Alignment of Land Conservation Spending with State Wildlife Action Plans

NATIONAL COUNCIL FOR SCIENCE AND THE ENVIRONMENT

WILDLIFE HABITAT POLICY RESEARCH PROJECT 2B

Synthesis Report

DEFENDERS OF WILDLIFE
THE TRUST FOR PUBLIC LAND

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Abstract

This report summarizes the findings of a research project funded by the National Council for Science and the Environment, under the auspices of the Wildlife Habitat Policy Research Program (WHPRP), to investigate the amount of land area protected and land conservation expenditures aimed at the implementation of the State Wildlife Action Plans (SWAPs). The specific purpose of this WHPRP project was two-fold: (1) to determine the extent to which spending on land conservation has aligned with the priorities in the SWAPs for five case study states (Oregon, Montana, Missouri, Florida, and Massachusetts); and, (2) to synthesize the major findings from the case study states to assist other state SWAP coordinators in developing their land conservation system. This report constitutes the Synthesis Report. The period for which we investigate the alignment of acreage and expenditures is 1998-2007. In addition to analyzing conservation expenditures and land area protected, we also identify the future costs of conserving unprotected SWAP conservation priority areas and provide policy recommendations for how conservation expenditures at the federal, state, local government, and private sector levels could be better aligned with SWAP priorities. Our major findings are summarized here.

First, there is no state that has a coordinated system of data collection and analysis related to expenditures and acreage protected for all levels (federal, state, local government, and private) of land conservation effort. Indeed, there are some public and private entities that do not collect, share or spatially depict acreage or expenditure data due either to the lack of resources or concerns over privacy. Thus, a first priority is to fill in the data gaps and address confidentiality issues in order that a more accurate picture of land conservation can be drawn. In the meantime, the data upon which this study has been conducted can serve as a baseline to measure future conservation effort. For the expenditure data that we could spatially represent, we found from the five case study examples that the amount of overlap with the SWAP priority areas ranged from 34% to 89% for the 1998-2007 time period. The percentage of overlap will certainly be higher when data gaps are filled, especially at the federal and private sector levels.

Second, based on the results of our five state case studies, there is a wide variety of approaches to land conservation amongst the states. We believe that the diversified land conservation approaches and funding mechanisms that we found are strengths of our analysis in that they will provide other states with different examples of resources and tools to promote implementation of the SWAPs. For example, while some of our sample states focused on permanent conservation easements, others emphasized fee-simple purchases. Some states had high levels of federal expenditures for land conservation, while others focused on leveraging local or private sector dollars. States are increasingly becoming more strategic in their land acquisition and protection efforts, but there is still a need for a comprehensive accounting of expenditures and acreages in order to guide future land conservation activity.

Third, the future average costs of protecting SWAP areas not yet conserved over the next 30 years in our sample states ranged from about $14 to $250 billion for fee-simple purchases, levels which are competitive with many other types of social or infrastructure investments. Protecting land through the use of easements or by paying land owners to manage for habitat or biodiversity values are much less expensive. State-wide average cost estimates are important for determining general levels of funding that will be required to implement the SWAPs and develop policies and programs to meet those costs. However, we highly recommend that estimates for individual land protection projects be locally driven, and we recognize that for the easement option transactions costs can be significant.

Lastly, in order to put our findings into a context that will be useful for other states, we provide a framework for understanding an individual state's "conservation system." Components of this system include accounting for all state funding sources and ways that those sources can be directed towards SWAP implementation, land selection strategies, land protection approaches, interaction with non-state funding sources, and management of land conservation information. In combination with developing the capacity to link spending and spatial information in a geographical context, we believe the proposed framework will result in a more efficient and strategic use of funding to implement the State Wildlife Action Plans.

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I. Introduction and Purpose

Each state has invested in creating a State Wildlife Action Plan (SWAP) that sets out a strategy to prevent wildlife in each state from becoming endangered. Many of the SWAPs identify the most important wildlife habitat in the state and strategic habitat areas that require protection. That protection results from spending by both government agencies and private entities that together spend billions of dollars in the U.S. each year to conserve land. For conservation practitioners and policy makers to build a case for increased – or even sustained – expenditures for habitat conservation, they require knowledge of how current funds are being used. Unfortunately, there is no single accounting source that demonstrates the extent to which these expenditures are being employed to protect identified strategic habitat areas.

Information on how well-aligned spending on land conservation is with the priorities in the SWAPs could be useful to both land protection programs and funding entities. Many sources of funding are used to protect land in a state, including federal, state, and local government sources and private funds from non-governmental organizations (NGOs), such as land trusts. The more land protection programs know about all the sources of funding that are used in their state, the better suited they are to put together strategies to influence where those funds are spent or to pursue sources that might not have been tapped fully in the past.

To get a good picture of land protection, one needs to understand both the sources of funding for land protection and also which lands are protected by specific funding source. Spatial analysis using GIS can provide a valuable perspective by depicting the location of protected parcels. More valuable, though, is the ability of spatial analysis to compare the protected parcels to other features, such as land cover types or the strategic habitat areas defined in the SWAPs. This type of analysis can show the extent to which the land being protected by type of funding aligns with SWAP strategic priorities. Land protection programs could use this information to let the public know how well their state is progressing with plans to protect strategic habitat areas. Information about the type of land that has been protected using various funding sources also would enable funding entities to demonstrate to taxpayers or private benefactors what is being accomplished with their money.

Another component of land conservation, in addition to spending and spatial information, is the way in which states use policies and programs to direct funding towards activities that will achieve their conservation goals. Key aspects of a state's policy environment include the types of funding the state can use for land protection and how stable the funding is, how state programs select land for protection, what land protection approaches the state favors such as fee simple purchase or acquisition of easements, how the state interacts with non-state funding sources, and how the state manages information about land conservation. Each state has its own approach to land conservation policy, which can have an impact on the state's ability to align conservation expenditures with protection of strategic habitat areas identified in the SWAP.

An additional factor that is critical for understanding future land conservation efforts is the cost of land protection. As states identify strategic habitat areas for protection, they must consider the potential costs to protect them. The two approaches that we investigate in our analysis of expenditures are based on permanent land protection – purchase of a property in a fee simple transaction or acquisition of a conservation easement. Each approach has different costs. Features of the land, such as the land cover type and its location, particularly where development pressure is high, have significant impact on land protection costs. Developing approaches to estimate future protection costs could serve states well as they establish priorities for protection in light of possible funding levels from all sources, and also as they consider mechanisms to increase access to additional sources of funding. In our cost estimation section for conserving as yet un-protected priority areas we not only consider the costs of fee-simple acquisition and easements, but also land rental and paying private landowners to manage for wildlife habitat values.

The purpose of this Wildlife Habitat Policy Research Project was two-fold: (1) to determine the extent to which spending on land conservation has aligned with the priorities in the SWAPs for five case study states (Oregon, Montana, Missouri, Florida, and Massachusetts), and (2) to synthesize the major findings from the case study states to assist other state SWAP coordinators in developing their land conservation system. The project had two goals. The first was to characterize the land conservation system in the five states[1] and evaluate how well land conservation expenditures are accomplishing habitat conservation objectives in each. The land conservation system is made up of expenditures (represented by spending data from each funding agency), land areas protected (represented by spatial data), the policy environment, and costs of land protection. The second goal was to provide a framework to help other states understand their own land conservation systems and to offer ideas about ways states might achieve better alignment between land conservation investments and strategic habitat areas.

[1] The states in this study were selected based on the existence of mapped strategic habitat areas, anticipated availability of data, development pressure (two of our states overlap with those analyzed in WHPRP 2C Project, Time Sensitivity of Priority Habitats), and the prioritization of biodiversity protection in the states' open-space programs. They include Oregon, Montana, Florida, Missouri, and Massachusetts.

II. Summary of Results

We undertook this study to gather and analyze data about land that was protected in a sample of states to determine how much of the protected land fell within strategic habitat areas identified in the SWAPs. The results of the detailed analysis of each state are reported in five individual State Reports that are posted on the websites of the National Council for Science and the Environment, Defenders of Wildlife, and the Trust for Public Land. Rather than being able to focus on measuring overlap with SWAP priority areas, we were challenged to assemble a baseline of spending, acreage, and spatial data for land protection projects. State agencies manage their own program data, but they are not tracking the whole range of land protection programs in their states beyond state programs – which means that they do not maintain data on programs of federal and local governments and private organizations (i.e., land trusts and other NGOs). Although use of Geographical Information Systems (GIS) is widespread, there is little coordination of what data is collected about each land transaction. There also is not much consistency in terms of how the data is validated and shared. Although we did get access to a lot of spending and spatial data related to land protection in each state, it was difficult to structure a data set that we could use to assess progress towards the land protection goals established in each state's SWAP.

We believe that there is great value in establishing a geospatial baseline and tracking *all* land protection activities in order to assess progress in protecting strategic habitat areas. It is important for states to understand the range of land protection programs since many of the non-state programs spend much more on land protection than states do. Land protection programs that use funding from sources other than the state could provide additional resources to protect land within the strategic habitat areas if state agencies can find ways to guide investment by these non-state programs.

In the following sections, we summarize the results of each segment of the study – the expenditure and acreage analysis, spatial analysis, policy analysis, and cost analysis. We highlight how each of these aspects plays a role in the degree to which land protection expenditures align with the strategic habitat areas defined in the SWAPs. We then provide proposals about potential financing mechanisms that might be tried by states to make more money available to land protection efforts. We end with a suggested framework that all states could use to evaluate their own land conservation system and identify possible changes that might yield greater alignment between land protection investments and protection of strategic habitat areas.

A. Analysis of Land Conservation Expenditures and Acreage Acquired

Our discussion of land conservation activity, including dollars spent and acres protected in Florida, Massachusetts, Montana, Missouri, and Oregon (collectively called the study sample), is composed of two interrelated topics. First, we provide estimates of the total amounts spent and acreage protected by various public and private land conservation entities for the period 1998 through 2007.

Second, we provide, where data was available, a spatial analysis that illustrates the amount of overlap between land conservation expenditures and acres and the location of strategic habitat areas identified in the various SWAPs. Most of the SWAPs were adopted in 2005, so any overlap between conserved lands from 1998 through 2007 might not be related to the existence of the SWAP. However, many states had processes in place to identify high priority habitat before the SWAPs were written, and conservationists may have selected land for protection based on earlier versions of the analysis used in the SWAPs. Our current alignment analysis with the strategic habitat areas really serves more as a baseline of which locations within the strategic habitat areas have been protected, rather than as an indicator of whether land conservation funding has been used strategically for the purpose of implementing the SWAPs.

Organization of Funding Programs

We gathered data on land conservation funding programs, including federal, state, and local government programs and those of private organizations, such as land trusts and other NGOs. We refer to this as analysis by level of government. We divided federal spending programs into three categories that represent different types of interaction between the federal government and the states, based on how the funds are distributed and used. We differentiate among the federal programs in terms of the amount of control a state could have over where the funding is directed and to offer some insight into ways a specific state might influence what land is protected by federal land conservation funds. The three categories are (1) federal programs that acquire land for federal land management agencies; (2) federal programs that provide funds that are coordinated by state agencies for use in the state; and (3) federal programs that provide competitive grants to conservation partners within a state, but funds are not coordinated by a state agency. Appendix B includes a list of the federal funding programs in each category.

The state has the greatest influence over land selection for federal funds that are provided to a state agency, such as the Forest Legacy Program (FLP). States probably have the least influence over funds used by federal land management agencies to expand their own landholdings in the state, such as National Parks. The third category includes funds that go to entities in a state, but do not go through a state agency to be disbursed, such as North American Wetland Conservation Act Grants (NAWCA) and United States Department of Agriculture's Natural Resource Conservation Service (NRCS) resource conservation programs. Some programs offer competitive grants to NGOs, local governments, tribal governments, and private landholders, and some also allow state agencies to compete for funding. The state can influence land selection of recipients of these funds if it works with the public and private entities early in the process.

We faced many challenges gathering expenditure and acreage data from various programs, organizations and agencies. We summarize the challenges in Table 2.1 and discuss them more fully in Section III.

Table 2.1: Summary of Data Collection Challenges

Data Challenge	Problem	Level of Government	Result
Missing Data	No dollars	Private	Only acres counted if provided
	No GIS shapefile	Federal, Private	Data included in spending analysis, but not spatial
Precision of Data	No correlation between expenditure and spatial data, only point or "blob" data provided	All	We could not use some data in analysis, could not link some spending to spatial record
Access to Data	Privacy issues, cost to access data	All	Received only acreage data or did not collect data
Double Counting	Same acres and dollars were included in multiple data sets	All	Prevented this by using spatial data and requesting data providers to list all partners in a project

Despite the challenges, we have a high level of confidence in the quality of the data we were able to collect and analyze.

