A Case for Subvention of Private Landowners in the Louisiana Coastal Zone

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ABSTRACT

The Louisiana Coastal Zone (LCZ) is experiencing an unparalleled crisis of wetland loss, most of which (75%) is occurring on private lands. This paper use agricultural conservation policy as a comparative construct in a commentary that examines the rationale and methodology of providing economic incentives to subsidize wetland restoration on private lands in the LCZ.

Two Different Paths

Rapid development of two distinct trajectories for wetland conservation and restoration has occurred in Louisiana over the past decade. North of the Louisiana Coastal Zone (LCZ), the primary mechanism has been the Farm Bill. On-farm conservation programs have played a critical role in helping to reduce inland wetland losses rates by more than 75% (ERS 2001). Concurrently, Public Law 101-646, the Coastal Wetland Planning, Preservation, and Restoration Act (CWPPRA), has emerged in response to the state's tremendous crisis of coastal wetland loss. Restoration projects sponsored by CWPPRA are expected to reduce predicted future losses of wetlands in the LCZ by 22% (LaDNR 1999). The distinction between these parallel models is more than a matter of geography or efficacy, major differences also exists with respect to programmatic philosophy. These philosophical differences derive from the historic causes of wetland loss in each region, and the corresponding roles of public and private entities.

Louisiana's Inland Wetlands

As in most states, agriculture has historically been the primary cause of wetland loss in Louisiana. Of the more than 16 million acres of wetlands that covered Louisiana in 1780, approximately half (46%) have been lost, with the greatest amount of conversion occurring on forested "palustrine" wetlands (Dahl 1990). Nationwide, wetland conversions attributed to farming averaged almost 600,000 acres annually during the 1950s to 1970s, and conversions remained as a high as 280,000 acres per year

through the early 1980s (Figure 1). Yet, agriculture-related wetland losses began to be dramatically curtailed by the mid 1980s with the advent of agro-environmental policy. Of particular interest has been the evolution of conservation compliance and incentive programs first instituted in the 1985 Farm Bill. These programs expanded rapidly during the 1990s, and by 2000 conservation had become the third largest category of Farm Bill spending, second only to corn and wheat subsidy programs. The most recent Farm Bill, the Farm Security and Rural Investment Act of 2002 (FSRIA), authorizes $17 billion additional dollars for conservation, an 80% increase over the base-line conservation spending authorized in the 1996 Farm Bill (SWCS 2002). Louisiana has benefited greatly from the expansion of farm conservation policy, with more than 900,500 acres currently under contract through programs such as the Conservation Reserve Program (CRP), Environmental Quality Incentives (EQIP), and the Wildlife Habitat Incentive Program (WHIP). These programs provide direct and indirect benefits towards the conservation and stewardship of Louisiana's inland wetlands. However, the primary program for inland wetland restoration has been the Wetland Reserve Program (WRP). Louisiana leads the nation in WRP enrollment with more than 140,000 acres under contract as of 2001, an acreage level that could easily double given the expanded WRP spending authorized under FSRIA (NRCS-La 2002a). Combined with Swampbuster compliance requirements, conservation programs have made private agricultural lands the largest single source of wetland conservation and restoration in Louisiana.

Louisiana's Coastal Wetlands

Unfortunately, the mitigation of agricultural impacts has had no effect in the LCZ, where wetland losses continue largely unabated. Unlike most states, Louisiana contains a vast amount of deltaic, coastal wetlands, 32% of which have been lost over the past century. As seen inland, Louisiana's coastal wetlands have also been lost primarily because of anthropogenic factors. In the early twentieth century, a contiguous network of levees was constructed on the Mississippi River, effectively halting

