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Wetland Management

LANDOWNERS' PERCEPTIONS RELATED TO WETLAND REGULATORY POLICY IN COASTAL LOUISIANA

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Abstract: Coastal wetlands in Louisiana are over 75% privately owned. Activities conducted in wetlands are primarily regulated through both the Clean Water Act (Section 404) and the Coastal Zone Management Act (CZMA). The purpose of this study was to investigate coastal landowners' perceptions related to wetland regulatory policy and use the results in the development of future, more workable wetland regulatory policy in Louisiana and the United States (see recommendations section). Regulatory program concerns most often listed by private landowners include: 1) acceptable definition of a wetland remains unsettled; 2) inconsistencies caused when two or more government agencies or programs issue conflicting wetland determinations on the same tract of land; 3) delays in obtaining a wetland determination; 4) delays in obtaining a wetland permit decision; 5) cost of permit and/or permit requirements too high; 6) loss of private property rights due to protection of public wetland benefits; and 7) the issue of regulatory "takings" without just compensation (under the 5th Amendment of the Constitution).

INTRODUCTION

Coastal wetlands in Louisiana are over 75% privately owned. Activities conducted in wetlands are primarily regulated through both the Clean Water Act (Section 404) and the Coastal Zone Management Act (CZMA). In an effort to learn more about landowners' perceptions related to the above issues and wetland regulatory policy issues in particular, a descriptive research study was conducted in early 1995. The purpose of this study was to investigate coastal landowners' perceptions related to wetland regulatory policy and use the results in the development of future, more workable wetland regulatory policy in Louisiana and the United States (see recommendations section). Specific objectives included:

- 1) Determine coastal landowners' perceptions related to wetland regulatory policy, economic outlook of wetland ownership, and key wetland landowner issues/concerns.
- 2) Determine if quality or condition of wetlands influences landowners' regulatory policy perceptions.
- 3) Compare the regulatory policy perceptions of small coastal landowners (owning 100–500 acres) and large coastal landowners (owning 2,500 acres or more).
- 4) Compare the regulatory policy perceptions of landowners from Cameron Parish, Terrebonne Parish, and St. Bernard Parish, Louisiana.

METHODS

The survey instrument (mailed questionnaire) developed for this study was intended to obtain specific landowner perceptions related to (1) wetland regulatory policy, (2) current and future natural resource-related economic perspectives, and (3) important issues and

concerns facing wetland owners. Content validity of the questionnaire was assured through pretesting. This field test allowed investigators to make necessary improvements to the questionnaire prior to initial mailing.

Coastal wetland landowners in three Louisiana parishes were queried to allow for parish comparisons. Parishes incorporated in the study were Cameron, Terrebonne, and St. Bernard, located strategically in the western, central, and eastern regions of Louisiana. The wetland landowner population within these parishes was stratified into two subgroups according to acreage owned. Landowners with coastal wetland landholdings between 100 and 500 acres were classified as small landowners, and those with 2,500 acres or more were classified as large landowners. Stratified sampling according to land holdings allowed for comparison of the perspectives of small and large coastal landowners.

To determine an appropriate sample size within each parish, the investigator obtained a list of all coastal wetland landowners from each parish tax assessor. Landowners were categorized, according to the amount of landholdings, into the two stratified subgroups listed above. The small population sample estimating formula was used to determine the appropriate small landowner size sample to be randomly selected from each parish. The lower number of large landowners in all three parishes required that a complete frame be used for this landowner size category.

A cover letter that introduced the landowner to the objectives of the study accompanied the questionnaire. Clear instructions (including return mailing procedures) were included both in the cover letter and on the questionnaire. The questionnaire was designed to allow for direct mailing without the use of an envelope. Return postage and a complete return mailing address were included on the back of the questionnaire "booklet."

In order to maximize response rate, the following follow-up steps were taken:

1) If the questionnaire was not returned in 7 to 10 days after the initial mailing, a postcard was sent to non-respondents as a friendly reminder. An offer was also made to send another questionnaire if one was needed.

2) A second follow-up packet was sent to non-respondents about 3 weeks after the original mailing. Included in this follow-up was a second letter explaining importance of response and another copy of the self-addressed, postage-paid questionnaire.

3) A final follow-up was sent to non-respondents approximately 6 to 7 weeks after the mailing of the original questionnaire. This mailing also included a letter explaining the importance of a response and a replacement questionnaire.

To determine if there were differences between the respondents and the non-respondents, a 10% random telephone sample of non-respondents was conducted. Seventeen non-respondents (weighted according to individual parish and landowner size responses) were selected. The wetland regulatory policy-related responses of the respondents and non-respondents were compared to see if the two groups differed significantly. Even though some significant differences were found, it should be noted that similar patterns of response frequencies within each variable were evident.