Conservation Expenditures[2]

During the 1998-2007 time period the study sample spent a median of $364 million on land conservation across the five case study states (See Appendix C for a state-by-state breakdown conservation expenditures and acreage for 1998-2007). The composition of programs, geography

[2] Information regarding whether or not an acquisition was acquired through a bargain sale was not always provided in the data received from providers. If the information was provided we included it in the "comments" attribute of the spatial database. All bargain sales are included in the expenditure totals provided in this section. In the spatial analysis, donations were included. Because no funds were used in such transactions those data were only included in the acreage overlap analysis and not the spending analysis.

and trends in each state varied widely, producing vast differences in conservation activity. Florida, which had the oldest and most well funded state program, spent the most on land conservation, $3.4 billion, while Missouri spent $200 million during the same time period.

The federal government spent the most in Oregon, Montana, and Florida, which is not altogether surprising considering Oregon and Montana are western states that have historically had more federal lands and land acquisition activity. Most of the federal money in Florida was spent on the Everglades during this time period. The median federal spending was $157 million per state. For 1998-2007, the federal government spent the most in Florida, $302 million, followed by Montana at $217 million.

For state government expenditures, Florida was the leader in conservation spending at $2.7 billion from 1998 to 2007. Massachusetts follows at $384 million. Both states have traditionally had substantial investment through dedicated revenue streams for land conservation. Florida's investment through the Preservation 2000 Program and the Florida Forever Program is unparalleled. The main source of funding comes from the documentary stamp tax, which collects revenue through real estate transactions. Revenue from the documentary stamp tax is split among general revenue, state and local housing trust funds, land acquisition trust funds and water management trust funds. Land acquisition receives approximately fifteen percent while water management receives approximately six percent of funding. In July 2008, the Florida Forever program was extended through 2020 at $300 million a year, the same amount as in previous years. However, for the first time in seventeen years, the Florida legislature in 2009 failed to provide funding for state land conservation programs. The recession and decline in real estate activity led to a precipitous decrease in state documentary (real estate transfer) tax revenues of almost 70 percent. Despite strong support from the Florida Senate and the Governor, in final budget negotiations House leadership rejected all funding for Florida Forever.

The Massachusetts Legislature authorized bond expenditures for environmental programs beginning in 2002 for $753 million, of which $220 was for land acquisition. In addition, the state provides incentives for local land acquisition through the Community Preservation Act (CPA). Most recently, Massachusetts passed a new $1.64 billion environmental bond. Over five years $250 million of this bond will be dedicated for land conservation.

While Oregon and Missouri have also committed state investment through dedicated revenue streams, they generate much lower levels of funding. Oregon generates an estimated $46.2 million annually through lottery proceeds and Missouri's 1/8 of one cent sales tax creates approximately $90-100 million per year, not all of which goes towards land acquisition.

Local government land conservation expenditures also varied by state. The median for local government spending across the study sample from 1998 to 2007 was $136 million. Again, Florida and Massachusetts were the leaders as each state has created local incentives through state matching programs, which allow for more leverage capacity. Oregon and Missouri's local governments spent more on land conservation during the 1998-2007 time period than the state governments did. Due

to time constraints, we could only gather data on four[3] of the 22 counties that have passed land conservation finance measures in Florida. Even so, local funding from the four Florida counties totaled $354 million, which is more than total state-wide local government expenditures in other states.

For the private sector (e.g. land trusts), there is considerable variation in land conservation among the states. The median for private spending across the five states was $25 million; $185 million was spent in Massachusetts while only $4.4 million was spent in Florida. Florida's private funding may be undercounted because we only tracked spending by private entities in the five counties we selected for local government spending.

Table 2.2 provides data on land conservation expenditures by level of government in each state. Appendix C contains a more detailed breakdown of expenditures and acres protected by program type.

Table 2.2: Land Conservation Expenditures, 1998-2007

	Oregon	**Montana**	**Florida**	**Missouri**	**Massachusetts**
Program Type	($ million)				
Federal Funding	$157.5	$216.9	$301.7	$118.8	$68.2
State Funding	$40.6	$45.8	$2,701.2	$26.1	$384.8
Local Governments	$135.6	$15.3	$354.9[1]	$27.8	$274.6
Private Programs	$24.9	$86.0	$4.4	$25.4	$185.4
Total Spending in State	$358.6	$363.9	$3,362.2	$198.3	$913.0

[1] Only includes spending data from five selected counties in Florida.

Figure 2.1 provides a graphic representation of land conservation expenditures, excluding federal spending data, to illustrate the varying amounts of funding generated within each state – by state and local governments and private organizations that generally are funded by donations.

[3] One Florida county that we selected, Putnam County, was chosen for its geographic and land cover diversity. Putnam County has never had a conservation measure.

Figure 2.1: Non-Federal Expenditures for Land Conservation, 1998-2007

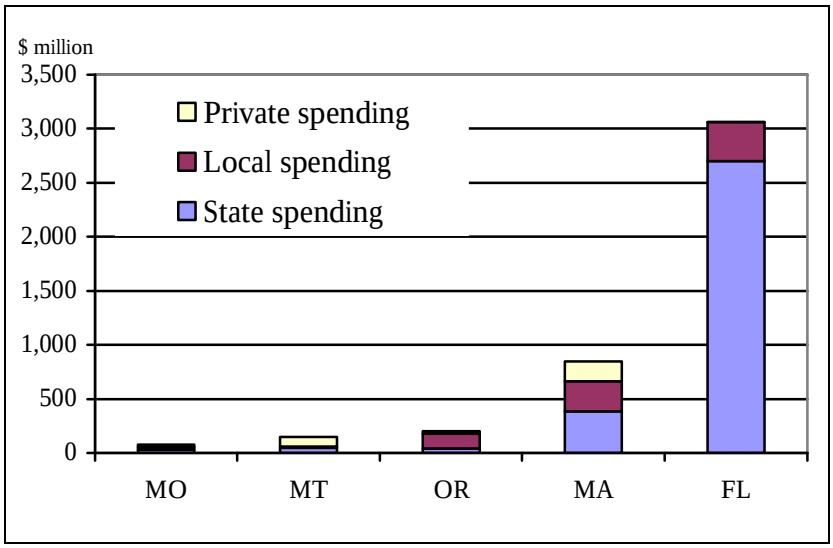
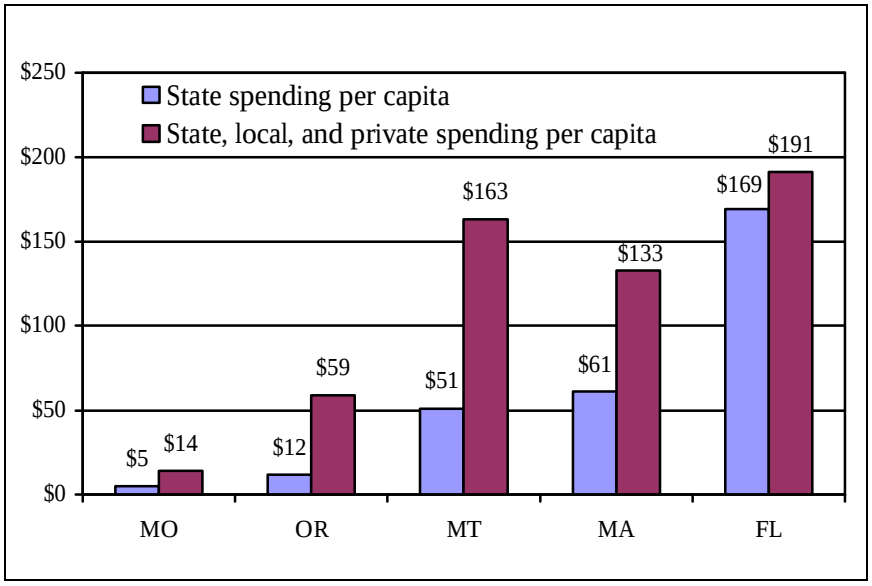


Figure 2.1 illustrates the great differences in total non-federal expenditures among the case study states, while also showing the significance of local government funding programs among the three states with the greatest expenditures: Oregon, Massachusetts, and Florida.

Another way to analyze the expenditure data is by comparing spending per capita. Figure 2.2 compares spending on a per capita basis for state and local government and private entities.

Figure 2.2: Land Conservation Spending per capita, 1998-2007



The non-federal sources represent investment by the citizens of the state through their state government, local governments, and donations to private organizations.

The two states with the largest populations (Florida and Massachusetts) also have the highest per capita land conservation expenditures. This might be explained by a combination of scarce land resources and rising prices, and/or a large population base to tax or to provide donations. Another factor may be the desire of the state population not to lose more, and increasingly rare, open space.

When population is taken into account, differences in spending by state are not as significant as were differences in total spending (see Figure 2.1). There appear to be two categories of spending, two lower spending states – Missouri and Oregon – and three higher spending states – Montana, Massachusetts and Florida.

Acreage Protected

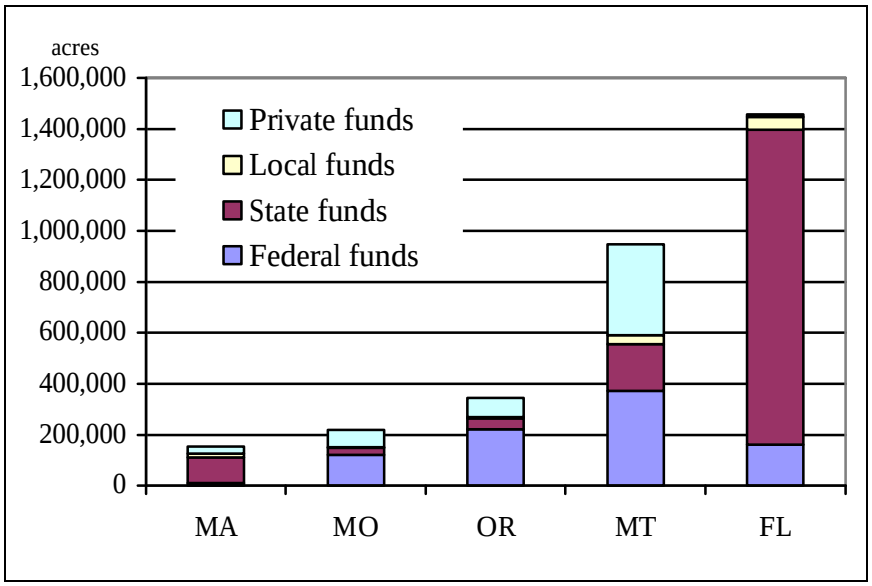
Between 1998 and 2007, the median for total acres protected across the study sample was 345,000 acres. Table 2.3 (see also Appendix C) provides a break out of acreage acquired by state and by level of government. Florida acquired the most land during this time (1.4 million acres), followed by Montana (947,000 acres).

Table 2.3: Acreage Protected, 1998-2007

	Oregon	Montana	Florida	Missouri	Massachusetts
Program Type	(acres)				
Federal government	222,548	371,707	161,500	122,696	10,638
State government	41,178	184,136	1,235,532	27,430	99,826
Local government	7,101	33,212	50,838	2,176	16,007
Private entities	73,965	358,079	7,782	68,127	27,191
Total Acres Protected	344,791	947,144	1,455,652	220,429	153,662

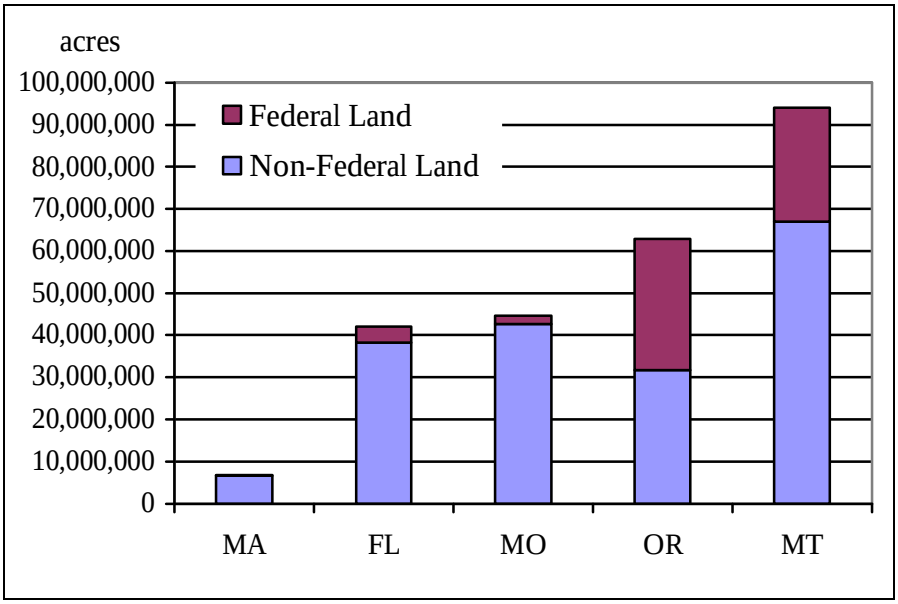
As with expenditures, there is a wide range in the study sample with respect to how much land was protected from 1998 to 2007. One major reason for the differences in acreage protected between the states is the cost of land per acre. Land costs are discussed in detail below in "Cost Analysis." The cost per acre varies greatly depending on factors such as location, land cover type, and how active the real estate market is. The difference in the cost of land is most apparent with the Massachusetts data. Although Massachusetts spent more than the majority of the study sample (refer back to Figures 2.1 and 2.2), it acquired the fewest acres. The acreage protected by funding source is shown in Figure 2.3.

