*) purposes. Farmland sales information was used to identify purchasers whose address was one of North Dakota's larger cities (Fargo, Grand Forks, Jamestown, Bismarck, Mandan, Dickinson, Minot, or Williston) or was outside the state of North Dakota, and therefore were considered potential buyers of farmland primarily for hunting or recreation purposes. To determine the motivation for purchase, a questionnaire was sent to the out-of-state and city buyers. If potential hunting land purchasers failed to respond to the mailed survey, an attempt was made to survey them by phone. A total of 38 potential hunting land buyers were identified. Local real estate agents had previously identified 9 sales as hunting land sales. Survey letters were sent to the 38 potential hunting land buyers with 8 completed and returned, 5 of which were hunting sales. Telephone surveys were conducted for the remaining landowners, which identified 12 additional hunting sales. Thus, 17 (45%) of

the 38 potential hunting sales were confirmed hunting sales. In all, 26 sales were identified as bona fide hunting sales: 9 by local real estate agents, 5 by mailed survey, and 12 by telephone survey.

Model Variables

Model attributes included sale characteristics, productivity measures of crop and pasture land, wetland characteristics, wetland easements, and buyer characteristics (hunter vs. nonhunter). These explanatory variables were regressed against farmland sale price per acre.

The Dependent Variable: Farmland Sale Price per Acre.

The dependent variable in all three models was the average, per acre price of farmland based on the observed per acre sale prices of land sold from 2000 to 2004. The models used arm's length market sales data obtained from county assessors with family and forced sales already removed. In addition, 68 sales were removed because of the presence of buildings that may impact sale price. Information contained in the records included total sale acres, sale price of the transaction, and the legal description of the parcel. No sales less than 40 acres were included in the sample. During this time period there were a total of 351 useable sales collected: 57 for Burleigh County, 49 for Kidder County, 190 for McIntosh County, and 55 for Sheridan County.

Explanatory Variables

Three similar models were tested to estimate the effect of wetlands, wetland easements, and hunting sales on the price of North Dakota farmland. The difference in the models was the way categories of wetlands were grouped. Model 1 included 4

categories of wetlands, Model 2 included two categories, and Model 3 collapsed all categories of wetlands into a single group. All models included variables for year of sale, average revenue per acre, acreage of sale, whether or not the sale was a hunting sale, and whether or not an easement was associated with the sale.

Results

Selected characteristics of land sales were analyzed in this study using two groups of sales: (1) farmland sales and (2) hunting or recreation land sales. The hunting land sales were evaluated separately and according to the same criteria to determine if there are differences that distinguish hunting land sales from farmland sales. Based on a comparison of t-tests, F statistics, R^2 values, and C(p) criterion for each, Model 3 was the most useful for explaining the variation in farmland prices (Table 1).

TABLE 1
A SUMMARY OF EXPLANATORY VARIABLES FOR MODEL 3

VARIABLE	DESCRIPTION	EXPECTED IMPACT ON FARMLAND SALE PRICE
Year	Year of the sale: 2000 to 2004	+
SaleAc	Size of the sale (acres)	-
RevAc	Gross revenue ($/ac)	+
TWet	Total of all wetland acres	-
DEase	An easement existed on the parcel (yes or no)	-
DHunt	The sale was a hunting sale (yes or no)	+

Characteristics of Land Sales

Wetlands (temporary and permanent) existed on 81% of the sale parcels and represented 8% of sale acreage (Table 2). Wetland easements were characteristic of 166 sales (41%) and accounted for 31% of the land sold.