Each study objective was evaluated through the data analysis procedure summarized below:

Objective One—Using descriptive statistics, this objective was accomplished by reporting overall questionnaire findings, findings by parish groups, and findings by landowner wetland acreage category (small and large).

Objective Two—This objective was accomplished by asking respondents to rate the quality or condition of the wetlands they currently own based on a five-point Likert-type scale. The independent variable in this objective was the wetland quality/condition rating and the dependent variable was landowner wetland regulatory policy perceptions. Three statistical tests used to accomplish this objective, depending on the type of data collected and the number of categories, included: 1) The Pearson Product Moment correlation coefficient analysis (items treated as interval data), 2) the t-test (items measured on a dichotomous categorical scale), and 3) a one-way analysis of variance (ANOVA) with a Tukey's post hoc follow-up test (items with more than two categories).

Objective Three—For this objective the independent variable was landowner size category and the dependent variable was landowner wetland regulatory policy perceptions. A t-test was used for the items measured on a dichotomous categorical scale. A Pearson chi-square test was used to compare categorical wetland regulatory policy items in terms of their relationship to the variable land

size. For significant chi-square values, cross-tabulation tables were used to determine where differences existed between categorical frequencies.

Objective Four—The combination of each parish's small landowner random sample and the census sample of large landowners made up each parish study sample. The independent variable was landowner parish of wetland ownership and the dependent variable was landowner regulatory policy perceptions. For items where group means were compared, a one-way ANOVA and a Tukey's post hoc follow-up test were used to determine significant differences. The Pearson chi-square test was used to compare the frequencies of categorical wetland regulatory policy items. Cross-tabulation tables were also used to determine where significant differences existed.

Description of Sample

The overall response rate for the study was approximately 60% (209 overall mail survey respondents). This held true for landowners from both small and large land size categories. Cameron Parish landowners had the highest rate of response (68% or 85 respondents), and those in Terrebonne Parish had the lowest (52% or 58 respondents). The response rate in St. Bernard Parish was 61% (66 respondents).

Almost 60% of the overall respondents reported that they reside in the parish where they own wetlands. This was also true of both small and large landowners. Almost 50% of the St. Bernard landowners, however, reported that they resided in a parish other than the one where they own wetlands.

Over 80% of the overall respondents reported that they reside in Louisiana. Louisiana residency for large landowners (91%) was greater than that for small landowners (79%). All three parishes reported a Louisiana residency rate of approximately 80%.

The most common wetland type reportedly owned by study respondents was brackish marsh. The second most common type was fresh marsh. This held true in all wetland land size categories and parishes.

RESULTS

Objective One Findings (Perceptions regarding regulatory policy, economic outlook, and key issues/concerns)

A. Questions related to wetland permitting

Perceptions regarding federal Section 404 permit program.—On a scale ranging from 1 = very poor to 5 = excellent, the overall mean landowner rating for the federal Section 404 program was 2.09 (SD = 0.94) (less than adequate). Additionally, 29% indicated that they were not familiar with the program.

Perceptions regarding state Coastal Use Permit (CUP) program.—On a similar scale, the overall mean landowner rating for the state CUP program was 2.23 (SD = 0.93) (less than adequate). Approximately 34% also indicated that they were not familiar with the program.

Section 404 permit application.—Overall, more than 60% of the respondents indicated that they had never applied for a federal wetland permit. The majority of the large landowners, however, reported that they had applied for a permit in the past.

Section 404 permit denial.—Of the respondents that indicated that they had applied for a 404 permit, approximately 40% reported having a permit denied. The highest denial rate was reported by Cameron landowners (53%), and the lowest denial rate was reported by St. Bernard landowners (8%).

CUP application.—Overall, 63% of the respondents reported that they never applied for a CUP. Over 70% of the small landowners also reported never applying. Only 35% of the large landowners, however, reported never applying.

CUP denial.—Of the respondents who indicated they had applied for a CUP, almost 80% indicated that they never had a permit denied.

Section 404 permit problems.—Overall, landowners reported “other” as the most important problem associated with obtaining a Section 404 permit. The most frequent “other” response was “don’t know.” The second most important problem identified by respondents was “delays in obtaining a decision.”

CUP problems—The most important identified problem associated with obtaining a CUP reported by coastal landowners was “other.” Here also the most frequent “other” response was “don’t know.” The second most important problem identified by respondents was “delays in obtaining a decision.”