Figure 2.3: Acres Protected by all Funding Sources, 1998-2007



The acreage protected using federal funds varies widely, as can be seen in Figures 2.3 and 2.4. States that have more federally-owned land are more likely to see additional purchases by federal agencies to acquire in-holdings and to acquire adjacent properties to buffer the land already protected. Figure 2.4 shows the percent of land owned by a federal agency in a state compared to either state- or privately-owned land.

Figure 2.4: Federal and Non-Federal Acreage in Five States



Montana and Oregon have the most federally-owned land among the states in the sample at twenty-nine percent and fifty percent, respectively, and these states also had the greatest amount of federal spending between 1998 and 2007.

States can develop a fuller understanding of the relative importance of different funding sources by collecting and analyzing data on funding programs active in a state, including the dollars spent annually and the acreage protected. Data collection of this type also allows states to determine if there are land conservation programs offered nationally, by the federal government or NGOs that the state might be able to benefit from to a greater extent. This data also provides information about land protection in different areas of the state by local governments and land trusts, which could point to areas that may need state attention to attract funding to protect strategic habitat areas.

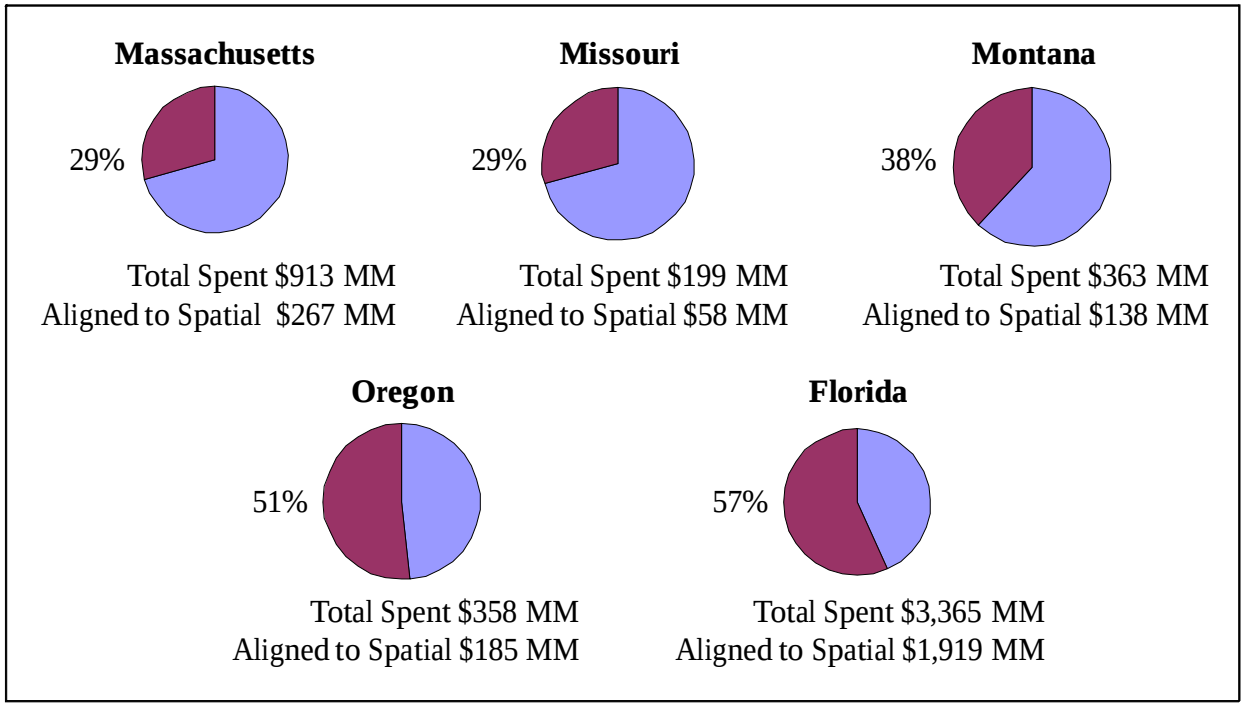
B. Analysis of Overlap of Land Conservation Activity with Strategic Habitat Areas

A key component of this study was to assess the amount of overlap of land conserved during the study period with strategic habitat areas defined in the SWAP. To do this, we needed spending and acreage data on each acquisition project to be tied to parcel spatial information. We found that sufficient data on land protection projects was available for only a portion of the projects included in the study. Thus, our data on conservation expenditures and acres protected are underestimates of actual land conservation activity for 1998-2007. Difficulties with data collection and analysis are discussed in Section III.

Availability of Spatial Data

Our ability to align the many thousands of transaction records we received from all data providers to individual spatial records varied widely among states and among levels of government. Figure 2.5 shows the percent of spending data that we were able to associate with spatial information for each of the states.

Figure 2.5: Percent of Total Spending Aligned with Spatial Data



In Massachusetts only 29 percent of the total dollars spent could be aligned to a spatial record. Despite the existence of a robust program in Massachusetts to assemble all the spatial data of areas protected into a single open space data layer, the spatial data did not include attributes that we could use to link spatial records to transaction records.

Another factor contributing to the low alignment percentage in Massachusetts is that the Community Preservation Act (CPA), a very large spending program by local governments, only used point spatial data to identify parcel locations. These points typically were generalized to the town center of the township in which the transaction took place, rather than representing the actual parcel location. For this reason, very few CPA acquisitions could be used in the overlap analysis. The data from private conservation organizations that we received was typically very good and we were able to analyze alignment quite often.

In Missouri, we also were only able to align 29 percent of the total spending to spatial records. This gap in alignment was mainly due to the large amount of spending by the USDA Natural Resource Conservation Service (NRCS) programs. Unfortunately, these programs (Wetlands Reserve, Farm and Ranch Lands Protection, and Grassland Reserve Programs) could not provide spatial data for any of the states in this analysis. The federal programs generally did not provide spatial data because it rarely existed or if it did, the agency was not permitted to make it available to us. The spatial data that existed at the level of state government funding in Missouri was typically of larger park or refuge boundaries, rather than individual parcels that made up larger boundaries. To address this issue, we created generalized spatial boundaries of appropriate acreage to reflect the amount spent or not spent on a wildlife priority area. This could only be done if the larger generalized boundary was

either entirely inside or entirely outside the wildlife priority areas. If part of the parcel overlapped with a wildlife priority area and part was outside it, we could not link spending with spatial data. As a result, the percentage of records that could be aligned to spatial data was low.

In Montana, 38 percent of the total dollars spent were aligned to spatial data. This low level of alignment was due largely to the amount of money spent by federal programs for which no spatial data was available. Montana has a single statewide database of easements that was anticipated to provide a great deal of the spatial data that we would need. Unfortunately, the Montana dataset did not have any unique identifier information or other attributes that would allow for an alignment with the transaction information provided to us by various land trusts. The lack of an identifier in the state dataset made it difficult to align transaction records with a specific physical location. We were able to align acreage and expenditure data for local government and state agency spending programs most of the time.

In Oregon, 51 percent of the total dollars spent was aligned to spatial data. This comparatively higher percentage was mostly due to the high quality data provided through the Portland Metro program (Washington, Multnomah and Clackamas Counties) and the existence of a unique identifier that streamlined alignment of the Oregon Department of Natural Resources transactions. Data from private funding programs were generally difficult to align in Oregon. The lack of spatial data for the Bonneville Power Administration program left a major data gap.

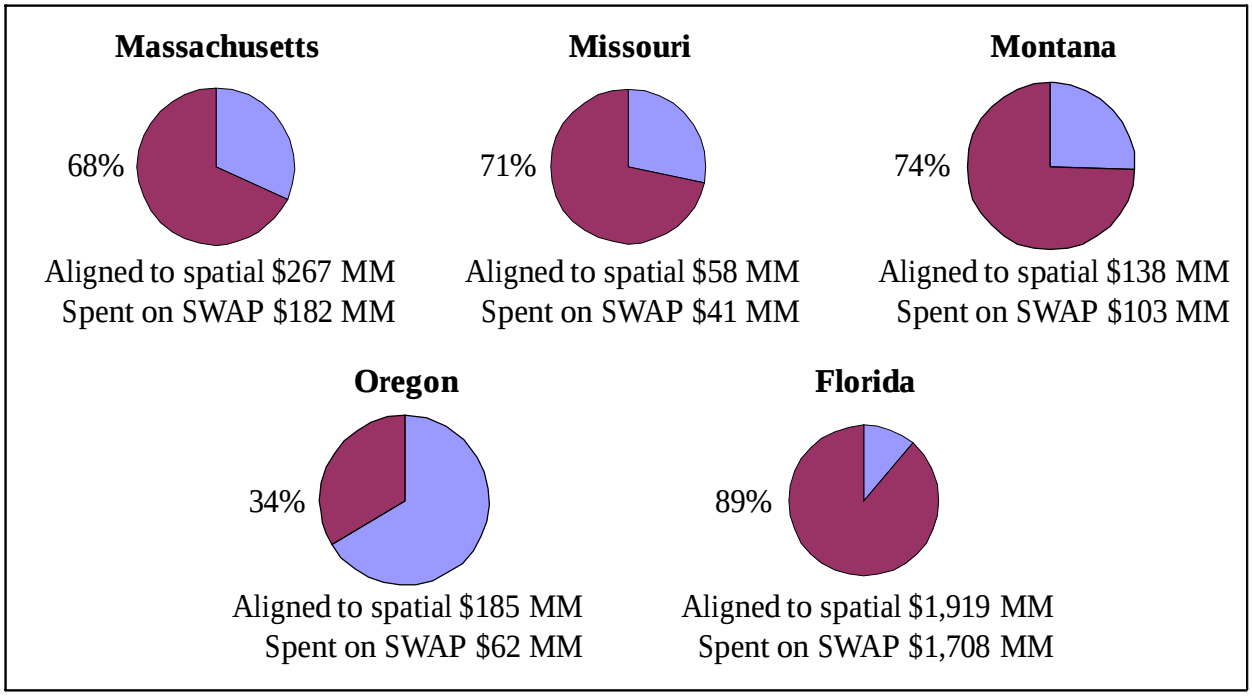
In Florida, 57 percent of the total dollars spent was aligned to spatial data. This was the highest percentage of the five states in this study, mostly due to the work of the Florida Natural Areas Inventory (FNAI) program, which aligned the Florida Forever Program spatial data to transaction data for this project. FNAI provided more than 6,000 land conservation records for this study. Because most of the state government spending is administered through Florida Forever, we were able to spatially represent nearly all the state spending. In addition, the five counties that were selected to represent local government spending had robust spatial data that was easy to work with. This also contributed to Florida's greater alignment percentage. It was difficult to align most of the spending from private organizations as few were able to provide the data we needed.

On the federal level for all states in this study, we had the greatest success working with data from the U.S. Fish and Wildlife Service. They recently completed a nationwide database of all tracts under their management, which we could generally align to transaction information through a tract number. This was not always successful but it was the best federal data we received. The U.S. Forest Service could only provide data in Florida. None of their acquisitions in the other states could be included in the analysis. The National Park Service could only provide larger generalized boundaries of their lands, so we rarely could align their transactions to spatial data. And as described earlier, the other types of federal programs – those that worked through state agencies and those that provided grants that were not coordinated by a state agency – were unable to provide spatial data for the projects that they partnered in.