TABLE 2
A SUMMARY OF LAND SALE PARCELS

	ALL SALES (N = 351)		NON-EASED SALES (N = 185)		EASED SALES (N = 166)		ALL HUNTING SALES (N = 26)	
	MEAN	S.D.	MEAN	S.D.	MEAN	S.D.	MEAN	S.D.
PARCEL PRICE ($)	69003	61507	67072	70814	71156	49233	56980	38611
SIZE (AC'S)	271	200	240	196	306	200	222	122
PRICE ($/AC)	262	99	283	109	238	81	259	107
GROSS REVENUE ($/AC)	75	27	79	25	71	28	63	28
CROPLAND (%)	45	34	47	34	42	33	38	29
PASTURELAND (%)	51	34	51	34	51	33	48	31
ALL WETLANDS (%)	8	11	6	8	11	14	17	15
PERMANENT WETLANDS (%)	4	9	2	6	6	11	10	15
TEMPORARY WETLANDS (%)	5	8	4	6	6	10	7	12
EASEMENTS (% OF SALES)	47						58	
EASEMENTS (% OF SALES TRACTS)	31	44			65	43	46	48
EASEMENTS ON PERMANENT WETLANDS (% OF SALES TRACT)	3	9			5	11	6	10
EASEMENTS ON TEMPORARY WETLANDS (% OF SALES TRACT)	1	3			3	4	2	3

The average sale price for all sales was $262/acre: $283/acre for non-eased sales (sales without easements) and $238/acre for eased sales (sales that included easements) (Figure 1). Thus, the presence of an easement was associated with a 16% reduction in farmland sale price. However, this disparity of sale price between eased sales and non-

eased sales may be partially explained by the lower productivity of land with easements.

The productivity of eased sales was 10% less than the productivity of non-eased sales ($79/acre vs. $71/acre). Nominal average sale prices increased from $220 per acre in 2000 to $327 per acre in 2004. This aggregate increase of 49%, or 10% per year, is higher than the average increase in cropland values for these same counties as reported by NASS over the same time period (29% over the five year period or 6% per year).

Sales containing a mixture of cropland and pastureland (not less than 15% of sale designated as either cropland or pastureland and not more than 85% of the sale designated as either cropland or pastureland) were more common (49%) than either sales comprised principally of cropland (22% of the sales had more than 85% of the land devoted to raising crops) and sales comprised principally of pastureland (28% of the sales had more than 85% of the sales tracts designated as pastureland). Cropland sale prices averaged $295/acre, pasture sales averaged $219/acre, and mixed sales averaged $272/acre.

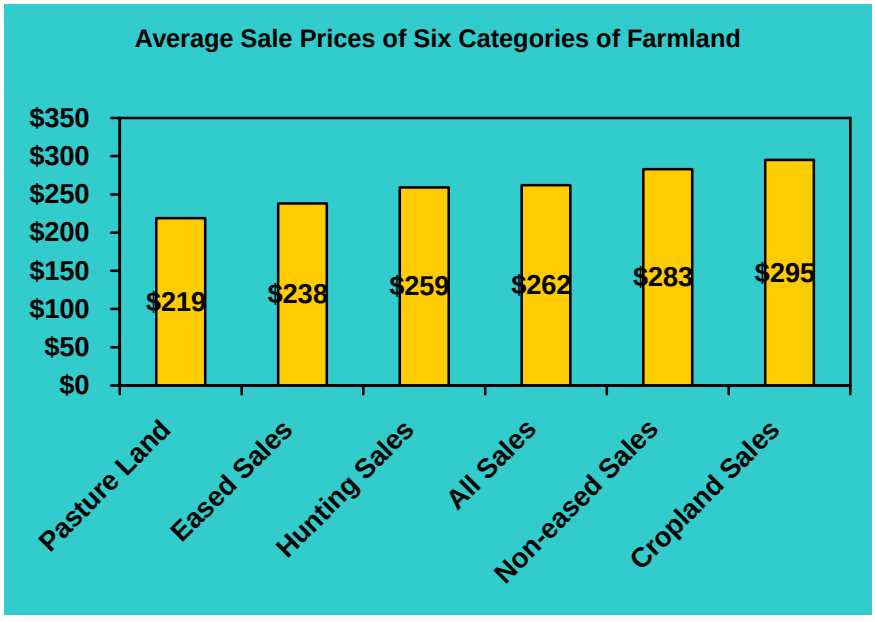

Figure 1. Average Sale Prices of Six Categories of Farmland

On average for all sales, permanent wetland acreage (4% of all sale acres) was nearly the same as temporary wetland acreage (5% of all sales acres). Overall, 31 percent of sales tracts were recorded as wetland easement acreage. Easements were associated with 75 percent of the permanent wetlands and 20 percent of the temporary wetlands. Of the sold parcels with easement contracts, 65 percent of the land (including 83% of the permanent wetlands and 50 percent of the temporary wetlands) was under easement.