Preferred federal wetland permit agency.—Overall, SCS (NRCS) received the highest percentage response when landowners were asked to indicate which federal agency should be responsible for wetland permitting in Louisiana.

State Section 404 assumption.—Almost 60% of all respondents indicated that they felt the state should assume Section 404 permitting authority from the federal government.

Preferred state Section 404 assumption agency.—Overall, the Louisiana Department of Natural Resources (DNR) received the highest percentage responses when landowners were asked to indicate which state agency should assume Section 404 permit authority.

B. Questions related to wetland definition

Preferred federal wetland determination agency.—SCS (NRCS) received the highest overall percentage responses when landowners were asked to identify the preferred federal wetland determination agency.

Wetland characteristics ranking.—Of the three primary physical wetland characteristics (hydric soil, hydrophytic vegetation, and wetland hydrology), wetland hydrology was perceived most important by all respondents. Hydric soil was perceived to be the least important.

C. Questions pertaining to landowner perceptions of wetland regulatory agencies

Federal agencies’ receptiveness ranking.—On a scale ranging from 1 = most receptive down to 5 = least receptive, respondents perceived SCS (NRCS) as being most receptive towards private landowners’ goals and objectives (mean = 1.92; SD = 1.30).

State agencies’ receptiveness ranking.—On a similar scale, respondents perceived the Louisiana Department of Agriculture and Forestry (LDAF) as being most receptive towards private landowners’ goals and objectives (mean = 2.33; SD = 1.23).

D. Questions related to wetland functions

Wetland function rankings.—When asked to rank nine wetland functions according to their importance to landowners or land managers on a scale of 1 = most important to 9 = least important, erosion control (mean = 3.41; SD = 2.21), flood control (mean = 3.51; SD = 2.20), and storm surge buffer (mean = 3.51; SD = 2.40) were perceived as being most important. Non-consumptive tourism related activities were perceived as being least important (mean = 7.73; SD = 2.01).

Wetland use harm rankings.—When asked to rank 10 wetland uses according to their potential for harming wetlands on a scale of 1 = most harmful down to 10 = least harmful, oil and gas exploration and production was perceived as the most potentially harmful (mean = 3.60; SD = 3.06). Waterfowl hunting was perceived as the least potentially harmful (mean = 7.09; SD = 2.43).

E. Questions related to coastal wetland-related economic decisions

Wetland revenue source rankings today.—When asked to rank 10 wetland-related revenue sources regarding their importance **today**, with 1 = most important to 10 = least important, oil and gas exploration and production was perceived as being most important (mean = 1.94; SD = 2.01). The least important revenue source today was non-consumptive tourism-related business enterprises (mean = 8.32; SD = 2.36) followed closely by mariculture (mean = 8.06; SD = 1.76).

Wetland revenue source rankings in the future.—When asked to rank 10 wetland related revenue sources as to their importance in the **future** using the same ranking scale as above, again, oil and gas exploration and production was perceived as being most important (mean

= 2.05; SD = 2.37). Additionally, non-consumptive tourism-related business enterprises were also perceived as being the least important future revenue source.

Per acre annual gross surface revenue.—The highest proportion of respondents (38%) reported receiving no annual revenue off the surface of their wetlands, followed closely by respondents reporting less than \$10 per acre (34%).

Government assistance program rankings.—When asked to rank five potential landowner-oriented government assistance programs with 1 = most preferred down to 5 = least preferred, “tax breaks” were most preferred by all respondents (mean = 2.30; SD = 1.42). The least preferred landowner assistance program was “outright government purchase” (mean = 3.80; SD = 1.64).

Attitudes on permanent government conservation easements.—Overall, the majority of the respondents (60%) indicated that they opposed permanent easements. Large landowners and St. Bernard landowners, however, reported a higher percentage of responses favoring permanent easements.

Future plans for wetland acreage.—Almost 80% of the overall respondents indicated that they planned to maintain ownership of their coastal wetlands in the future.

Future wetland use ratings.—When asked to rate the economic importance of six wetland uses in the future on a rating scale ranging from 1 = extremely important to 5 = not important, oil and gas exploration received the highest rating (mean = 2.90; SD = 1.29). The wetland use perceived as being the least important was non-consumptive tourism-related uses (mean = 4.11; SD = 1.06).

Wetland regulatory policy and “takings”.—Over 60% of all respondents indicated that they believed current wetland regulatory policy in the U.S. may be approaching a “takings” under the 5th Amendment of the Constitution.

F. Questions related to wetland quality

Wetland acreage loss due to erosion.—Overall, respondents reported that they lost approximately 14% of their wetland holdings due to erosion or other wetland loss causes. St. Bernard landowners, however, reported a higher wetland loss percentage (36%) than both the Terrebonne (15%) and Cameron (7%) landowners.