Overlap between Spending and Strategic Habitat Areas

Our analysis shows that the percentage of land conservation spending *for which spatial data was available* that was used to protect strategic habitat areas varied by state. Figure 2.6 shows the overlap between strategic habitat areas defined in the SWAPs and spending that had spatial data associated with it. The percentages indicate the portion of the spending in the SWAP priority areas that could be aligned with spatial data. For example, in Massachusetts 68% of the spending data *that could be spatially represented* overlapped with the strategic habitat areas in the SWAP. However, that analysis was based on only 29% of total spending data that had spatial data associated with it (refer back to Figure 2.5).

Figure 2.6: Percent of Spending Aligned to Spatial Data that Protects SWAP Strategic Habitat Areas



Florida had the highest percentage with 89% of spending identified as protecting strategic habitat areas. Montana also had a high percentage at 74%. For Montana, this may be due to the fact that a large area of the state is considered high priority, thus a higher percentage conservation spending could be aligned with priority areas. The lowest percentage was Oregon at 34%. As described earlier, a major funding program in Oregon was the PortlandMetro Natural Areas Program which focuses spending around the Portland metropolitan area. However, the urban area around Portland does not have a lot of strategic habitat identified in the Oregon SWAP.

Use of this data on the amount of overlap with strategic habitat areas has several limitations. First, states employed different approaches towards defining strategic habitat within the state. Some included large portions of the state, not really identifying areas with the highest priority for

conservation, whereas other targeted more specific areas with the goal of conserving them. The limited availability of spending data linked to spatial information also limits the usefulness of the results presented here. We cannot say how representative the projects were that had sufficient data to be included in the analysis, so we cannot generalize from the results. Instead, the acreage and expenditure data we compiled should be considered a baseline that can be built upon to enable future analysis and use by land conservation programs and funding source. We feel confident that the conservation community will continue to improve upon the creation and release of spatial data so that more in depth analysis of the progress towards SWAP implementation can be achieved. Projects like this one should encourage the community to continue working in that direction.

States can benefit by working with spatial data associated with land conservation transactions. Spatial analysis will be most useful when there is a high quality SWAP map or other map of state conservation priorities. Spatial analysis enables the state to determine where land conservation funds are being used in relation to the SWAP's strategic habitat areas. It allows analysis that could show which funders, or types of funders, tend to protect these priority areas. It also enables the state to report on progress towards achieving its land conservation goals.

C. Policy Analysis

A key component of land conservation is the way in which states use policies and programs to direct funding towards activities that will achieve their conservation goals. We examined each state's land conservation policy environment to determine the degree to which states use policy to align expenditures for land conservation with protection of priority habitats identified in the SWAP. The study looked at funding from *all* sources – not just the state, but also the federal government, local governments, and private entities such as land trusts and other NGOs. Our policy analysis, however, investigates the *state's* policies, since it is the state that issued the SWAP and has an ongoing interest in its successful implementation. We recognize that the SWAPs are products of collaboration among a wide range of state conservation entities, and implementation depends on work by all the partners. From a policy perspective, the SWAPs are state-level plans so we focus on state policies, which include how the state can influence other land conservation partners.

We found five aspects of the policy environment that had an impact on land protection in general and alignment with strategic habitat areas in particular. These are the state's funding sources, land selection approaches, land protection approaches, the level of engagement of the state with non-state funding sources, and the management of land conservation information. Each of these is described below.

State Funding Sources

State programs are funded by a range of dedicated or appropriated sources. The states in our sample used a combination of annual appropriations from the General Fund, dedicated sales tax, fees for licenses or permits, severance taxes on natural resource extraction, documentary and stock transfer taxes, environmental penalties, license plate sales, and lottery revenues. Some of these funds were

dedicated to a state agency for conservation in general, and the agency could *choose* to use them for land purchases, whereas other sources were dedicated to land acquisition. Where open space bonds were used, one or more of these funding sources provides the funds to service the bond. Some funding programs require periodic voter renewal, and some are codified in amendments to the state constitution.

Conservationists in states with *dedicated* funding for land acquisition commented on the benefits of having a stable source of funding when they work with landowners that are considering selling their land or a conservation easement. Even limited revenue streams that are dedicated are important because state agencies know that funds will be available if matching funds are required, without worrying about the uncertainty of funding availability or variability in funding levels.

Land Selection

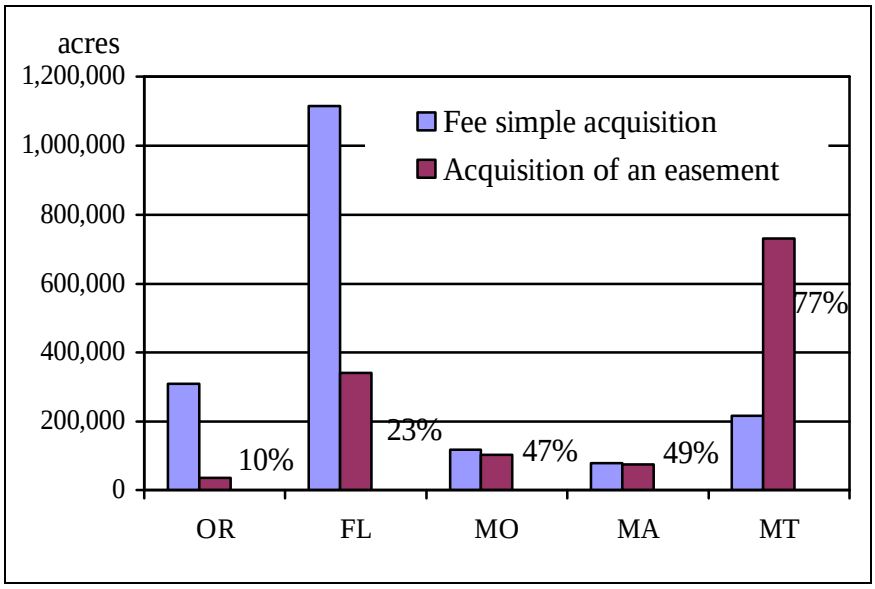
How organizations select which lands to protect with scarce acquisition funds is key to determining whether high priority habitat gets conserved. This project focused on land being protected for wildlife habitat, but that is only one of many competing priorities for land conservation. In addition to protecting wildlife habitat, governmental and non-governmental agencies also protected land for other ecological reasons, such as to support ecosystem services, to establish landscape level conservation, to protect groundwater, to protect important agricultural soils, or to sequester carbon. Other purposes for land conservation include parks and recreation, historic preservation, and to preserve the character of a local community. We used a broad definition of land conservation projects that could protect habitat, particularly because very little information about project priorities tends to be associated with spending and spatial data for each project. Because these land protection projects were driven by many different priorities, we would not expect to see perfect alignment between the spending and strategic habitat areas in the SWAP. The value of this type of analysis is that it can enable the state to understand which spending programs do tend to protect land in strategic habitat areas and which ones do not.

We did find that most organizations believed they were guided by strategic considerations, rather than pure opportunism, when selecting what lands to protect. The greatest difference seemed to be the extent to which a land conservation organization took the strategic leap and was both proactive with landowners in terms of pursuing high priority areas and willing to turn away potential donations that did not match SWAP priorities.

Land Protection Approaches: Fee vs. Easement

There was a high level of variability when we looked at state preferences between two permanent land protection options: fee simple transactions vs. easements. For example, easements were used on only 10% of the acres protected in Oregon, yet it was the preferred mechanism in Montana, where 77% of the acres conserved were protected with easements (Figure 2.7).

Figure 2.7: Comparison of Acreage Protected by Easements, 1998-2007



In general, arguments for relying on fee simple purchases revolve around control, with the government or NGO owner able to develop management plans and conduct restoration to ensure the conservation values of the property are maintained or improved. Arguments in favor of easements revolve around financial benefits. With easements, conservation organizations are able to protect more acreage for the same amount of money, the property remains on the tax rolls, even if the tax level is reduced, the government does not incur management or oversight costs, and communities maintain working landscapes. However, the costs associated with monitoring and enforcing easement agreements can reduce some of the perceived financial benefits.

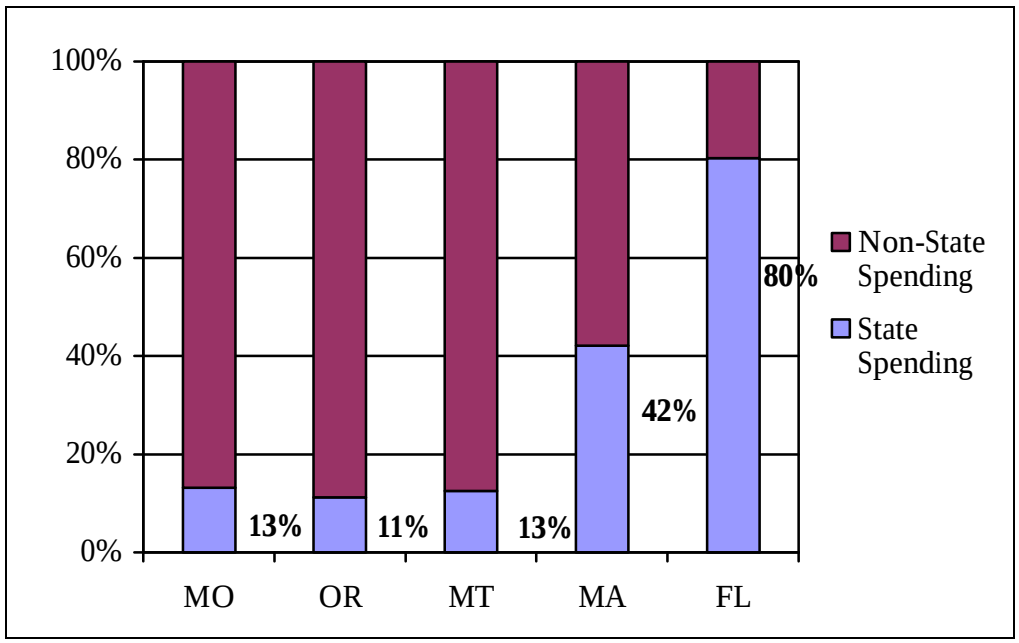
State agencies' preference for fee or easement transactions can have an impact on protection of land in strategic habitat areas under certain circumstances. For example, if there are working landscapes in those strategic areas, landowners may be more receptive to easements. On the other hand, if there are parcels that require a high level of management to maintain conservation values (such as land that would benefit from controlled burns) or if parcels require restoration, fee simple purchase by an organization that will undertake required management actions may be the better protection approach.

State Interaction with Non-State Funding Sources

The way the state interacts with non-state funding sources may offer the greatest opportunity to influence land selection and direct funding towards strategic habitat areas. Although the states analyzed in this study were not selected to be representative of spending patterns across the country, they do offer a perspective on state vs. non-state funding levels. Figure 2.8 shows state spending as a percent of total spending, which ranges from a low of 11% in Oregon to a high of 80% in Florida.

Across the five study states, non-state (e.g. federal, local government, and private sectors) funding totaled nearly $2 billion from 1998 to 2007.

Figure 2.8: Comparison of State Spending to Non-State Spending, 1998-2007



If state agencies work effectively with other funding sources, they have the potential opportunity to guide use of a significant amount of financial resources to protect land in their state.

For this study, we grouped federal spending programs into three categories based on how much influence the state might have over land selection. The state can have a great deal of control over funds from federal agencies that are coordinated by a state agency, such as the USFS Forest Legacy Program (FLP), although not all state agencies may have strategic habitat protection as their highest priority. Federal funds that go to partners such as NGOs, land trusts, local governments, individual landowners, and sometimes even state agencies through a competitive process are more difficult to influence unless the state has developed relationships with these organizations and has encouraged them to help protect strategic habitat areas. Good examples of how states have been effective at influencing land selection with federal partnership funds are Missouri and Massachusetts. These states have created positions for individuals to work with NRCS to explain the state's strategic habitat areas and to influence direction of NRCS funding to lands in those areas. The state has the least control over spending by federal land management agencies that are purchasing lands for their own agencies (such as the National Park Service).

We found most states had good relationships with land trusts and other NGOs that were active over large geographical areas of the state. State representatives pointed out the difficulty of interacting with a large number of smaller land conservation organizations and welcomed the opportunity to

work with a statewide land trust coalition, if one existed. In many states land trusts and NGOs are recognized as being important to the state for their technical and scientific work to identify important land parcels, relationships with local landowners, and transactional skills. This work is often more important than the funding they bring to the acquisition process.

We did not find any state that was actively involved with land protection by local governments. In part this is due to the large number of local jurisdictions within a state and in part because states do not want to interfere with local government priorities. However, local jurisdictions are becoming more important sources of land conservation funding as more municipalities successfully pass environmental bond measures to fund land protection with local property tax proceeds. Although use of local funds is determined by the jurisdiction, the state has an opportunity to educate local governments about strategic habitat that is within their jurisdictions and encourage the local entity to consider those lands for protection.