Thus, for every 100 acres of land sold, 31 acres were under easement and the remaining 69 acres were non-eased. Of the easement acres, 3 acres were permanent wetland, 1 acre was temporary wetland, and 27 acres were upland (i.e., eased farmland). Of the non-eased acres, 1 acre was permanent wetland, 4 acres were temporary wetland, and 64 acres were upland (Figure 2).

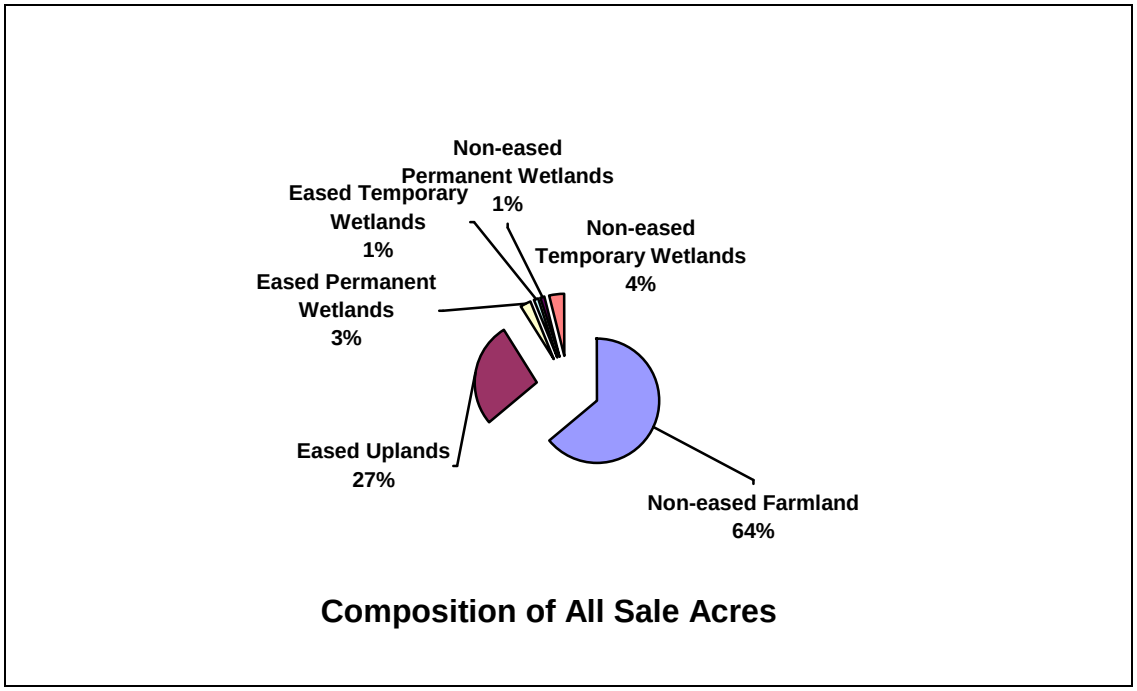

Figure 2. A Summary of Six Categories of All Sale Acres

Similarly, for every 100 acres of eased sales, 65 acres were under easement and 35 acres were non-eased farmland. Of the easement acres, 5 acres were permanent wetland, 3 acres were temporary wetland, and 57 acres were uplands. Of the non-eased acres, 1 acre was permanent wetland, 3 acres were temporary wetland, and 31 acres were farmland (Figure 3). Finally, for every 100 acres of non-eased sales, there were 94 acres of farmland, 2 acres of permanent wetland, and 4 acres of temporary wetland.