Landowners’ wetland quality classification.—Overall, respondents rated the overall quality or condition of their wetlands as being between “somewhat poor” and “good” (mean rating of 2.61; SD = 1.01) on a rating scale where 1 = very poor and 5 = excellent.

G. Questions pertaining to issues of concern

Wildlife refuge location perceptions.—The majority of the respondents indicated that they were in favor of both the location of a wildlife refuge in the parish where they own wetlands (59% in favor) and adjacent to their property

(55% in favor). A higher proportion of the Terrebonne respondents, however, reported not favoring the location of a refuge adjacent to their property.

Important issues and/or needs facing landowners.—Through an open-ended question, respondents were asked to reveal what they perceived to be the most important issues and/or needs facing private landowners in Louisiana. Overall, the two most frequently listed issues of concern reported were 1) private property rights (29% of responses) and 2) coastal erosion (25% of responses).

Objective Two Findings (Influence of wetland quality on regulatory policy perceptions)

Three Pearson Product Moment correlation coefficients were found to be significant: (1) Higher perceived quality of wetlands tended to be associated with lower preference perceptions regarding permanent easements $\rho = 0.21, P = 0.01$); (2) higher perceived quality of wetlands tended to be associated with higher preference perceptions regarding tax breaks $\rho = -.17, P = 0.04$); and (3) higher perceived quality of wetlands tended to be associated with lower preference perceptions regarding long-term easements. Using Davis’ descriptors, all three significant correlation coefficients were described as a low association.

One item was also found to have significant differences in perceived overall quality of wetlands among its categories. Respondents who indicated that they had applied for a CUP had a higher wetland quality perception than those that had not applied ($t = 2.14, df = 156, P = .03$).

Objective Three Findings (Landsize category regulatory policy perception comparisons)

Nine comparisons of wetland regulatory policy and landsize were found to be significant. The five significant t-test values included the following items: (1) Small landowners expressed a higher receptiveness ranking for EPA than did large landowners ($t = -3.0, df = 151, P = 0.003$); (2) small landowners indicated a lower CUP program rating than did large landowners ($t = -2.51, df = 131, P = 0.01$); and (3–5) small landowners expressed lower receptiveness rankings for LDAF, SCS (NRCS), and DHH than did large landowners ($t = 2.50, df = 152, P = .02$); ($t = 2.32, df = 153, P = 0.02$); and ($t = 2.25, df = 144, P = 0.03$), respectively).

Objective 4 Findings (Parish regulatory policy perception comparisons)

Six items were found to be significantly different when the three geographic regions were compared via an ANOVA test: (1) Cameron respondents reported significantly lower preference rankings for the “outright government purchase” government assistance program

option for coastal landowners than both Terrebonne and St. Bernard respondents ($F = 11.50, P = .001$); (2) Cameron respondents reported significantly higher preference rankings for the "tax break" government assistance program option than St. Bernard landowners ($F = 5.95, P = 0.003$); (3) Cameron landowners reported significantly lower receptiveness rankings for DNR than did St. Bernard landowners ($F = 3.96, P = 0.02$); (4) Cameron and Terrebonne landowners reported significantly higher receptiveness rankings for SCS (NRCS) than did St. Bernard landowners ($F = 3.27, P = 0.04$); (5) Terrebonne landowners reported significantly lower receptiveness rankings for EPA than did St. Bernard landowners ($F = 3.08, P = 0.05$); and (6) Cameron landowners reported significantly lower ratings for the state Coastal Zone Management wetland permitting program than did St. Bernard landowners ($F = 3.12, P = 0.05$).

CONCLUSIONS

Based on the findings of this study, the following conclusions were drawn by the researcher. It should be noted, however, that these conclusions may only be applicable to landowners in the specified land size categories in Cameron, Terrebonne, and St. Bernard Parishes.

Federal Section 404 Wetland Permitting Program Perceptions

Coastal landowners generally rate the federal Section 404 wetland permitting program as less than adequate. This conclusion is based on the finding indicating an overall mean rating of 2.09 (SD = 0.94), where 1 = poor, 2 = less than adequate, 3 = adequate, 4 = more than adequate, and 5 = excellent. This gives quantifiable verification of opinions expressed by McBride (1992). He reported that Louisiana landowners are frustrated by the current dual wetland permitting system for conducting activities in wetlands.

Many coastal landowners are not familiar with the federal Section 404 wetland permitting program. This conclusion is based on the finding that almost one-third (29%) of the landowners responding to the questionnaire indicated that they were not familiar with the program.