Management of Land Conservation Information

The final aspect of the policy environment that we explored was management of land conservation information. As discussed in the sections on spending and spatial analysis, we did not expect the level of difficulty we encountered to assemble the data required to answer the question posed by the project: How well-aligned is spending on land conservation with the priorities in the SWAP? To answer the question, a state needs a good baseline of what lands are within strategic habitat areas and which of those lands are unprotected. States also need an effective process to gather spending and spatial data about ongoing land protection by all sources – public and private – in a systematic way to be able to assess progress towards the state's goal. Although we did get access to a lot of spending and spatial data related to land protection, we had to struggle to put together a data set we could use for our state alignment analysis. None of the states in the study has a centralized collection of spending and spatial data for all levels of government, nor are we aware of such a database in any other state.

Why is this type of data set important? As Lord Kelvin said, and management gurus repeat, "If you cannot measure it, you cannot improve it." This holds for land conservation activities. States have put a great deal of effort into developing and implementing their SWAPs. To be able to assess their progress going forward, though, they need to collect and analyze expenditure, acreage, and spatial data about all the land being protected in their states.

Analysis of a state's land conservation policy environment is useful to states because it can clarify choices the state is making about how it pursues land conservation. We include highlights of each of the study state's land conservation efforts in Appendix E. Policies are established by the state, and although they may be thought of as being set in stone, they can be changed by the state if they are not leading to the types of land conservation results the state would like to see. Changes to a state's policy environment may not cost much, yet they could prove to be more significant than finding additional sources of dollars if the changes were to clarify priorities and help align funding with those priorities.

D. Analysis of Costs to Conserve Unprotected Priority Areas

As states progress in implementing their SWAPs, estimating the future costs of land protection becomes critical for understanding which land conservation strategies are more cost-effective and for encouraging states to consider use of creative funding mechanisms. In this section we provide a general (average) statewide cost estimates for conserving lands within state strategic habitat areas, which, as of the end of FY 2007, had not yet been protected. All costs and expenditures were collected for the years 2006 and 2007 during an over inflated real estate market, therefore the costs reported here represent high end estimates. Also, since we used 2007 as the cut-off year, our costs may be overestimated because the amount of SWAP lands requiring protection was not adjusted for 2008 and 2009 acquisitions.

In our analysis of past land conservation expenditures and acreages (Section C) we addressed those lands protected via fee-simple purchase and easements. In this section on future costs, we estimate land conservation costs based on four separate conservation strategies: fee simple purchases, conservation easements, land rentals, and paying private landowners to manage for wildlife habitat values. For our fee-simple purchase estimates, we add annual management costs. For the easement strategy, we account for up-front, one-time transactions costs. To estimate the average cost of each conservation strategy we collected data from federal, state, and local governments and private sources, along with data compiled in the spending and spatial sections of this analysis, the National Agricultural Statistics Survey (NASS), and cost studies conducted by state universities and/or state agencies.

Estimated Costs to Protect Unprotected Strategic Habitat Areas

Table 2.4 summarizes the estimated *per acre* costs for each protection strategy in each state in our sample. Fee-simple purchases and conservation easements in all states are the most expensive. Florida and Massachusetts have the highest costs, most likely due to scarcity and demand for land in these states. Rental and management costs are the least expensive options.

Table 2.4 Average Protection Cost per Acre

	Oregon	**Montana**	**Missouri**	**Florida**	**Massachusetts**
Protection Strategy	(Costs in 2007 dollars)				
Fee-Simple Purchase	$4,434	$2,562	$1,600	$15,437	$7,206
Management Costs	$14	$5	$28	$15	$19
Conservation Easement	$2,205	$546	No data[1]	$3,415	$6,653
Rental Agreement	$52	$19	$47	$34	$49

[1] We did not have enough data for a reliable estimate of easement costs for Missouri.

Table 2.5 summarizes the total cost of conserving currently unprotected habitat priority areas within the states over a 30-year time period and compares it with the 10-year expenditures collected in the spending analysis. For the 30-year costs, we assume that the total acreage to be protected is divided

into 30 equal annual increments. With the exception of the base year, we also assumed a 3% annual increase in land costs and that all protection strategies are equally viable in all parts of the state.

Table 2.5 Comparison of 30-Year Costs and 10-Year Expenditures

	Oregon	Montana	Missouri	Florida	Massachusetts
Unprotected acres (million)	6	63	10	10	2
Protection Strategy ($2007 billion)					
Fee-Simple Purchase	$41	$254	$26	$250	$14.2
Management Costs	$2	$9	$0.4	$0.3	$0.037
Conservation Easement	$20	$54	No data[1]	$77	$13.1
Rental Agreement	$9	$33	$0.8	$0.8	$.096
Project Results 1998-2007					
Expenditures ($billion)	$0.4	$0.4	$0.2	$3.4	$0.9
Acres Protected (million)	0.3	0.9	0.2	1.5	0.2

[1]We did not have enough data for a reliable estimate of easement costs for Missouri.

Our estimates for the total cost of future land conservation efforts show fee-simple acquisitions and conservation easements are the most expensive land conservation options. Rental costs although less expensive, would continue to be incurred after the 30-year time period, making it the more costly option in the long term. In contrast, land protected through fee-simple purchases and perpetual conservation easements require no further payments, with the exception of the cost of land management. The least-cost option would be to pay existing landowners to manage for biodiversity values. For example, Florida and Massachusetts spent more on land conservation over the 1998-2007 time period than what it would cost to pay landowners to manage the entire remainder of unprotected priority areas over a 30-year period. The flexibility of rental agreements may be a practical option for some states as conservation priorities shift in the face of climate change.

Factors such as the degree of land scarcity and competition for other uses, as well as the size and location of a state's strategic habitat areas, will certainly be driving forces in overall state cost estimates. For example, overall expected costs are lower in Oregon and Massachusetts than in other states because there are fewer SWAP lands left to protect. The impact of land scarcity on overall costs is demonstrated in Florida and Montana. Although estimated fee-simple costs are roughly the same for Florida and Montana, Florida's land conservation area is less than one-sixth the area of Montana. Our analysis shows that more accurate estimates of costs could help states extract trends and make better informed decisions on how to fund future land conservation goals.

Factors Affecting the Cost Analysis

There are several factors which affected the cost estimates for the different protection strategies and should be considered when conducting this sort of analysis in the future. First, we relied to a great extent on data collected for the spending and spatial analysis. Therefore, the data challenges referred

to in Table 2.1 also affected the cost analysis and limited the pool of cost information on which to base an estimate of state-wide average costs.

Second, the easement, rental, and management cost estimates do not take into account the features of the land such as land cover type. For fee-simple purchases, we were able to conduct weighted land costs by land cover types for all states except Montana. However, the types of land cover and level of detail varied between states. Location also was not considered, and this could have a significant impact on land protection costs particularly where development pressure is high.

Third, there was no differentiation between management and restoration costs. Management costs are accrued in perpetuity and can be relatively low if there is good quality habitat and there is little intrusion. On the other hand, restoration costs can be extremely high at the onset and then can taper off if restoration is successful. In addition, the definition of habitat management activities varied between conservation organizations. Some organizations excluded certain activities which are necessary for the proper management of habitat, while others included activities which were not directly relevant to habitat maintenance.

Fourth, we could not estimate *per acre* transaction costs for easements, and therefore these costs are not incorporated into the overall estimate conserving unprotected SWAP areas via the easement strategy. However, transactions costs can be substantial and should be considered when determining whether easements are the best land conservation strategy for a particular area. The range of easement transaction costs for the five case study states is shown in Table 2.6.

Table 2.6: Easement Transaction Costs in Five States

Oregon	Montana	Florida	Missouri	Massachusetts
$15,570 - $20,789	$12,864 - $14,730	$52,026 - $54,526	$8,924 - $15,231	$9,730 - $44,834

Lastly, enforcement costs for easements are not included in this analysis. Enforcement costs are incurred when a dispute or violation of an easement agreement arises. According to the Land Trust Alliance, a land conservation organization should set aside a minimum of $50,000 for a legal defense fund to effectively enforce approximately fifteen easements. An additional $1,500 to $3,000 is needed for each easement beyond that (Doscher, 2007). While our analysis does not consider enforcement costs, these are significant to the overall financial viability of conservation easements.

E. Perspectives on Conservation Finance

This project convened a workshop of experts in conservation finance and individuals with extensive experience working with SWAP implementation to discuss potential financing mechanisms to protect more strategic habitat area. The workshop participants drew several conclusions.

First, conservationists should not hesitate to estimate the costs of protecting conservation lands identified by the SWAPs. Choosing not to estimate costs out of fear that they would be too daunting does not change the reality of what the implementation of the SWAPs are likely to cost. Having an

estimate in place allows people to compare the cost of habitat protection to other state or national priorities. Current estimates, based on very limited data, are not greater than other projects that the nation or individual states have funded. Also, by understanding costs, states may choose to use greater precision in identifying strategic habitat areas for protection.

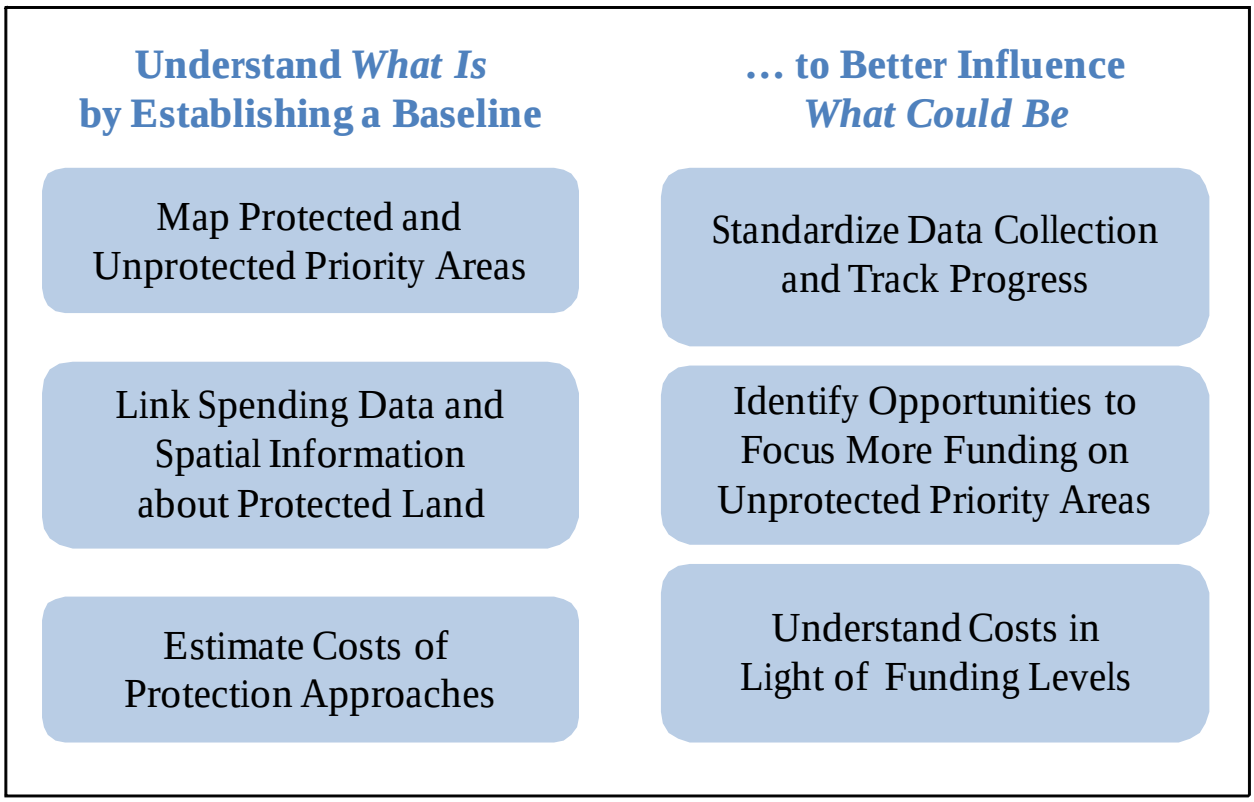
Second, if states prioritize which habitats are most important to protect, they will need to put more emphasis on focusing state funds on protecting land in strategic habitat areas. This would mean increasing alignment of land protected with funds from state agencies. It also would mean focusing state funds that are distributed as grants to local governments and/or private organizations in a similar way. If the state wants to allocate its funding to areas it has identified as most important, it also could consider land owner incentive programs, such as state tax incentives for the donations of easements, to see how use of these funding sources could achieve the greater alignment.