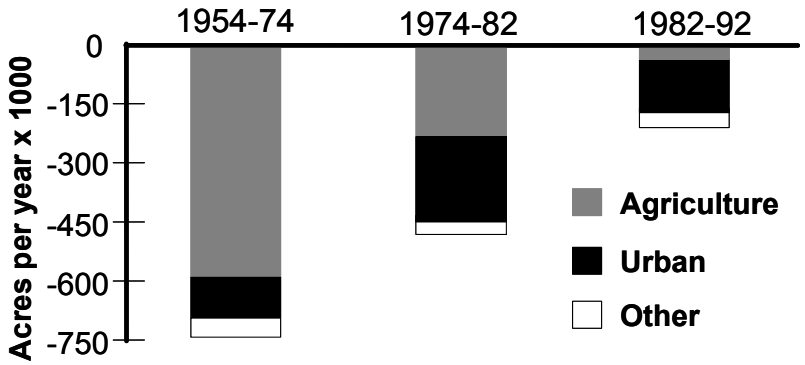

Figure 1. Sources and rates of U.S. wetland conversion, 1954-1992
(Source: Economic Research Service 2001)

deposition of the alluvial sediments and nutrients that once sustained Louisiana's coastal wetlands. Additionally, thousands of miles canals dug for navigation and commerce have greatly accelerated the rate of saltwater intrusion and erosion. Combined with natural processes such as subsidence (marsh sinking), such factors have resulted in a net loss of 1,500 square miles of coastal Louisiana over the past century (LaDNR 1999). If current loss rates continue, geologists predict that by the year 2050, an additional 600-1000 square miles of coastal Louisiana will be converted to open water (Figure 2). The economic implications of such loss would be dire for a region that is responsible for 90% of the state's economy and home to more than half the state's population (Culliton 1999).

As previously stated, CWPPRA has been the primary mechanism for addressing wetland losses in coastal Louisiana. Since 1990 the Act has authorized 107 large-scale, publicly-administered restoration projects at a cost of more that $400 million. Unfortunately, the annual CWPPRA budget of $30 - 40 million constitutes less than 10% of the funding that would be necessary to fully address Louisiana's coastal land loss crisis (LaDNR 1999). This economic shortfall suggests the need to explore alternative restoration opportunities. Given that 75% of wetland acreage in the LCZ is privately owned, the "inland model" deserves consideration.

Public or Private?

The average CWPPRA project measures 1,466 acres in size and costs $3.7 million to implement - a scale and funding level that is much larger than inland conservation contracts. By comparison, farm bill conservation initiatives implemented in Louisiana since 1990 have averaged 109 acres and cost $18,726 per contract (Table 1). The main distinction between these policies is the role played by private landowners. From a cost-efficiency standpoint, the inland model yields an apparent advantage by partnering with private entities to meet wetland resource conservation and restoration objectives.

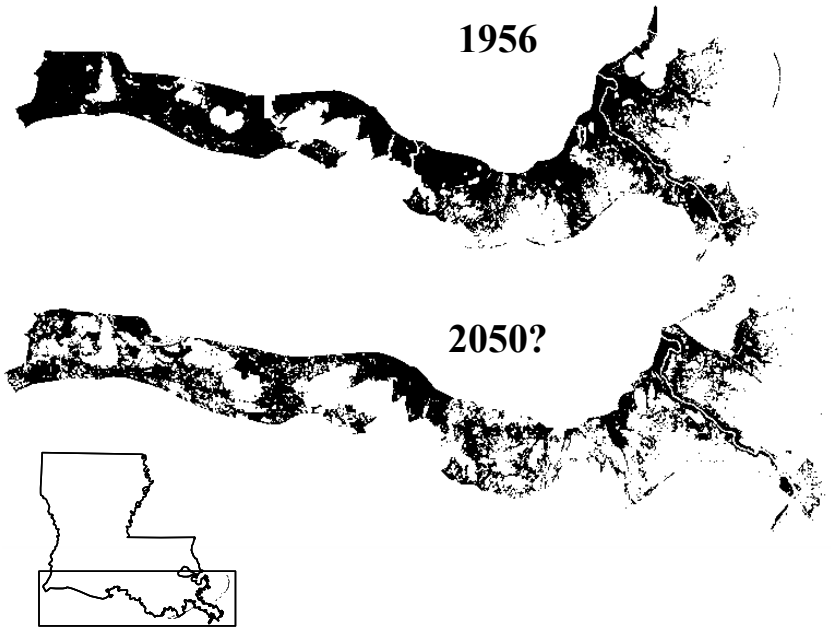

Figure 1. Louisiana's historic (1956) and projected (2050) Coastal Zone.
(Source: LaDNR 1999)