Most small coastal landowners have never applied for a federal Section 404 permit, whereas most large landowners have. This conclusion is based on overall questionnaire findings showing 72% of the small landowners reporting never applying for a 404 permit and 53% of the large landowners reporting that they had applied.

Most landowners feel that the federal Section 404 permitting program should be assumed by the state of Louisiana. This conclusion is based on the finding that 60% of the respondents indicated this response. This

finding supports opinions expressed by McBride (1992) disputing the dual wetland permitting system now in place and recommending "one stop" wetland permitting (elimination of having to apply for both a federal 404 permit and a state CUP permit).

State Coastal Use Permit (CUP) Program Perceptions

Coastal landowners generally rate the state Coastal Zone Management wetland permitting (CUP) program as less than adequate. This conclusion is based on the finding indicating an overall mean rating of 2.33 (SD = 0.93), where 1 = very poor, 2 = less than adequate, 3 = adequate, 4 = more than adequate, and 5 = excellent. This finding supports conclusions made by McBride (1992) indicating large landowner frustration with the current dual wetland permitting program in Louisiana.

Small coastal landowners rate the state CUP program lower than do large landowners. This conclusion is based on findings indicating a significant t-test when the mean CUP ratings for the two land size categories were compared ($t = -2.51, df = 131, P = .01$).

Cameron coastal landowners rate the state CUP program lower than St. Bernard landowners. This conclusion is based on the finding indicating a significant F-ratio when the mean CUP program ratings for the three land size categories were compared and a Tukey's post hoc followup test was conducted ($F = 3.12, P = .05$).

Many coastal landowners are not familiar with the state CUP program. This conclusion is based on the finding that almost one-third of the landowners responding to the questionnaire reported that they were not familiar with the program.

Coastal landowners who have applied for a state CUP perceive their wetlands to be of higher quality than those who have never applied. This conclusion is based on a significant t-test when the perceived wetland quality mean rating for landowners who have applied for a CUP is compared to the perceived wetland quality mean rating for landowners who have never applied ($t = 2.14, df = 156, P = 0.03$).

Most small coastal landowners have never applied for a state CUP, whereas most large landowners have. This conclusion is based on overall questionnaire findings indicating 70% of the small landowners reporting never applying for a CUP and the highest proportion of the large landowners (47%) reporting that they have applied.

Federal Wetland Permitting Agency Perceptions

Of the five federal agencies considered, SCS (NRCS) is perceived by coastal landowners to be the most receptive toward private landowners' goals and objectives, and the agency landowners feel should be responsible for making wetland determinations and wetland permitting.

This conclusion is based on the finding that landowners give SCS (NRCS) the highest overall mean receptiveness ranking (mean 1.92; SD = 1.30), where 1 = most receptive and 5 = least receptive. Additionally, the highest proportion of the respondents selected SCS (NRCS) when asked which federal agency should be primarily responsible for making wetland determinations (41%) and wetland permitting (35%).

Of the five federal agencies considered, NMFS is perceived by coastal landowners to be the least receptive towards private landowners' goals and objectives. This conclusion is based on the finding showing landowners giving NMFS the lowest overall mean receptiveness ranking (mean = 4.05; SD = 1.00), where 1 = most receptive and 5 = least receptive.

When considering federal agencies' receptiveness toward private landowners' goals and objectives, small coastal landowners rank EPA higher than large landowners. This conclusion is based on the finding indicating a significant t-test when the mean EPA rankings for the two land size categories were compared ($t = -3.0$, $df = 151$, $P = .003$).

When considering federal agencies' receptiveness toward private landowners' goals and objectives, Cameron coastal landowners rank SCS (NRCS) higher than St. Bernard coastal landowners, and Terrebonne coastal landowners rank EPA lower than St. Bernard coastal landowners. This conclusion is based on the finding indicating a significant F-ratio when the mean SCS (NRCS) ($F = 3.27$, $P = .04$) and EPA ($F = 3.08$, $P = 0.05$) rankings for the three landowner regions were compared.

State Wetland Permitting Agency Perceptions

Of the five state agencies considered, the Louisiana Department of Agriculture and Forestry (LDAF) is perceived by coastal landowners to be the most receptive toward private landowners' goals and objectives. This conclusion is based on the finding that landowners gave LDAF the highest overall mean receptiveness ranking (mean = 2.33; SD = 1.23), where 1 = most receptive and 5 = least receptive.

When considering state agencies' receptiveness towards private landowners' goals and objectives, small coastal landowners rank LDAF, SCS (NRCS), and DHH lower than do large landowners.