Finally the largest source of funding for conservation in general is connected to regulatory requirements for clean water and clean air, and there may be opportunities to link mitigation funding to the protection of priority habitat. This would require states to build bridges between their Fish and Wildlife agencies and regulatory agencies and jointly explore ways in which environmental protection programs might be modified to create incentives to protect strategic habitat areas. Regulatory enforcement often creates new sources of value, such as pollution credits, that can be traded. The opportunity to participate in markets for these credits could attract private financing entities and new sources of money to protect strategic habitat.

F. Framework to Understand a State's Conservation System

We have extracted lessons from this research project that might help other states think about their land conservation systems in a more structured way. We offer this framework as a recommendation about means by which each state could evaluate its own land conservation system and identify possible changes that might yield greater alignment between conservation spending and protection of strategic habitat areas. The framework is depicted in Figure 2.9, and each aspect is described below.

Figure 2.9 Framework to Understand a State's Conservation System



The land conservation system is made up of expenditures (represented by spending data from each funding agency), land areas protected (represented by spatial data), the policy environment, and costs of land protection.

Map Protected and Unprotected Priority Areas

Many states created maps as part of their SWAP to show locations of the strategic habitat areas identified as needing to be protected. Working with the states in the study, we found that the SWAP map frequently was one of several that were being used by the conservation community to guide land protection decisions. Both Massachusetts and Florida had statewide activities to integrate the SWAP priorities with other conservation priorities and thus create a single consensus map. We found that the existence of a map with clear indication of which lands were considered most important to conserve, and which lands were already protected, was very important to members of the conservation community as a decision criteria for selecting lands to protect.

Link Spending Data and Spatial Information about Protected Land

There were no states in our study that had a centralized data collection effort to record land conservation in the state, even for recent years. Most states track state agency spending and acreage protected, but they do not always link spatial information with that spending data. States could move

more quickly towards their conservation goals if they understood all the land conservation funds being invested in their state – from federal government sources, local government sources, and private sources – in addition to the various sources of state funding.

We did find that a great deal of spending, acreage, and spatial data is available, but it is maintained by individual programs and not consolidated by any organization. Some organizations maintained sets of both spending and spatial data that could be linked to specific parcels. Others had both sets of data, but were unable to link them.

Estimate Costs of Protection Approaches

We found a wide range in costs associated with different land protection approaches – fee simple purchase, easements, and land rental – in each of the states. As discussed above, it is difficult to collect this type of data and it is difficult to draw conclusions about average costs without a sufficiently varied sample. Average costs could be made more accurate by having more data points, but the best data would come from acquiring detailed costs on a local level that includes land cover type and management, restoration, transaction, and enforcement costs. States would benefit from learning about the range of per-acre costs throughout the state, as well as the factors that influence those costs, to be in a better position to estimate what financial resources would be required in the future. This would allow decision makers to have better informed policy options concerning which land conservation strategies to pursue.

Standardize Data Collection and Track Progress

The conservation community in each state would benefit from having access to baseline information about annual spending, acreage, and spatial protected in the state, as we recommended above. More valuable would be up-to-date information about ongoing land protection activities, especially if they were measured against specific goals, such as protecting strategic habitat areas in the SWAP. To be able to report on progress against such plans, a single entity, most likely a state agency, needs to be responsible for collection and management of data about future land conservation projects.

We acknowledge that collecting historic data is challenging. However, establishing data collection approaches to gather spending and spatial information about land parcels as they are protected would not need to be as difficult. Many agencies with whom we spoke said they would be willing to provide standardized data if they were told what was needed. Figuring out effective yet simple mechanisms to gather data from a large number of local governments and, in some states, a large number of land trusts and other NGOs may be an issue, especially given staff constraints, funding issues, and concerns about landowner privacy that the local entities face. However, we found that many local government programs using bond measures had developed effective way of managing land conservation information, and they had very good data about their land protection projects because they were committed to reporting progress to the local taxpayers. Gathering data from some federal programs was a problem, but if states suggest a common data collection framework, perhaps federal programs will develop mechanisms to provide the data. Despite the challenges, it

seems the time has come to ensure that information about all land protection activity is available at a centralized point.

Based on what we learned in this study, the project team recommends that the data collection responsibility be a state function. The state has an advantage in that it has the ability to establish rules and require participation, such as Montana has done to require reporting of standardized data about easements. There may be opportunities for national NGOs to assist with this type of work, building on their experience with different types of land conservation datasets they currently are establishing. The experience of the NGOs could be useful to states as they develop their databases and establish processes to maintain them. The NGOs' national perspective would also be valuable to ensure that there is sufficient consistency across state databases to enable national analysis.

It is important to let a wide range of constituencies know what land conservation goals have been set and what type of progress the state is making. In addition to the usual constituencies state agencies may consider, such as conservation partners, landowners, and donors, they also might think about how best to communicate with other important constituencies, such as taxpayers and legislators. We found that local governments seem to be focused on data collection with an eye to ensuring transparency for their actions. Perhaps this is because the local governments are closest to the taxpayers funding their conservation work. The Massachusetts Office of Energy and Environmental Affairs published a 2008 Land Protection Report, and it is a good example of how reporting on progress can be done in a very compelling manner. The report focuses on state spending, with a few references to the amount that state money leveraged from other public and private sources.

Identify Opportunities to Focus More Funding on Unprotected Priority Areas

State funds are not the only resources that can be used to protect SWAP priority habitats. In fact, SWAP coordinators often talk about the importance of the state's conservation partners. There are several things state agencies could do to direct more existing non-state land conservation dollars towards priority areas. These include providing more focus for state funds, influencing land selection by non-state funding programs, identifying and attracting non-local funding sources, such as the federal Scenic Byways Program), and testing some innovative market-based conservation finance ideas tied to environmental regulations (e.g. mitigation banking or payments for ecosystem services).

State agencies have available to them many possible ways of interacting with conservation partners to influence land selection. For example, states have a great deal of control over land selection for properties being acquired using state funds or using federal funds that are directed through a state agency (such as FLP) or using federal funds that a state agency competes for and wins (such as NAWCA). The other sources of funds get used according to policies set up by other levels of government or private organizations. But where these programs' money gets used can be influenced by the state.

State influence can start with the simplest outreach by providing information about the SWAP and state priorities on an agency website. Through outreach efforts, the state can influence where local governments and private NGO's use their conservation funds. The next step up may be to provide guidance about state priorities by distributing an easy-to-use map. There could be more directed outreach where the agency talks to organizations about state priorities, learns about other groups' priorities, and works to find ways to make protecting priority habitats in the other group's interest, too. Beyond that, the state can influence land selection by providing financial incentives to groups that use state funds to protect specific areas, perhaps in the rules of a grant program or even through use of a state income tax incentive program for donations of easements.

Understand Costs in Light of Funding Levels

If states had access to data that showed the strategic habitat areas and the unprotected parcels within those areas, and they had good data on the costs to protect different types of land in different areas, they could generate a good estimate of the financial resources the state would require to protect those areas. Using data on historical land protection funding, they could make a realistic assessment of the amount of funding that might become available for land protection over some future time frame. In light of the financial challenge and availability of potential funding, they could determine if there was a gap and what its size was. Depending on the size of the gap, the state could either look for additional funding sources, or the state could reassess its priorities and refine its definition of strategic habitat to focus funding on its highest priorities. Choosing not to estimate costs out of fear that the total would be too daunting does not change the reality of what land protection and implementation of the SWAPs is likely to cost. And failing to establish priorities and work to get the highest priority lands protected before it is too late could compromise success of the SWAP.

Summary

The purpose of this project was two-fold. First, it was to determine the extent to which spending on land conservation has aligned with the priorities in the SWAPs for five states. Second, based on the findings from these five case studies, the project identifies issues and recommendations to improve state-level conservation systems. We characterized the land conservation system in each state. However, we were unable to find sufficient data to be able to evaluate how well land conservation expenditures are accomplishing the stated habitat conservation objectives. Despite the data limitations, we used our experience to create a framework to help other states understand their own land conservation systems and to offer ideas about ways states might achieve better alignment between land conservation investments and strategic habitat areas.

We would like to see the conservation community – at the state level or in general – consider ways to establish a clear baseline and create a robust data set of spending and spatial data relating to land conservation projects. Having access to this information could enable people to better understand the patterns of conservation in the state and thus to better guide land protection in the future.

III. Approach

This section describes the approach the project team used to gather and analyze spending, acreage, spatial, policy, and cost information in each of the study states.

A. Expenditures and Acreage

We collected spending and acreage data from all types of funding programs active in a state, including state, federal, and local government programs and private programs (land trusts and other NGOs). For federal and state programs, we started with TPL's Conservation Almanac and updated it through phone interviews and email correspondence. For the state government level we contacted all state agencies and programs involved with land conservation. For example, in Oregon we collected data from the Oregon Watershed Enhancement Board and the Oregon Parks and Recreation Department, both of which use Ballot Measure 66 Lottery proceeds to fund land acquisition. For federal programs, we approached the agencies directly and through state counterparts. The project's focus was on conservation activity for acres where permanent protection was achieved, so we collected expenditure data and acres associated with fee-simple purchases, permanent easements, and temporary (15-30 year) easements.

At the local government level, we used TPL's LandVote Database to determine the most active counties and cities in terms of land conservation spending. LandVote tracks information on all conservation finance ballot measures across the country. Because it was not feasible to contact every county or city to collect conservation data, we collected data from those counties or cities that have passed conservation finance measures of $50 million or more. This approach was chosen based on the assumption that counties and cities that have a vested interest in land conservation are more likely to be actively acquiring land and have up to date records for these transactions.

To gather data from private land trusts and NGOs we used a similar approach. Based on in-state recommendations we collected data from the largest and most active private organizations. We estimate that our analysis captures the majority of private land conservation spending that occurred in our study sample.

B. Spatial Information

We gathered spatial data from as many sources as possible. While many efforts are underway in the conservation community to work with spatial information, there are still many agencies and organizations that do not yet have the appropriate technology in place or are not willing to share their spatial information.

Method for Aligning Spending Data to Spatial Data

Analysis of the overlap of state wildlife priority areas with land conservation purchases and easements required development of a spatial database in which we identified the parcel boundary of each transaction record. In the initial development of this project, we assumed that the information on the amount spent for a given parcel of land would either exist as an attribute in the spatial data provided or in tabular format that could be easily joined to the spatial records. Unfortunately, this was not the case. It was rare that transaction (i.e., expenditure) information existed as an attribute in the spatial data provided to us, with the Florida Forever program and Portland Metro program as notable exceptions.

More common was a situation in which we received spatial data with few attributes other than an area name, acreage, or transaction closing date to align with the transaction records listed in a spreadsheet. The spreadsheets we received had a wide variety of attributes that made creating a database with consistent fields difficult. Due to challenges in working with the data provided, we generated a workflow to standardize transaction spreadsheets via a specialized upload into a Quickbase database management system. This system produced a standardized spreadsheet describing all the transactional information provided to us with consistent fields and data types. (We include a list of recommended attributes for a database of this type in Appendix D.) This standardized transaction table also created a 10 digit unique id number that we could use to join the transaction data to spatial records. This was completed through a manual process whereby we compared the fields in the spatial data and transaction table to help determine which spatial record represented the spatial boundary of the transaction described in the spreadsheet. This comparison typically used area name fields, close dates, acreages, provider id numbers, and/or comments to determine the correct spatial record. Once identified, the transaction's unique id number was edited into a field in the spatial database, upon which a "join" could be completed, allowing for a spatial record that shows the attributes in the transaction table. This methodology was time consuming, but it provided a consistent database of transaction records connected to a spatial record with a high level of confidence.

A major concern in creating this spatial database was catching any double counting of acres or dollars between programs at different levels of government that contributed funds to acquire the same parcel. One step we took to prevent this was to conduct a GIS "Select by Location" analysis to identify where property overlaps might exist before it was uploaded into a master state database. If a property was selected, then we conducted further investigation to determine how best to work with the dual datasets and bring them together into a single spatial record.

Method for Determining Percent Spent on Strategic Habitat Areas

The transaction data that could be aligned to spatial data was used to generate statistics on the percentage of dollars spent and acres conserved that overlapped with the state wildlife priority areas, as designated in the respective State Wildlife Action Plans. The first analysis was to determine the percentage of total dollars spent on wildlife habitat priority areas by year and level of government.