Table 1. Costs and benefits of major wetland conservation programs in Louisiana, 1990-2000. (CWPPRA 2001, NRCS-La 2001)

	Coastal CWPPRA Projects	**Inland** Farm Bill Contracts*
Total		
Number of projects/contracts:	107	8,732
Acres enrolled/benefited:	156,812	953,869
Program spending to date:	$402,000,000	$163,516,387
Average		
Acres per project/contract:	1466	109
Cost per project/contract:	$3,757,009	$18,726
Cost per acre:	$2,564	$171

** Aggregated data for CRP, WRP, EQIP, and WHIP.*

For example, implementation costs since 1990 have averaged $171/acre for inland conservation, compared to $2,564/acre for coastal. Furthermore, inland conservation programs have contracted 600% more wetland acreage in Louisiana than the acreage benefited by CWPPRA projects, and done so at 40% of the cost.

The obvious caveat of such a comparison is that of "apples and oranges", the problem of comparing the landscape-scale, public agency-sponsored coastal restoration projects to considerably smaller programs which utilize incentive payments to promote resource stewardship on private lands. Admittedly, the comparison is also suffers from the fact that the dissimilar topographies of Louisiana's coastal and inland wetlands warrant different approaches to restoration. Nevertheless, the comparison does provide a stark contrast of program philosophies regarding the respective roles of public and private entities. Furthermore, there are some indications that each model would benefit from a hybridization of technique.

The 2002 Farm Bill includes hundreds of millions of additional dollars targeting conservation issues beyond the level of individual farms, programs specifically designed to be implemented at watershed and ecosystem levels. Conversely, coastal wetland restoration policy might likewise benefit by developing some financial incentives to harness the aid of individual coastal landowners. Such incentives are necessitated not only by the environmental crisis of coastal land loss, but by an economic crisis as well.

Declining Use Values

In conjunction with ongoing processes of physical deterioration, the use-value or market-value of LCZ wetlands has also been deteriorating, due to a cascading of several negative economic factors. Colloquial references to "wetland value" in the LCZ typically delineate between sub-surface value and

surface value. The vast majority of income to coastal landowners has historically been derived from the sub-surface source, specifically, oil and gas production royalties. Conversely, coastal landowners receive comparatively little income from surface activities. Real estate values in the LCZ are considerably less than in neighboring states, where the coastal topography has allowed for heavy urbanization and industrial development. Thus, surface values in the LCZ are usually limited to a narrow range of commercial wildlife commodities (i.e. lease income from fur trapping, alligator harvesting, and waterfowl hunting). Complicating the matter, the income streams initially generated from oil and gas royalties have led to multiple heirship, resulting in a highly fractioned ownership structure in many areas of the LCZ. In recent years, much of this revenue has been declining, as mineral resources have become depleted and new exploration activities have moved offshore. Oil and gas production within the LCZ peaked in 1970, and are now on a long-term decline rate of about 4% per year (French 2002).

Combined with the tremendous problem of coastal land loss, the economic result has been a one-two punch of environmental and economic constraints: a rapidly deteriorating coastal zone divided into numerous small tracts of declining sub-surface value, and relatively little or no surface value. Finally, many coastal landowners may perceive the greatest threat to be the increasing amount of environmental regulation promulgated in recent years. One survey of more than 200 LCZ landowners found that their greatest concern was the incremental loss of property rights through environmental regulation (Coriel 1995).

Taken together, these economic factors greatly diminish the prospect for private landowners to invest in coastal wetland restoration and coastal stewardship. Indeed, many coastal landowners find it difficult simply to meet property tax obligations. Tax difficulties, in turn, are exacerbated by the property's physical deterioration. In short, as coastal marsh succumbs to coastal erosion, its use-value

decreases, primarily because of the loss of organic matter (Day and Templet 1989). In 1996, the Louisiana Tax Code instituted a usage-value tax scheme that assessed lower rates per acre at higher salinities (e.g. fresh marsh: $7, brackish marsh: $6, salt marsh: $5). Although, some relief was afforded by the tripartite tax scheme, the decrease was not substantial, and many coastal landowners continue to pay high taxes on property of very low productivity (Ryan and Susman 2003).