This conclusion is based on significant t-tests when the overall mean receptive rankings for these three state agencies were compared by land size category ($t = 2.50$, $df = 152$, $P = 0.02$); ($t = 2.32$, $df = 153$, $P = 0.02$); and ($t = 2.25$, $df = 144$, $P = .03$), respectively).

When considering state agencies' receptiveness toward private landowners' goals and objectives, Cameron coastal landowners rank DNR lower than St. Bernard coastal landowners. This conclusion is based on a

significant F-ratio when the mean DNR receptiveness rankings for the three land size categories were compared ($F = 3.96$, $P = .02$).

Government Assistance Program Perceptions

When considering landowner-oriented government assistance programs, coastal landowners prefer tax breaks and direct coastal restoration funding over outright government purchase of wetlands. This conclusion is based on higher overall government assistance program mean rankings for the "tax break" (mean = 2.30; SD = 1.42) and "direct funding" (mean = 2.34; SD = 1.32) options than for the "outright government purchase" option (mean 3.80; SD = 1.64), where 1 = most preferred and 5 = least preferred. These findings support opinions expressed by McBride (1992) opposing government stewardship (ownership and/or management) of wetlands and supporting tax incentives for landowner-implemented wetland conservation projects.

Small coastal landowners generally do not favor permanent conservation easements, whereas large coastal landowners generally do favor permanent easements. This conclusion is based on overall questionnaire findings showing 63% of the small landowners were opposed to permanent conservation easements, while the largest proportion of the large landowners (49%) reported favoring permanent easements.

Coastal landowners with perceived higher quality wetlands have lower preference perceptions toward permanent and long-term easements and higher preference perceptions toward tax breaks.

This conclusion is based on findings indicating significant Pearson correlation coefficients between wetland quality perception rating and permanent easement ranking ($r = 0.21$, $P = 0.01$), long-term easement ranking ($r = 0.17$, $P = 0.05$), and tax break ranking ($r = -0.17$, $P = 0.04$).

Preference perceptions for the "outright government purchase" landowner assistance program option were lower for Cameron landowners than both Terrebonne and St. Bernard landowners; however, preference perceptions for "tax breaks" were higher for Cameron landowners than St. Bernard landowners. This conclusion is based on a significant F-ratio when the overall mean "outright government purchase" option rankings ($F = 11.50$, $P = 0.001$) and "tax break" option rankings ($F = 5.95$, $P = .02$) for the three landowner parishes were compared.

Wetland Function and Use Perceptions

Coastal landowners perceive erosion control as the most important wetland function. This conclusion is based on the finding that erosion control received the highest overall mean rank (mean = 3.41; SD = 2.21) among the nine wetland functions considered, where 1 = most important and 9 = least important.

Coastal landowners perceive oil and gas exploration and production as the most potentially harmful wetland use. This conclusion is based on the finding that oil and gas exploration and production received the lowest overall mean rank (mean = 3.60; SD = 3.00) among the 10 wetland uses considered, where 1 = most harmful and 10 = least harmful.

Most coastal landowners earn little or no income from the surface of their wetlands (not counting oil and gas leases). This conclusion is based on the finding that almost three-fourths of the landowners responding to the questionnaire indicated either "no revenue collected" (38%) or "< \$10/acre" (34%) when asked to estimate the per-acre yearly gross revenue obtained off the surface of their wetlands.

Coastal landowners perceive oil and gas exploration and production to be the most important wetland revenue source today and in the future. This conclusion is based on the findings showing oil and gas exploration and production to have the highest overall mean "today" and "future" ranking (mean = 1.94; SD = 2.01 and mean = 2.05; SD = 2.24, respectively).

Most coastal landowners plan to maintain ownership of their wetland properties in the future. This conclusion is based on the finding that over three-fourths of the landowners responding to the questionnaire indicated that they planned to maintain ownership of their wetlands.

Coastal landowners perceive wetland hydrology to be the most important wetland characteristic used to determine if an area is a wetland. This conclusion is based on the finding showing landowners giving wetland hydrology the highest overall mean ranking (1.85; SD = 1.11) when compared to hydrophytic vegetation (mean = 2.20; SD = 0.89) and hydric soil (mean = 2.35; SD = 0.91), where 1 = most important and 3 = least important.

Coastal landowners generally classify the overall quality of the wetlands they own or manage (based on vegetative health and stability, erosion control, saltwater intrusion, etc.) between somewhat poor and good. This conclusion is based on an overall perceived wetland quality mean rating of 2.61 (SD = 1.01), where, 1 = very poor quality and 5 = excellent quality.