The spatial database includes a level of government field that identifies the source of the funding to determine if it came from a private/NGO source, local government, state agency or program, federal agency budget, a federal program with no state partner or a federal program with a state partner. These values were calculated by using the GIS Intersect tool to identify the segments on each property that overlap with strategic habitat areas. This produced a spatial dataset that displayed only the places on each property designated as a strategic priority. This was used to calculate the percent coverage of wildlife habitat priorities on each property. This information was then used to calculate the percentage of the total cost of a property that could be attributed to protecting a strategic habitat area.

Our next analysis was to determine the percentage of total acres obtained that overlapped with strategic habitat areas by year and level of government. This was completed in a similar fashion as the spending analysis, using the percent overlap with wildlife habitat priorities for each property statistic and applying that to the reported acreage of the project to generate the number of wildlife habitat priority acres protected. This was a straightforward process for the by-year analysis.

Applying acreages by level of government was more difficult, as many projects received funding from multiple levels of government. In this analysis, we allocated the acreages for a project to the largest funding entity. An example would be if 100 acres were protected using funds from a private donor that gave $50,000 and state funding of $100,000, then the 100 acres were credited to the state level of government. If two funding programs provided equal funding, then the acres were credited to the more local entity, such as a local government because local dollars were required in order for the state match to be made available.

C. Challenges in Data Collection

We faced many challenges gathering data from various programs, organizations and agencies, as summarized earlier in Table 2.1. In some circumstances we were unable to gather all of the data we needed because some programs had not created GIS data, which allows for spatial representation of a parcel. Other organizations denied our requests for data because of privacy concerns or lack of staff capacity to respond[4].

Some other common problems centered on the initial precision of data and the potential for double counting acres and/or expenditures between programs and agencies. In many instances, financial information was created and distributed by one group and the spatial information was created and

[4] We believe that in some instances that asking for and collecting private (e.g. land trusts) spending data prevented us from obtaining existing spatial data. If we had just asked for location data with no reference to spending, land trusts may not have hesitated to provide more spatial information.

distributed by another group within the same organization or agency, with little or no communication during data collection. Therefore, joining two separate datasets for a particular location to analyze spending alignment proved to be difficult and involved a great deal of manual work. In many instances we were not given enough information to tie spending and spatial records together and those records are not included in our analysis.

In some instances, spatial data was created as "blobs" rather than individual parcel boundaries. For example, the National Park Service records only provided an entire park boundary rather than showing individual parcels that were acquired over time. We could not use much of this type of data to determine the degree of alignment with strategic habitat areas. We could only determine alignment when an entire park boundary fell completely within or complete outside of a strategic habitat area.

Finally, we had to sort through situations where protected acreage may have been double counted by different agencies. Conservation projects often occur as a result of a "Funding Quilt," where multiple partners at different levels of government contribute to a single acquisition. In these cases, each partner may count all of the acres, and sometime all of the dollars, in their respective data sets. We reduced the risk of double counting dollars and acres by using spatial data as a reference and also by asking data providers to list all funding partners that were involved in an acquisition. In this way, we were able to cross reference spreadsheets for possible double or triple counting. In summary, many of these challenges resulted in many data gaps due to the lack of information from providers. Therefore our results should be used as a baseline for continued analysis.

D. Policy information

We gathered information about the policy environment in each state from websites of the major funding programs, including state and local government agencies and private organizations. We also did general web searches to uncover references to land protection activities in each state. The major source of information, though, came from extensive telephone interviews with representatives of major programs in each state. Due to time and budget constraints, we did not try to talk people in every program. We started with recommendations from the SWAP coordinator, included individuals who other project members spoke to who seemed particularly knowledgeable about funding programs, and we followed up with individuals who were recommended as information sources in the course of the state debriefings.

E. Development of Cost Estimates

We discuss the methods we used for estimating state wide average prices for the three conservation strategies, plus management and transaction costs.

Cost Estimation Methods

To determine the cost of conserving unprotected priority areas we first calculated the acreage of protected and unprotected areas using the database most representative of the overall land conservation activity within the state. For all states, except Florida, we used the Protected Areas Database of the United States (PAD-US) for the analysis. For Florida we used the Florida Managed Areas (FLMA) database. Descriptions of these databases are located in Appendix F.

With the PAD-US and FLMA databases we completed an overlay analysis with the priority areas identified by each state in GIS using the intersect function to determine the acreage of total unprotected conservation priorities across the state. The acreage of unprotected conservation priorities was estimated to be approximately 6 million acres for Oregon, 63 million acres for Montana, 10 million acres for Missouri, 10 million acres for Florida, and 1.5 million acres for Massachusetts as of 2007.[5]

To estimate the average cost of each protection strategy we collected data from federal, state, and local governments and private sources, along with data compiled in the spending and spatial sections of this analysis, the National Agricultural Statistics Survey (NASS) and cost studies conducted by state universities and/or state agencies. In addition, we weighted costs by land cover types for fee-simple purchases in all states except Montana. Our original intention was to weight costs by land cover type for each protection strategy, but we lacked sufficient spatial data for conservation easements and rented lands.

Method for Calculating Costs of Fee-Simple Purchase Acquisitions

We estimated statewide average per-acre fee-simple costs in two phases. First, we collected cost data from the various sources mentioned above, and then, to the extent possible, we weighted those costs by land cover type found within the unprotected SWAP conservation priority areas. We were able to weight costs by land cover types for all states, except Montana. For Montana, and we relied on the data collected on fee-simple lands and data from the NASS. For Oregon, Montana, and Massachusetts we used the National Land Cover Database 2001 (NLCD 2001). For Florida we used the Habitat and Landcover database (GFCHAB_03) from the Florida Fish and Wildlife Conservation Commission (FWC). For Missouri we used a GIS dataset called Lulc05. A description of these databases is in Appendix F.

To estimate land conservation costs for fee-simple purchases by land cover type we overlaid the land acquisition parcels from 2006 and 2007 with the each state's conservation priorities and used a subset of parcels to calculate a cost estimate. We then determined the land cover for each parcel

[5] This excludes impervious, high intensity urban, low intensity urban, barren, and open water land cover categories because we consider them unsuitable for terrestrial wildlife habitat.

using the various databases described above. We collected spending data only from acquisitions that had over 65 percent of one land cover type.[6] From this analysis we were able to estimate an average cost for fee-simple lands within each state.

Method for Calculating Management Costs

We define management costs as all practices and/or investments which contribute to the overall integrity of the habitat protected, including site construction, biotic surveys, habitat restoration, habitat maintenance, public services, reporting, office maintenance, field equipment, operations, as well as contingency and administration (unforeseen costs and overhead)[7].

To estimate habitat management costs we contacted land trusts, local governments, and federal and state agencies. Due to time and budget constraints, we could not conduct an in-depth analysis of every cost involved in managing fee-simple purchases. As a result, we relied on annual budgets and management plans. Many land management entities could not provide management cost data either because (1) they did not keep track of these types of costs as separate from other expenditures; (2) management costs varied significantly from one property to another for a variety of reasons (i.e., land cover, organization goals); and/or (3) the available data represented only the portion of the property's total management cost that a particular agency funded.

We estimated the average statewide management costs by weighting the costs reported from each organization by the total acreage managed by that organization. For nearly all sources, we adjusted estimated costs to 2007 dollars. Some of the costs, however, could not be associated with a particular year.

Method for Calculating Cost of Establishing Conservation Easements

Cost data for establishing conservation easements is based on expenditure data from federal programs such as the FRPP, CRP, and WRP, state and local government agencies, and private land trusts.

Method for Calculating Costs of Easement Transactions

We define transaction costs as all the practices involved in the establishment of a conservation easement. These include initial site visits, pre-closure "walk throughs"; landowner negotiations; appraisals; project planning, coordination, and documentation; agency coordination; title evaluation;

[6] For a more complete analysis of how the spending and spatial data was collected, see Section II of this report.
[7] Personal communication, Joanne Rodriguez,.Center for Natural Lands Management, August 2008.

escrow; legal assistance drafting and recording the easement; and preparing the initial baseline property report[8].

Transaction costs associated with establishing conservation easements were obtained by contacting land trusts and federal land conservation programs. As with management costs, some land trusts could not provide transaction cost data either because they did not track these costs separately from other expenditures, or because costs varied significantly from one property to another due to their characteristics. Thus, an "average" cost would be misleading.

We calculated the statewide transaction cost per easement by adding up the costs provided by each organization and then dividing it by the number of organizations. When necessary, we adjusted costs to 2007 dollars.

Method for Calculating Cost of Rental / Lease Agreements

Comprehensive data on rented costs by land use type with acreage was not available. Our overall estimate represents an average of rental rates for a limited number of land use types. Information on land rental rates is limited to mostly crop, pasture and grasslands, and does not, for the most part, include land cover types such as forestlands or wetlands. As a result, the statewide average rental rates may be biased toward the cost of renting agricultural lands.

F. On-line Meetings with Conservationists in each Study State

When we completed our data gathering and initial analysis, we conducted on-line meetings with conservationists in each state in the study. This worked well to minimize travel costs and time and to involve a large number of people in each state who also were geographically dispersed. We used the ReadyTalk system that allowed each participant to view the team's PowerPoint presentation via their own internet connections and to listen to the presentation and interact with questions and comments by phone.

During the on-line meetings, we described the purpose of the project and how we approached the data gathering in each state. We displayed the results of our analysis with maps, charts, and graphs. The participants on each call were very responsive and provided excellent feedback about potential sources of data, alternative interpretations of our data, and concerns about our conclusions or about how information about their state might be made public.

[8] Ibid

G. Workshop: Conservation Finance and SWAP

We conducted a workshop at Defenders of Wildlife's Washington, DC office to summarize our findings and to brainstorm ideas from conservation finance that might be useful to increase funding for protection of strategic habitat areas defined in the SWAPs. The workshop participants included conservation finance practitioners and individuals with a lot of on-the-ground experience with SWAP implementation. (See Appendix A for the list of participants.)

IV. Deliverables

The deliverables of this project are designed to communicate to the wider conservation community the results of our research and analysis. We prepared five state Case Study Reports (Florida, Montana, Oregon, Massachusetts, and Missouri) documenting our research in each state. Land conservation practitioners throughout the United States can use the case studies to better understand the conservation system in their own states. We also provided the spending, acreage, spatial, and cost data to the SWAP Coordinators. This Synthesis Report is written for conservationists at all levels of government and in private organizations to explain both the value and the challenges of understanding the conservation systems in their states. We also will incorporate our findings into publications and presentations to encourage the broader conservation community to invest in developing better understanding of the spending and spatial details of land conservation programs and how well they align with strategic priorities.

A. Case Studies: 5 State Reports

We prepared a State Report for each of the five states in our study. The state reports include the data we collected, our analysis, conclusions, and recommendations. A draft of each state report was reviewed by project participants and the project steward and their comments were taken into consideration in the final report. The State Reports will be posted on the National Council for Science and the Environment (NCSE) website, as well as on the websites of Defenders of Wildlife and the Trust for Public Land.

B. Synthesis Report

This Synthesis Report describes the overall results of our study. We believe that the information we gathered will be valuable to other states interested in protecting more of their strategic habitat areas. In the report we address the limited availability of information about the funding behind land that has been protected in each state by the wide range of funding programs from federal, state, and local government funding agencies and private organizations. We also discuss difficulties states face if they want to undertake the type of spatial analysis we attempted in this study. Our intent is to provide states with a better understanding of the value that could accrue were they to develop a spatial baseline and a robust data collection process. We offer suggestions to states to help them begin developing an analytical framework.

The Synthesis Report will be posted on the websites of the NSCE, Defenders of Wildlife, and the Trust for Public Land.

C. External Communications

The results of the project may be used by Defenders of Wildlife and The Trust for Public Land in conference presentations and/or journal articles. We think there are audiences that could benefit

from learning about the range of governmental and private funding sources and the relative size of their funding activities in different states. We would like to continue to advocate for development of more comprehensive databases of linked spending and spatial data that would enable many types of analysis to guide conservation work.

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Oregon State Parks and Recreation Department (OPRD) http://www.oregon.gov/OWEB/index.shtml

Oregon Watershed Enhancement Board (OWEB) http://www.oregon.gov/OWEB/index.shtml

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Massachusetts

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VI. Appendices

A. Research Contacts and Project Participants
B. Categorization of Federal Funding Programs
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Appendix A: Research Contacts and Project Participants

This appendix provides the names of the individuals in each of the study states who provided data and perspective to the project team through phone interviews, email correspondence and participation in on-line state reviews and the Conservation Finance Workshop.