Non-Use Value: Agriculture as a Precedent?

Diminishing income streams, rising regulatory costs, and property tax concerns also plague inland landowners as well, but these factors are usually not exacerbated by loss of the physical landscape. Furthermore, for many agricultural landowners, these economic constraints are partially offset by public to private transfer payments. Agricultural subsidies have historically come in the form of commodity payments and commodity price supports. The payments were provided for a variety of reasons, including: income stabilization, national security, global competitiveness, and to support a "cheap food" policy. Yet, the rationale and mechanisms for providing farm subsidies has changed over the past century. Today, farm output is no longer defined solely by agricultural commodities:

> *"Meeting society's demand for improved environmental quality requires a broader definition of farm "output" to include environmental amenities such as rural landscape amenities, wildlife habitat, wetlands, and improved water and air quality..."*
> (Food and Agricultural Policy: Taking Stock for the New Century, USDA 2001).

Though public demand for environmental amenities is increasing, conservation itself is by no means new to agriculture. The first conservation concerns originated during the Dust Bowl Era of the 1930s. During those years, conservation was largely accomplished via production easements, and land retirement programs such as CRP and WRP remain a vital part of conservation policy today. The 2002 Farm Bill authorizes more than 40 million acres of contract easements for the provision of non-

market amenities such as wildlife habitat, improved water quality, and flood storage. As the Farm Bill evolves, the American public may eventually become more supportive of paying private landowners for conservation, than paying them for the production or non-production of agricultural commodities (Caffey 2002). Unfortunately, this new social contract does not yet extend into the nation's coastal zone. Yet, coastal lands provide a disproportionate amount of environmental services to the public. For example, south Louisiana is the primary wintering ground for half of the waterfowl of the Mississippi flyway, and more than 75% of those waterfowl are found with in the LCZ (Koehler 2002). The fertile marshes and waters of the LCZ also provide estuarine nursery habitat for 75% of the commercial fisheries of the northern Gulf of Mexico (Day et. al. 1989, McHugh 1980). Additionally, coastal marshes provide a buffer against the floodwaters accompanying hurricanes and tropical storms. It is estimated that for every 2.8 linear miles of marsh, storm surge amplitude is reduced by one foot (LaDNR 1999). Clearly the private lands of the LCZ provide an ecological service value that is equal to, or greater than that of inland wetlands, unfortunately coastal wetlands lack the agricultural prerequisite that affords restoration funding via the Farm Bill.

Non-Use Value: Making the Case

Natural resource management agencies in Louisiana are in dire need of a more current accounting of the non-market value of the state's coastal wetlands. The urgency behind this need derives from the attempt to justify a request for billions in federal dollars for coastal restoration. Preventing the predicted loss of an additional 600-1,000 square miles of Louisiana's coastal wetlands is expected to cost $14 billion over the next 50 years. This cost estimate was developed by extrapolating the costs of implementing and maintaining various coastal restoration technologies. But estimating benefits, especially non-market benefits, is more problematic. Three contingent valuation method (CVM) studies (i.e. Bergstrom and Stoll 1989; Costanza, et. al. 1989; Farber 1996) have been used repeatedly to extrapolate such benefits and to estimate the "cost of doing nothing", a no-action scenario that