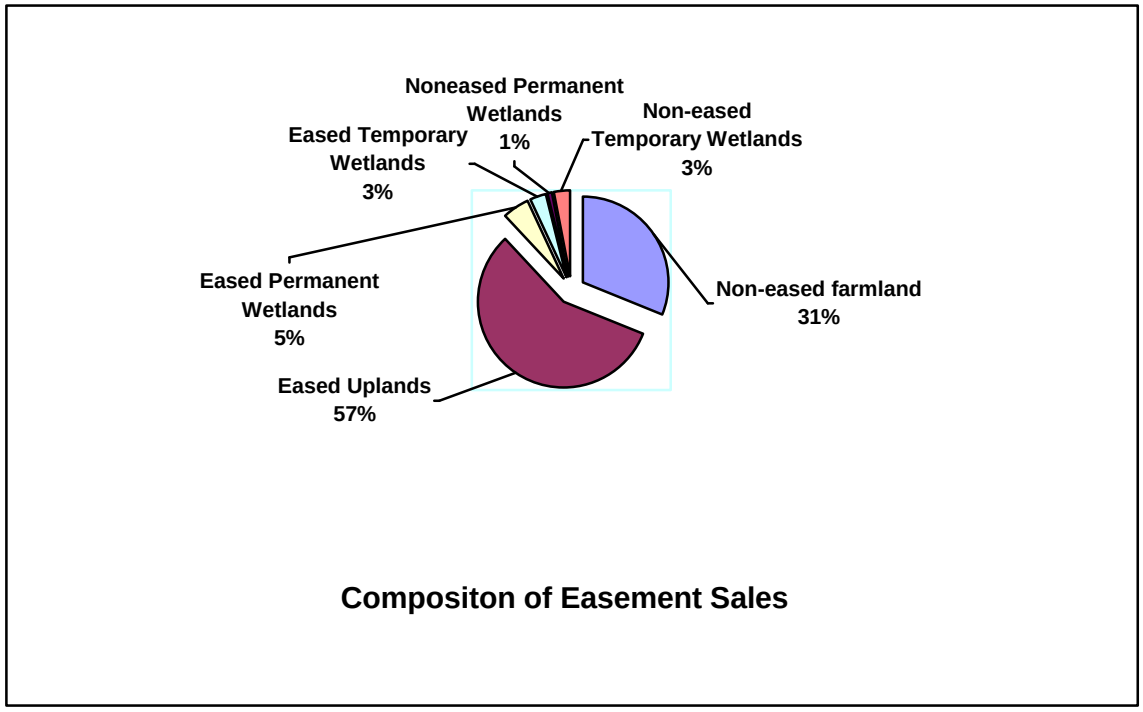

Figure 3. A Summary of Easement Sales in Six Categories

Characteristics of Hunting Sales

The average sale price for all hunting sales was $259/acre: $239/acre for non-eased sales and $273/acre for eased sales (a 14% increase for eased sales) (Table 3). The increase in land value for sales with an easement suggests hunting land buyers are

unconcerned with the potential negative financial impact of easements and perhaps even value the easement conditions.

TABLE 3
A SUMMARY OF HUNTING SALE PARCELS

	ALL HUNTING SALES (N = 26)		NON-EASED SALES (N = 11)		EASED SALES (N = 15)	
	MEAN	S.D.	MEAN	S.D.	MEAN	S.D.
PARCEL PRICE ($)	56980	38611	48255	23790	63379	46414
SIZE (AC'S)	222	122	205	81	234	147
PRICE ($/AC)	259	107	239	95	273	116
GROSS REVENUE ($/AC)	63	28	67	34	61	24
CROPLAND (%)	38	29	29	28	46	30
PASTURELAND (%)	48	31	56	34	40	28
ALL WETLANDS (%)	17	15	18	17	17	15
PERMANENT WETLANDS (%)	10	15	10	19	10	12
TEMPORARY WETLANDS (%)	7	12	8	8	7	14
EASEMENTS (% OF SALES)	58		58			
EASEMENTS (% OF SALES TRACTS)	46	48			79	36
EASEMENTS ON PERMANENT WETLANDS (% OF SALES TRACT)	6	10			10	12
EASEMENTS ON TEMPORARY WETLANDS (% OF SALES TRACT)	2	3			3	4

Wetlands (eased and non-eased) existed on 100 percent of the sale parcels and made up 17 percent of the sold acreage (compared to 8% of all sales). Wetland easements were associated with 15 sales (58% of all hunting sales) and accounted for 46 percent of the sold hunting sale land. The most hunting sales occurred in McIntosh and Sheridan Counties (9 each) followed by Kidder (6) and Burleigh (2).