Wildlife Refuge Location Perceptions

Most coastal landowners favor the location of a wildlife refuge in the parish where they own wetlands and adjacent to their wetlands property. This conclusion is based on the findings that the majority of the respondents reported favoring refuge location in the parish where wetlands are located (59%) and favoring refuge location adjacent to their wetlands property (55%).

Regulatory Policy and the "Takings" Issue Perceptions

Coastal landowners generally feel that current wetland regulatory policy in the U.S. may be approaching a "takings" under the 5th Amendment of the Constitution. This conclusion is based on the finding that almost two-thirds of the landowners responding to the questionnaire indicated that current wetland regulatory policy may be approaching a "takings."

Wetland Loss Perceptions

Louisiana coastal landowners have lost a significant amount of wetland acreage due to coastal erosion. This conclusion is based on respondents' reported acreage lost due to erosion. This finding is supported by the Louisiana coastal wetland loss rates reported by the U.S. Army Corps of Engineers.

St. Bernard coastal landowners perceive their wetland loss rates to be higher than both Terrebonne and Cameron coastal landowners. This conclusion is based on St. Bernard respondents reporting a higher loss rate (36%) than both Terrebonne (15%) and Cameron (7%) region respondents.

Perceptions of Most Important Issues/Needs Facing Wetland Landowners

The two most important issues facing private coastal wetland landowners are (1) private property rights and (2) coastal erosion. This conclusion is based on responses to an open-ended question asking coastal landowners to identify the most important issues and/or needs facing private wetland landowners in Louisiana. Approximately 29% of the 245 individual issues/needs listed by the 131 landowners responding to the open-ended question, dealt with the preservation of private property rights, and 25% of the individual issues/needs dealt with concerns about coastal erosion.

RECOMMENDATIONS

Based on the findings outlined above, the researcher makes the following 12 recommendations. It should be noted, however, that these recommendations may only be applicable to landowners in the specified land size categories in Cameron, Terrebonne, and St. Bernard Parishes.

Federal and state wetland regulatory programs, administered by the U.S. Army Corps of Engineers (COE) and the Louisiana Department of Natural Resources (DNR), respectively, should be modified to address the "less than adequate" perceptions held by Louisiana coastal landowners. Policy adjustments should address (1) ways to speed up wetland permitting decision-making process, (2) concerns associated with regulatory policy-caused loss of private property rights (the "takings" issue), and

(3) lack of landowner program familiarity. Both the COE and DNR should set and strictly adhere to maximum permit decision time limits that allow applicants to more accurately determine administrative time requirements. Additionally, federal and state statutes may be needed that protect landowners' pre-regulatory era investment-backed expectations when wetland regulations substantially (50% or more) reduce a landowner's property value or use. Lastly, lack of landowner familiarity with both federal and state wetland permitting programs may require that the COE and DNR provide funding to an appropriate educational agency to develop and implement more in-depth educational programs targeting coastal landowners (especially small landowners). Educational programs should include wetland functions and values, the permit application process, landowner options and responsibilities, agency responsibilities, estimated cost of process, and permit process time requirements. At the end of the permit application process, the COE and DNR should also consider sending each permit applicant a well-structured evaluation instrument that better identifies perceived permit application problems and suggested solutions.

The federal Section 404 wetland permitting program should be assumed by the state of Louisiana and administered by the Louisiana Department of Natural Resources-Coastal Management Division. This recommendation is based on the strength of coastal landowner support for state assumption, and the fact that DNR assumption could result in a single-agency, "one-stop-shopping" wetland permit program covering both federal and state requirements. To substantiate such a change, however, the opinions of landowners in other coastal and non-coastal parishes and pertinent non-government organizations would have to be queried.

Regardless of federal or state authorities, NRCS (SCS) should be designated as the primary federal agency responsible for making wetland determinations on private coastal wetlands in Louisiana. This recommendation is based on high landowner receptiveness rankings and wetland determination agency preferences for SCS (NRCS). The opinions held by landowners in other coastal and non-coastal parishes and pertinent non-government organizations would be needed prior to making any final policy changes.

With most landowners planning to maintain ownership of their coastal wetlands, future government assistance programs should focus on providing (1) tax breaks for voluntary wetland conservation projects implemented, and (2) direct wetland restoration funds made available to landowners. This recommendation is based on high landowner preferences for these two government assistance program options.

Large and St. Bernard landowner-oriented government assistance program options should include the availability of permanent conservation easements paying fair market

value in exchange for development rights. This recommendation is based on large and St. Bernard landowner support for permanent easements.

Outright government purchase of private wetlands paying fair market value should not be pursued as a priority landowner-oriented government assistance program option in coastal Louisiana. This recommendation is based on low preference rankings for the government purchase option and strong evidence that Louisiana landowners plan to maintain their wetland ownership in the future.