ranges anywhere from $27 billion to $100 billion (LaDNR 1999). This wide range of economic impacts suggests the need for standardizing the assumptions and methods in which non-use, non-market values are calculated. Clearly, several parameters can significantly affect these calculations, such as discount rates and the shape of the coastal land-loss function, especially if the loss rate is assumed to be non-constant. However, standardizing discount rates and loss rates would be useless without updated estimates of market and non-market value. Ideally, such information needs to be collected for at least the three different marsh types assessed under the Louisiana Tax Code, and collected across the entire LCZ. Though CVM research methods have improved since their advent in the 1980s, CVM is still not widely accepted among economists. Nevertheless, some type of economic study is woefully needed to update non-use values associated with the LCZ, as any large scale disbursements of federal restoration funding will likely be justified largely on non-market, environmental benefits. For example, in 2000, the $7.8 billion in restoration funding approved by Congress for the Comprehensive Everglades Restoration Plan (CERP) was almost completely predicated on non-market amenities. Non-use values comprised 93% of the benefits in the cost-benefit assessment developed by the U.S. Army Corps of Engineers (Milon and Hodges 2000).

Possible Mechanisms for Subvention of Coastal Landowners

The following section provides a partial list of subvention mechanisms for private landowners in the LCZ. Some of the methods listed are conceptual, others are employed on agricultural lands, and a few are already supported in the LCZ by nominal amounts of government funding and/or guidance.

Mitigation banking – Federal guidance was established in 1992 that allowed for a partial commercialization of the mitigation sequence mandated under Section 404(a) of the Clean Water Act. Since that time, Louisiana has seen the establishment of 44 wetland mitigation banks, in which non-jurisdictional wetlands are restored by entrepreneurs, who in turn sell mitigation credits to developers

to offset the impacts of development. However, only 5 of these mitigation areas have been approved in the LCZ, primarily because of the relatively high cost of implementation and the high risks associated with long-term or perpetual maintenance in a rapidly deteriorating environment (Holcombe 2003). To reduce costs and risks and enhance sustainability, additional mitigation areas could be strategically permitted on those private lands in the LCZ that are adjacent to, or directly benefited by large-scale public restoration projects (e.g. freshwater re-introductions).

Carbon sequestration – Carbon sequestration, the storage organic carbon in terrestrial or aquatic forms, can be used to reduce or slow the atmospheric build-up of carbon dioxide, the primary greenhouse gas linked to global climate change. The highly productive fresh and brackish marshes of the LCZ contain some of the highest amounts of soil organic carbon (SOC) in the U.S., and thus may also represent the greatest potential for carbon sequestration (Markewich and Russel 2001). Green payments or carbon credits (as with wetland mitigation banking) could be allocated to private LCZ landowners to the extent that the organic fraction of their coastal property is conserved through best management practices (BMPs). However, the market mechanisms for providing carbon sequestration payments and/or credits remains largely conceptual, and federal guidance on market structure and is lacking (Feng et. al. 2001).

Long-term leasing – Most large tracts of private land remaining in the LCZ have been maintained by petroleum companies or large-scale landholder conglomerates. These entities are primarily interested in subsurface income, with surface usage typically leased for commercial and recreational wildlife harvesting. Such arrangements are often not cost-effective, because of the high maintenance and overhead costs and the short-term nature of traditional leases. Some large-scale landholders have experimented with long-term leasing via closed-bid auction. By extending the lease contract period (e.g. from 1-5 years to 15-25 years), overhead costs can be reduced, and to the extent that the lessee

agrees to incur a greater responsibility for stewardship and upkeep, maintenance costs can also be reduced. This idea is supported in theory by research on agricultural lands that shows a positive relationship between lease tenure and lessee stewardship (Malden 2000). However, because long-term leases cover a time period that is 4-5 times the length of traditional leases, tract size can quickly become a limiting factor. If lease tracts are not sufficiently subdivided, the economic scale required to participate becomes prohibitive, and the auction may fail to attract a sufficient number of bids.

De-coupled ownership – The economic constraint of maintaining property of limited surface value could be removed by the de-coupling of sub-surface and surface ownership. Indeed, some LCZ landowners might be willing to sell or even forego their surface rights in exchange for reduced tax and regulatory liability. Decoupling sub-surface rights would allow for surface rights to be sold or donated to non-governmental organizations (NGOs) such as land-trusts or to government sponsored restoration programs such as CWPPRA.