The gross revenue of the hunting sales was $63/acre compared to $75/acre for all sales (a 16% reduction in productivity for hunting land). The ratio of gross annual revenue of hunting land to the purchase price of hunting land is 1: 4.11. This compares to a ratio of 1: 3.49 for all sales of gross annual revenue to purchase price (Table 4). Thus, relative to the productivity of the sale parcel, hunters are paying 18% more for hunting land than the average price for all sales.

TABLE 4
RATIO OF PRICE ($/ACRE) TO GROSS REVENUE ($/ACRE)

	Price/Gross Revenue
All Sales	3.49
All Eased Sales	3.35
All Non-eased Sales	3.58
Hunting Sales	4.11
Eased Hunting Sales	3.57
Non-eased Hunting Sales	4.48

The unadjusted (nominal) value of average sale prices increased from $242/acre in 2000 to $329/acre in 2004. This cumulative increase of 36% (7% annually) compares to 49% for all sales (10% annually) and 29% (6% annually) over the same time period for the four study counties as reported by NASS.

Across the entire sample of hunting sales, parcels containing a mixture of pastureland and cropland were the most common: 14 sales (54%) were a mixture of cropland and pastureland (more than 15% cropland or pastureland and less than 85% cropland or pastureland). Of the remaining sales, 7 (27%) were principally pastureland

(more than 85% pastureland) and 5 (19%) were principally cropland (more than 85% cropland).

On average for the hunting parcels sold, permanent wetland acreage (10%) was larger than temporary wetland acreage (7%). Easements were associated with 60 percent of the permanent wetlands and 29 percent of the temporary wetlands. Of the 14 sales with easement contracts (54%) 46 percent of the land was under easement.

Thus, for every 100 acres of hunting sale land, 46 acres were under easement and 54 acres were without easement restrictions. Of the non-eased acres, 4 acres were permanent wetland, 5 acres were temporary wetland, and 45 acres were farmland. Of the eased acres, 6 acres were permanent wetland, 2 acres were temporary wetland, and 38 acres were uplands (Figure 4).