Research contacts for Oregon and participants in On-line State Review:

Joshua Alpert, Trust for Public Land – Northwest

Ken Bierly, Oregon Watershed Enhancement Board (OWEB)

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Jim Myron, Oregon Parks and Recreation Department (OPRD)

Michael Pope, Oregon Department of Fish and Wildlife (ODFW)

Bruce Taylor, Defenders of Wildlife – Oregon

Sara Vickerman, Defenders of Wildlife – Oregon

Jeff Weber, Oregon Department of Land Conservation and Development (DLCD)

Research contacts for Montana and participants in On-line State Review

Jean Agapoff, Farm Service Agency

James Colgrove, Montana Fish and Wildlife Program

Jackie Corday, City of Missoula

Mike Leahy, Defenders of Wildlife - Rocky Mountain Region office

Ryan Lutey, Vital Grounds Foundation.

Glenn Marx, Montana Association of Land Trusts

Rob McCracken, Clark Fork-Pend Oreille Land Trust

Kelly Pohl, Gallatin Valley Land Trust

Robin Pruitt, Bitter Root Land Trust

Kelly Ramirez, Trust for Public Land – Montana

Joanne Rodriguez, Center for Natural Land Management

Paul Sihler, Montana Fish, Wildlife, and Parks

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Appendix B: Categorization of Federal Funding Programs

Federal programs that are coordinated by a state agency

Coastal and Estuarine Land Conservation Program (CELCP) (National Oceanic and Atmospheric Administration

Cooperative Endangered Species Conservation Fund (CESCF) Grants to States & Territories (authorized under Section 6 of the Endangered Species Act)

Forest Legacy Program (FLP)

Land and Water Conservation Fund (LWCF) State Assistance Program

National Coastal Wetlands Conservation (NCWC) grants (U.S. Fish and Wildlife Service)

Pacific Coastal Salmon Recovery Funds (PCSRF) (National Oceanic and Atmospheric Administration)

Federal programs that provide funds to conservation partners

Bonneville Power Administration (BPA) Wildlife Mitigation Program

Farm and Ranch Lands Protection Program (FRPP)

Grasslands Reserve Program (GRP)

North American Wetlands Conservation Act (NAWCA) Grants Program

Readiness and Environmental Protection Initiative (REPI) to Buffer Installation Encroachment

Wetlands Reserve Program (WRP)

Federal land management programs acquiring land that will be federally owned

National Park Service (NPS)

U.S. Bureau of Land Management (BLM)

U.S. Fish and Wildlife Service (USFWS)

U.S. Forest Service (USFS)

Appendix C: Spending and Acreage Protected in Five States by Level of Government

Summary of Land Conservation Activity (Dollars Spent and Acres Acquired), 1998-2007										
Program Type	**Oregon**		**Montana**		**Florida**		**Missouri**		**Massachusetts**	
	$ million	Acres	$ million	Acres	$ million	Acres	$ million	Acres	$ million	Acres
Federal Programs										
Coordinated thru state agency	7.0	651	48.3	$131,890	26.4	4,157	1.0	40	26.3	4,244
***Not* coordinated by a state agency**	104.8	99,613	43.5	$49,564	162.4	62,467	73.9	90,691	22.8	1,312
Land Management Agency	45.6	122,284	125.1	$190,253	112.9	94,876	43.9	31,966	19.0	5,082
Federal	$157.5	222,548	$216.9	$371,707	$301.7	161,500	$118.8	122,697	$68.2	10,638
% of Total Spending / % of Total Acres	44%	65%	60%	$0	9%	11%	60%	56%	7%	7%
State Programs										
State	$40.6	41,178	$45.8	$184,136	$2,701.2	1,235,532	$26.1	27,430	$384.8	99,826
% of Total Spending / % of Total Acres	11%	12%	13%	$0	80%	85%	13%	12%	42%	65%
Local Government Programs										
Local	$135.6	7,101	$15.3	$33,212	$354.9	50,838	$27.8	2,176	$274.6	16,007
% of Total Spending / % of Total Acres	38%	2%	4%	$0	11%	3%	14%	1%	30%	10%
Private Programs (e.g., Land Trusts, NGOs)										
Private	$24.9	73,965	$86.0	$358,079	$4.4	7,782	$25.4	68,127	$185.4	27,191
% of Total Spending / % of Total Acres	7%	21%	24%	$0	0%	1%	13%	31%	20%	18%
TOTAL	$358.6	344,791	$363.9	$947,133	$3,362.2	$1,455,652	$198.3	$220,430	$913.0	153,662

Appendix D: Recommended Attributes in GIS Shapefile Data

To conduct a spatial overlay analysis that tracks costs to acquire SWAP lands over time it is recommended that the attributes provided below be included in geo-database records. Filling in these attributes will most often require coordination between two or more divisions of an organization or agency: Geographic Information Systems and Real Estate Transaction professionals.

- Manager
- Area Name
- Close Date
- Acreage
- Total Purchase Amount
- Agency Contribution to Total Cost
- Project Partner
- Partner Contribution to Total Cost
- Purchase Type
- Funding Source
- Purpose

Appendix E: Strategic Land Protection Highlights in Five States

We provided our findings about each state in individual state reports. This section highlights specific aspects of each state's land protection efforts.

Oregon

Oregon has a couple of significant land conservation programs managed by regional and local governments. The Metro Natural Areas Program is a regional government initiative that includes residents of 3 counties and 25 cities in the Portland area. Metro's Natural Areas program invested $123 million in land protection in the region. The city of Eugene, Oregon's second largest city, formed a partnership with federal, state, and private organizations and spent $12 million on the West Eugene Wetlands. Both of these programs provided good data to the project.

Oregon has a couple of entities that were active in land conservation that we did not find in other states. These are not significant sources of new money for land conservation, but they do indicate people's willingness to use innovative mechanisms to fund land protection. The Yamhill Soil and Water Conservation District protected 1,000 acres to conserve productive soils. Oregon also has several tribal governments that are using tribal funds to protect land. The Umatilla Tribe, through its Wildhorse foundation funded by the tribe's casino operations, and the Warm Springs Tribe, are protecting resources in ceded land that the tribe used historically but that are not adjacent to the current reservation

Montana

Land conservation focuses on private lands in Montana. Montanans are fond of saying they want to keep private lands in private hands. Twenty-nine percent of the land is owned by the federal government and another 6% is held as state School Trust Land. As a result, citizens are not very eager to see more land put into state or federal ownership. Nevertheless, there is a strong conservation ethic, there is concern about the number of family ranches being sold to be divided into ranch-ettes, and there is a commitment to providing fishing and hunting access to the state's citizens and visitors. Easements meet these requirements, and Montana used easements on 77% of the acres conserved between 1998 and 2007.

Montana is a leader in defining the terms of public oversight of easements and establishing mechanisms for collecting and reporting easement data. Members of the land trust community requested a Performance Audit of Easements by the legislature (2005-2007) which concluded that easements did not decrease property tax collection because of property reclassification. The audit also linked the public investment and the expectation of public benefit to a need for increased public oversight of easement transactions. Montana law requires easements be recorded in county land records. In 2007, the state passed the Montana Land Information Act to collect digital land

information and make it commonly available. The data is recorded at the county level data and is incorporated into the state's cadastral database.

Missouri

Missouri has worked with Farm Bill programs to direct federal funds to priority areas. Missouri has the highest number of WRP-protected acres of any state in the country. The state funds staff positions to support NRCS programs and help guide Farm bill money to areas that are consistent with the wildlife strategy.

Missouri has organized around Opportunity Areas identified in the SWAP and has created coordinating groups by Opportunity Area. These coordinating groups bring together conservation partners who are working in each priority area, which has enabled the state to focus federal and private land conservation funds on priority habitats.

Massachusetts

Massachusetts has a very active private land conservation community that includes both a large number of land trusts and very well-funded NGOs, such as Mass Audubon and the Trustees of Reservations, some of which have been active since the 1800s. The Massachusetts Land Trust Coalition has 130 members that include land trusts, watershed associations, open space committees, and advocacy groups. The level of private funding in Massachusetts from 1998-2007, $185 million, dwarfs the private funding in the other study states for the same time period.

In 2000, the state established the Community Preservation Act in 2000 to create a financial incentive for local communities to raise money through a property tax surcharge to fund open space, historic preservation, and affordable housing. More than 140 communities (out of 350 cities and towns in the state) have opted in to the program which has yielded $275 million in combined local matching funding for the 3 program types.

The state maintains an open space database to gather data about land protection projects. MassGIS was established by legislation in 1999 to provide statewide coordination of GIS activity. The database is limited though by the quality of project data entered and the lack of financial data tied to transactions.

The Massachusetts Office of Energy and Environmental Affairs published the 2008 Land Protection Report, which is a good example of how reporting on progress can be done in a very compelling manner. The report focuses on state spending, with a few references to the amount of funding that was leveraged from non-state public and private sources.

Florida

Florida has had a high level of stable state funding. Florida passed its first open space bond for $200 million in 1972 and has continued this high level of state funding with the Florida Forever and

Preservation 2000 programs, each of which was funded at $300 million per year, up until 2009 (Florida Forever did not receive funding renewal this year due to lower state revenue levels). The one negative thing that could be said about this level of funding is that it hasn't increased since 1990. These programs had approved by the voters for 10-year periods, which in the past lent a high level of certainty in program funding.

Florida continues to invest in the management and analysis of land conservation information. The Florida Natural Area Inventory (FNAI) is the successor to the state's Natural Heritage Program, administered by Florida State University, and funded by state and federal contracts and grants. FNAI builds and maintains databases on biological resources in Florida. They also work with modeling tools and strategic analyses to understand the conservation challenges at a state-wide level and to look at costs and benefits associated with alternative responses. Although FNAI did not initially collect financial transactional information, it undertook this as part of this project to link spending and spatial data.

Florida employs ecological conservation science to set acquisition priorities. Despite the high levels of state funding over an extended time period, Florida has a multi-billion dollar backlog of unfunded land conservation projects. The Acquisition and Restoration Council is charged with evaluating and ranking acquisition projects on a statewide basis in a transparent forum. The ARC is made up of technically-knowledgeable people representing diverse interests, and relies heavily on scientific analyses to make decisions.

Appendix F: Descriptions of Databases Used in the Cost Analysis

Protected Areas Database of the United States (PAD-US)

PAD-US is a digital map of land stewardship boundaries that combines attributes of ownership and management and a measure of intent to manage for biodiversity. The map includes: (1) geographic boundaries of public land ownership and voluntarily provided private conservation lands; (2) land owner/manager, management designation descriptor, parcel name, and source of geographic information of each mapped land unit; (3) GAP Status Code conservation measure of each parcel based on USGS National Gap Analysis Program (GAP) protection level categories which are intended to provide a measurement of management commitment for long-term biodiversity conservation derived from land management plans or land manager interviews; and (4) IUCN category for a protected area's inclusion into UNEP-World Conservation Monitoring Centre's World Database for Protected Areas. We considered lands with a GAP status from 1 to 3 to be already protected and did not include in these in the cost analysis, and we considered lands with a GAP status of 4 to 5 or lands not included in the PAD-US database to be unprotected.

Florida Managed Areas (FLMA)

The FLMA database is maintained by the Florida Natural Areas Inventory (FNAI) and includes the boundaries and statistics for more than 1,900 federal, state, local, and private managed areas, with all the data provided directly by the managing agencies. National parks, state forests, wildlife management areas, local and private preserves are examples of the managed areas included. The managed areas shapefile is updated quarterly.

The National Land Cover Database 2001 (NLCD 2001)

The National Land Cover Database 2001 (NLCD 2001) has been compiled across all 50 states and Puerto Rico as a cooperative mapping effort of the Multi-Resolution Land Characteristics 2001 Consortium. This land cover database was created using mapping zones and contains 28 standardized land cover types. The database calculates total acreage of forest, shrub, grassland, cropland, pastureland, and wetlands.

The Habitat and Landcover Database (GFCHAB_03)

The Habitat and Landcover database (GFCHAB_03) was published in 2004. This dataset contains plant community and land cover data for the state of Florida derived from Landsat Enhanced Thematic Mapper Satellite imagery from 2003. The database calculates total acreage of forests, wetlands, cropland, pastureland, citrus, grassland/shrub land, and mangrove forests.

The Lulc05 Database

The Lulc05 database was created by the Missouri Resource Assessment Partnership in 2005. The land cover classification is based on 2000-2004 satellite imagery. Ancillary data for stream networks, the National Wetlands Inventory, and the Wetlands Restoration Programs lands were used in a post hoc fashion to improve the mapping of open water, woody-dominated wetland, and herbaceous-dominated wetland. The database calculates total acreage of cropland/pastureland, grassland, forest, wetland, and woody/herbaceous.