Tax incentives - Despite the economic constraints of property ownership, most landowners of the LCZ reportedly would prefer tax-incentives over outright government purchase (Coreil 1995). In many states where wetlands comprise a small percentage of the surface land area, property delineated as wetlands have been deemed tax exempt. Ryan and Susman (2003) suggest that such an exemption may be a viable option in coastal Louisiana, if the potentially debilitating effects to local revenue could be offset by severance, processing, and mineral taxes. The authors report that the current, tripartite scheme of marshland taxation should be refined to include a more landowner-specific approach to tax assessment. At a minimum, the LTC should develop a more detailed use-assessment scheme to ensure that property taxes are assessed according to activity and not by extent standards.

Species Eradication - The LCZ is plagued with several species of invasive plants and animals that cause millions of dollars in economic damage annually. One good example of private landowner assistance for invasive species control is the recently enacted Comprehensive Nutria Control Program (CNCP), in which CWPPRA has set aside 2.2 million annually for 10 years to subsidize the trapping of nutria (*Myocastor coypus*). The $4 per nutria bounty provided through the CNCP is expected to significantly reduce nutria populations while helping to sustain economic activity on private coastal lands. Although the CNCP provides a model for exotic species control on private lands, nutria have been in Louisiana for almost a century, and it is estimated that upwards of 100,000 acres of coastal marsh are impacted by nutria at any one time (NRCS-La 2002b). Clearly, the time of response between identifying to controlling an invasive species is critical. For example, the floating fern Common Salvinia (*Salvinia minimia*), was introduced to Louisiana over 20 years ago and has gradually expanded across the LCZ, displacing native vegetation and wildlife and significantly hindering water quality and waterway access. Giant Salvinia (*Salvinia molesta*) has been in the LCZ for less than 10 years and is spreading even more rapidly. As was initially the case with nutria, eradication of Salvinia is being addressed by eradication programs (mechanical, chemical, and biological control) administered only at the state and local level. Although Salvinia primarily affects private coastal lands, no program dollars have been made directly available to private landowners. Other invasive plant species of concern in the LCZ include Hydrilla (*Hydrilla verticillata*), Water Hyacinth (*Eichhornia crassipes*) and Chinese Tallow (*Tridica sebifera*).

Species Protection - Of the 26 Threatened and Endangered Species (TES) of plants and animals listed in Louisiana, approximately 20 are found in the LCZ (USFWS 2003). Compensating private landowners for the protection of TES is not a novel concept, and various compensation mechanisms have been suggested for TES species such as red wolves and red-cockaded woodpeckers (Smathers et. al. 1994). There is one program currently in place that could provide LCZ landowners with such

incentives. The U.S. Fish and Wildlife Service awards $10 million annually through a Private Stewardship Grants Program (PSGP) to encourage landowners and their partners to protect and restore imperiled species and their habitats.

Conservation Agreements - In the 1970s and 1980s, many landowners in the LCZ participated in the Water Bank program (PL-91-182) that provided $30 million annually to fund payments for wetland preservation via 10-year contract easements. However, the water Bank was subsumed in the budgetary expansion of CRP. Currently, there are 20 projects pending authorization under a new initiative called the Coastal Wetlands Reserve Program (CWRP). Additionally, Landowners in the LCZ interested in waterfowl habitat improvement projects may be eligible for funding under the North American Wetlands Conservation Act (NAWCA). The NAWCA was established in 1989, primarily to support the North American Waterfowl Management Plan by providing small grants and cost-share partnerships for wetlands conservation projects. The total estimated funding for NAWCA in 2002 is approximately $80 million. Finally, the National Oceanic and Atmospheric Administration (NOAA) recently developed a Coastal and Estuarine Land Conservation Program (CELCP) that provides approximately $15 million annually for the protection of coastal estuarine lands that are important for their ecological, conservation, recreational, historical or aesthetic value.