With oil and gas exploration and production perceived as the most important current and future revenue source for coastal landowners, and non-consumptive tourism enterprises considered the least important, an increased educational focus should be directed toward helping coastal landowners recognize the economic potential of non-consumptive tourism-related business enterprises. Increased landowner awareness of nature-based tourism attractions, such as birdwatching, nature trails, nature photography, boating (boat riding), and storytelling, will be critical to economic diversification and sustained economic growth in coastal Louisiana.

A tourism-oriented educational program for landowners should be designed by a legislatively authorized inter-agency task force. Task force representation should include Louisiana universities; the Department of Culture, Recreation and Tourism; the Louisiana Department of Wildlife and Fisheries; the Louisiana Sea Grant College Program; the Louisiana Landowners Association; the Louisiana Police Jury Association; the Louisiana Municipal Association; and the LSU Agricultural Center's Louisiana Cooperative Extension Service (LCES). Further study as to why coastal landowners do not see non-consumptive tourism-related enterprises as being important would be a crucial first step in the development of an effective educational program. Because of their extensive experience conducting landowner-oriented educational programs throughout the state, the Louisiana Cooperative Extension Service should be given the primary responsibility for implementing the education program once it is fully developed. The researcher further recommends that a formative evaluation program be implemented to assure sustained program success.

With the majority of small landowners not allowing commercial hunting enterprises, educational programs are needed that emphasize the economic potential of waterfowl hunting opportunities in coastal Louisiana. An effective educational program could be designed through a coordinated effort between the LDWF and LCES. Program components should include business management, liability insurance needs, marketing, waterfowl management, state and federal regulations, and hospitality training. With its extensive parish network, LCES should take the lead in the implementation of this educational effort. Periodic program evaluation, including

landowner surveys and commercial business enterprise inventories, would also be essential to program improvement and sustained success.

With oil and gas exploration and production considered the land use most potentially harmful to wetlands, environmental policy should continue to focus on minimizing potential oil and gas impacts in the Louisiana coastal zone. Federal (COE) and state (DNR) agencies responsible for wetland permitting should incorporate permit requirements that assure that all impacts associated with permitted activities are completely mitigated. Additional research substantiating the effectiveness of mitigation programs will be essential to adequately addressing the remediation of impacts caused by permitted activities.

Coastal parishes should consider revenue raising options that are not directly tied to surface wetland use values (land values determined by surface-related annual income). This recommendation is based on the low annual per-acre gross surface-related revenue reported by coastal landowners. Alternative revenue raising options that may be considered include increased oil and gas severance taxes, elimination of the 10-year tax exemption for new or expanded business investments, and/or elimination of the homestead exemption (the first \$75,000 of a primary homestead's value is exempt from local property taxes). With landowners expecting oil and gas exploration and production to be the most important wetland revenue source today and in the future, revenue needed for the provision of local government services may best be provided through this industry. Further research may be needed, however, to better identify alternative revenue-raising options not linked to traditional wetland uses.

Wetland policy in Louisiana should directly address concerns associated with the loss of private property rights. This recommendation is based on the strong

landowner perceptions associating wetland regulatory policy with a "takings" under the 5th Amendment of the Constitution. Policy alternatives that may address landowners' concerns about loss of private property rights include innovative incentive-based programs such as the Wetland Reserve Program (WRP) (a type of permanent conservation easement). Through a WRP contract landowners are paid market value for their land in exchange for a permanent conservation easement that assures that important wetland functions and values are provided in perpetuity. Other non-regulatory incentive-based programs include (1) tax-breaks for landowner-initiated wetland restoration initiatives, and/or (2) the initiation of a landowner conservation credit program, whereby landowners who invest in wetland conservation projects on their land are given habitat credits that can be sold or traded to other wetland permit applicants whose actions will lead to a net loss of wetland functions and values. Federal and/or state permitting agencies would have to assure that all habitat credit producing conservation projects are maintained into the future.

Wetland policy in Louisiana should continue to address concerns associated with coastal erosion. This recommendation is substantiated by the high erosion-caused wetland loss rates and the low wetland quality rating reported by many coastal landowners. This is especially true in St. Bernard Parish, where landowners reported the highest regional wetland loss, the most frequent listed coastal erosion concerns, and the lowest parish wetland quality rating. Additionally, a high proportion of the overall issues/needs listed by landowners included coastal erosion related concerns. Landowner support for coastal restoration in Louisiana seems to be high; however, a special effort must be made to protect private property rights through incentive-based government assistance programs.