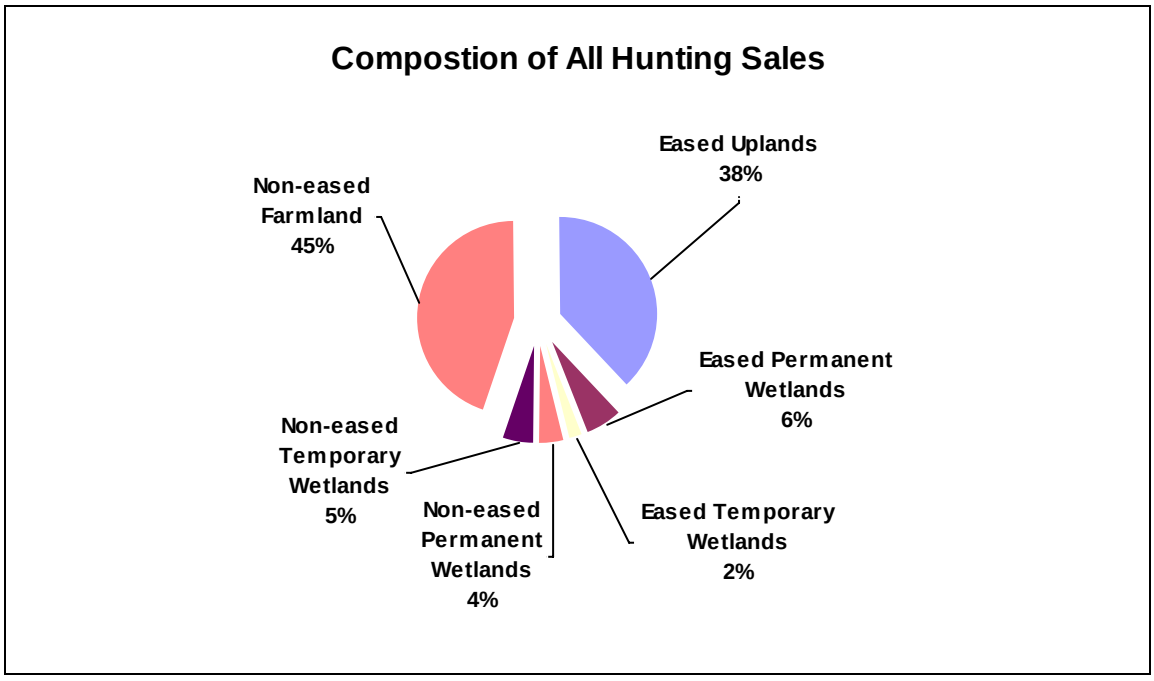

Figure 4. A Summary of All Hunting Sales in Six Categories

Similarly, for every 100 acres of eased hunting sale land: (1) 79 acres were under easement and 21 acres were without easement restrictions. Of the easement acres, 3 acres were temporary wetland, 10 acres were permanent wetland, and 66 acres were uplands. Of the non-eased acres, 4 acres were temporary wetland, there were no permanent wetland acres, and 17 acres were farmland (Figure 5). Finally, for every 100 acres of non-eased sales there were 82 acres of farmland. Of the remaining acres, 8 acres were temporary wetland and 10 acres were permanent wetland.

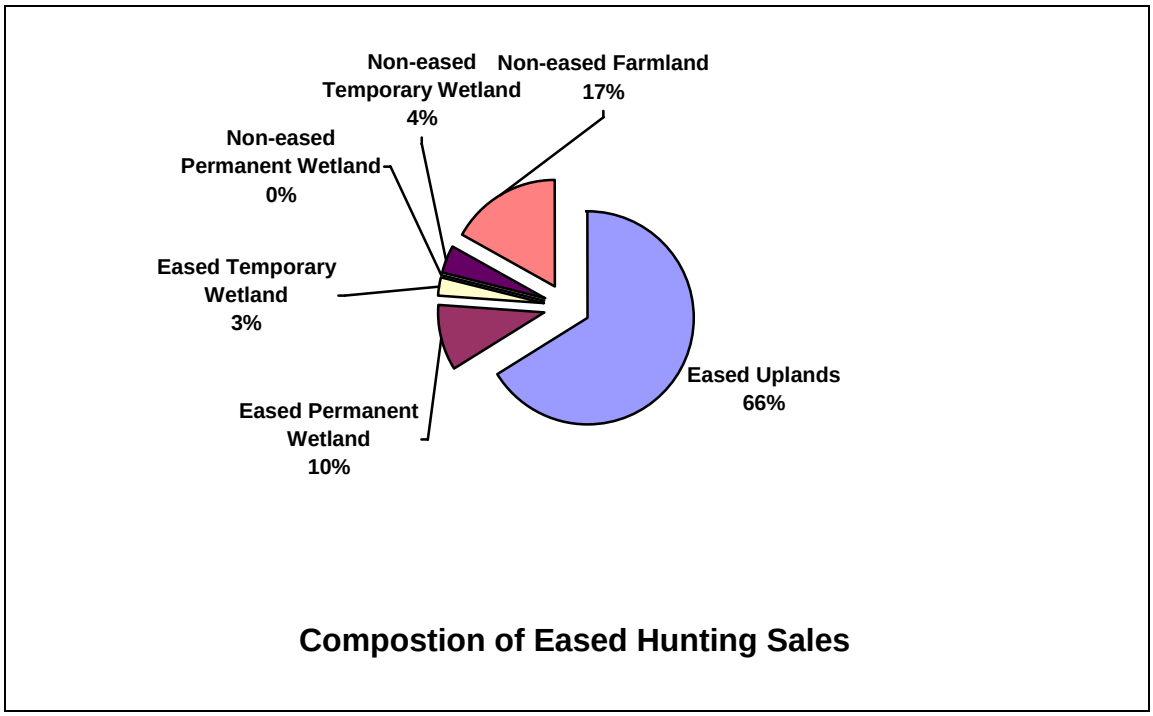

Figure 5. A Summary of Eased Hunting Sales in Six Categories

Three models estimating the implicit prices of wetlands, wetland easements, hunting sales, and other factors

Model 1 was designed specifically to estimate the implicit prices of easements covering temporary and permanent wetlands, following Shultz and Taff (2004). The seven quantitative independent variables included in the model were: year of the sale (a

measure of inflation), sale acreage, average revenue per acre, the number of permanent wetland acres not covered by an easement, the number of permanent wetland acres covered by an easement, the number of temporary wetland acres not covered by an easement, and the number of temporary wetland acres covered by an easement. There were two qualitative variables included in the model: whether or not the sale was associated with a USFWS wetland easement, and whether or not the sale was a hunting sale. Stepwise regression ($\alpha = 0.10$) retained four of the nine variables: average revenue per acre, year of the sale, non-eased temporary wetland acres, and whether or not the sale was associated with an easement. According to Model 1, the price of an acre of non-eased temporary wetland was $156 and the presence of an easement reduced the average per acre sale price by $32. The R^2 value was .23 and the Cp criterion was 3.66.