Restoration cost-share - Perhaps the most promising subvention mechanism needed by landowners in the LCZ is some type of direct cost-share assistance for privately-conducted restoration using native vegetation. The USDA/NRCS operates a Plant Materials Center (PMC) in the LCZ that develops improved strains of native coastal vegetation for use in federally-funded restoration programs. To date most of this effort has been targeted at the selection and improvement of cultivars of Smooth Cordgrass (*Spartina alterniflora*), a dominate plant of Louisiana's brackish and salt marshes. More recently, the PMC has expanded its experimental selection efforts into additional grasses such as:

Seashore Paspalum (*Paspalum vaginatum*) and Bitter Panicum (*Panicum amarum*); and woody species such as Black Mangrove (*Avicennia germinans*) and Southern Wax Myrtle (*Myrica cerifera*).

Several landowners in the LCZ have begun use native vegetation on their own to protect those areas of their property that are at high risk to erosion. However, planting the vegetation is an expensive and labor intensive process. Some form of restoration cost-share is needed to defray these costs and encourage more LCZ landowners to re-vegetate critically eroding areas of their property. The PMC currently releases parent materials to nurseries specializing in coastal wetland plant production. These nurseries propagate the approved plants commercially and then sell the resulting plants to CWPPRA and other federal entities for use in coastal restoration projects. The establishment of cost-share mechanisms in support of coastal re-vegetation on private lands would bolster this fledgling industry and greatly help to expand re-vegetation efforts in the LCZ.

Summary

Over the past decade wetland restoration in Louisiana has diverged into two primary pathways: the inland approach, via the Farm Bill; and the coastal approach, via CWPPRA. The two programs are delineated by more than mere geography (inland/coastal), they also differ dramatically in the way respective conservation and restoration projects are implemented. A comparison of these two models provides a stark contrast regarding the respective roles of the private and public sector. The inland, model confers an apparent advantage over the coastal model by engaging the self-interests of private landowners in order to minimize costs and maximize the acreage benefited by restoration spending. Since 1990, inland conservation programs such as WRP, CRP, WHIP, and EQIP have contracted 600% more acreage in Louisiana than the acreage benefited by CWPPRA projects, and done so at 40% of the cost. Admittedly, such an analysis suffers from a lack of standardization, comparing large-scale agency sponsored coastal restoration projects to considerably smaller projects that utilize incentive

payments to promote resource stewardship on private lands. However, the comparison is intended as neither indictment nor endorsement of either model, rather, the intent is to illustrate the need for a hybridization of technique.

Owner-initiated restoration is severely limited on private LCZ lands because of the economic reality of diminishing surface and sub-surface income, increasing regulatory constraints, and an extant tax structure that fails to adequately delineate the use value of coastal property. These economic constraints are further exacerbated by the reductions in surface productivity as coastal property succumbs to erosion. Concurrent with this situation is the ongoing depletion of non-use values derived from ecological services, such as waterfowl over-wintering, estuarine fisheries habitat, and storm surge buffering. While the provision of such services on private lands is increasingly subsidized via farm policy, such policy does not typically extend into the coastal zone. Private lands of the LCZ lack the agricultural prerequisite that affords protection via the Farm Bill.

Site-specific policy instruments are needed that will stimulate maintenance and restoration activities on privately held wetland properties in the LCZ. A number of market-based mechanisms warrant consideration, including: mitigation banking, carbon sequestration, creative leasing arrangements, de-coupled property transfer, and tax incentives. However, given the significant ecological value of coastal wetlands, it is logical that some type of public to private subvention mechanisms would also be justified, including financial support for species eradication or species protection, conservation easements and restoration cost-share agreements.

Coastal Louisiana has lost 1500 square miles of wetlands over the past century and it is predicted that an additional 600-1000 square miles will be lost by the year 2050. Though 75% of this loss will occur on private lands, little or no direct restoration funding is available to private interests. At its current

level of funding, CWPPRA is providing less than one tenth of the dollars necessary to adequately address Louisiana's coastal land loss crisis. Given, this budgetary constraint, it is logical to seek out more cost-effective alternatives for coastal restoration. To fully address Louisiana's tremendous crisis of coastal land loss, state and federal decision-makers need concise assessments of the full range of conservation and restoration options, including public to private transfer payments. In short, coastal landowners represent a largely untapped resource for carrying out small-scale, cost-effective wetland restoration and stewardship.

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