We assumed the price of an easement covering a permanent wetland is the difference in prices between two similar wetlands with and without an easement. It was similarly hypothesized that the price of an easement covering a temporary wetland would be the difference in prices between two similar temporary wetlands with and without an easement. However, the removal from the model of three of the four categories of wetlands by stepwise regression precluded the use of this model to estimate the prices of easements covering permanent and temporary wetlands. Thus, a second model was tested with wetlands grouped in two categories (permanent and temporary) to ascertain if the larger wetland sample sizes had a statistically significant on the price of farmland.

Model 2 was designed to estimate the implicit prices of permanent and temporary wetlands without distinguishing easement condition. The five independent variables were year of the sale, sale acreage, average revenue per acre, permanent wetland acres,

and temporary wetland acres. The two qualitative variables were whether or not the sale was associated with an easement and whether or not the sale was a hunting sale. Stepwise regression ($\alpha = 0.10$) retained four of the seven variables: year of the sale, whether or not the sale was associated with an easement, average revenue per acre, and the number of temporary wetland acres. According to Model 2 the presence of an easement reduced average per acre price by $28 (11%) and an acre of temporary wetland had a market price of $183. The R^2 value was .23 and the Cp criterion was 4.3. A final model was designed with all wetlands in a single group.

Model 3 was designed to estimate the implicit price of wetland without distinguishing hydrologic or easement condition. The three quantitative variables were year of the sale, average revenue per acre, and the total wetland acres. The two qualitative variables were whether or not the sale was associated with an easement and whether or not the sale was a hunting sale. Stepwise regression ($\alpha = 0.10$) retained all of the quantitative variables, and the qualitative variable for the presence of an easement. According to Model 3, the presence of a wetland easement reduced the average per acre price of farmland by $26 (10%), and an acre of wetland had a market price of $192. For each additional 1 dollar in revenue per acre the price of an average acre of farmland increased by $0.91. Land prices increased by $17 per acre each year of the study due to inflation (Table 5). The R^2 value was .23 and the Cp criterion was 5.4. Hunting sales were not statistically significant in any of the three models. A comparison of the R^2 values, Cp criterion, p-values, and F-values of the 3 models indicate Model 3 provides the best explanation of the variation of farmland price.

TABLE 5

MODEL 3 REGRESSION RESULTS

	COEFFICIENT	STD. ERROR	F-VALUE	*P*-VALUE
MODEL 2: THE IMPLICIT VALUE OF EASEMENTS (R^2 = .23, N = 351, CP = 5.36, α = 0.10)				
Year (unit = year)	17.38	3.66	22.52	<.0001
RevAc (unit = $/ac)	0.91	0.19	21.77	<.0001
TWet (total wetland acres)	-.016	0.23	3.77	0.0530
DEase (discrete variable, 1 if present, 0 if not)	-26.10	9.85	7.02	0.0084
Intercept	177.03	17.59	101.33	<.0001

Conclusions

This research was conducted with primary focus on three working hypotheses: (1) wetlands reduce the sale price of farmland, (2) wetland easements reduce the sale price of farmland, and (3) land bought for hunting/recreational purposes has a higher purchase price than land sold solely for agricultural production. Easements and wetlands had the expected effect on farmland prices. The presence of a wetland easement reduced the average per acre price of farmland by $26 (10%), and an acre of wetland had a market price of $192 (73% of the price of an average acre of farmland). Contrary to expectations, a sale made primarily for hunting/recreational purposes did not have a statistically significant effect on land prices.

Increased agricultural productivity had a positive impact on sale price. As expected, land prices increased over the time frame of the study, due to both inflation and demand factors.

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