WRI ISSUE BRIEF

Southern Forests for the Future Incentives Series *Issue Brief 3*

WORLD RESOURCES INSTITUTE

Forests at Work: A New Model for Local Land Protection

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SUMMARY

- To date, traditional public land acquisition programs have played a relatively small role in the conservation and sustainable management of southern U.S. forests. The South trails behind other U.S. regions in both the percent of the land base and the acres per capita conserved in parks, wildlife refuges, wilderness, and other protective categories.
- Working forests offer a new model for scaling up the amount of publicly protected forestland in the South. "Working forests" are defined as forests that are actively managed to generate revenue from multiple sources, including sustainably produced timber and other ecosystem services, and thus are not converted to other land uses such as residential development.
- A public entity can "acquire" a working forest in two ways. It can purchase all of the property rights associated with a forest through a fee simple, or outright, purchase of the land from willing sellers. Alternatively, a public entity can purchase just the development rights to the forest through a conservation easement, leaving ownership of all the other rights in the hands of private landowners. This brief uses the term "acquire" to cover both fee simple and conservation easement purchases.
- Public entities can finance working forests via public bonds, sales taxes, or other means. In return, revenues from working forests can be used to offset acquisition costs over time, cover stewardship expenses, and/or pay taxpayers "dividends" in the form of tax rebates or some other equitable revenue sharing scheme after expenses are covered.
- Citizen advisory boards could shoulder much of the administrative and management responsibility for the working forest, thereby keeping management and financing local.
- Revenues from timber, recreation, and other ecosystem service payments, increases in tax revenue due to higher surrounding property values, and avoided development costs are among the economic benefits generated by working forests.
- Scaling up working forests in the South would necessitate further documentation of the economic benefits of the model relative to traditional acquisition programs, broadening the scale and scope of available financing options, offering favorable tax benefits, and educating woodland owners about the benefits of working forests.
- This issue brief is intended as a resource primarily for local public officials in the southern United States who are interested in a more cost-effective approach to acquiring and managing public forestland. It provides readers with several economic scenarios that examine the community benefits of a working forest model and discusses the opportunities for scaling up the model in the region.

A New Approach to Public Forest Protection

As described in *Southern Forests for the Future* (Hanson et al. 2010), the forests of the southern United States face a number of threats to their extent and health, including permanent conversion of forests to suburban development and strip mining. One approach among many for addressing these challenges is to conserve southern forests by placing tracts into the public domain as national forests, parks, wildlife refuges, state forests, or other types of protected landscapes. However, publicly owned forests in southern states currently comprise just 13 percent of the region's total forest estate (Hanson et al. 2010). Although state and local public land acquisition programs have gained traction nationwide, in the South their success has been limited by a number of factors discussed in this issue brief.

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MARCH 2011
Printed on recycled paper

How can public stewardship of forests gain more traction in the southern United States? Pursuing a "working forest acquisition" model is one possible approach. This model differs from traditional public land acquisition programs in that with the former the forest is "put to work," earning revenues from one or more ecosystem service market opportunities, such as sustainable timber production, recreation and hunting fees, and, to the extent management activities enhance environmental quality, payments for carbon sequestration, endangered species habitat, and/or water quality. For example, establishing protected areas is one way county governments could earn "avoided deforestation" credits in emerging carbon markets.[1]

A public entity can "acquire" a working forest in two ways. It can purchase all of the property rights associated with a forest through a fee simple, or outright, purchase of the land from willing sellers. Alternatively, a public entity can purchase just the development rights to the forest through a conservation easement, leaving ownership of all the other rights in the hands of private landowners. This brief uses the term "acquire" to cover both fee simple and conservation easement purchases.

For forests acquired through fee simple, or outright, purchases, a local government could rely on citizen advisory boards to make management decisions. Revenues generated by the working forest once the land is acquired could be paid back to taxpayers or retained by the advisory board to fund restoration activities.

As with traditional land acquisitions, working forest acquisitions can be financed through public bonds, taxes, or other local financing options. How the funds are used, how the forest is managed, and how the acquisition expenses are repaid make the working forest acquisition model unique. As part of the World Resource Institute's (WRI) *Southern Forest for the Future Incentives Series* (Box 1), this brief explores the working forest model and how it overcomes existing barriers to traditional public land acquisition approaches in the South.

Publicly Protected Areas Are Popular in the United States…

Establishing publicly protected areas has been a traditional approach for maintaining the ability of forests to provide a range of ecosystem services, particularly regulating services and cultural services.[2] "Protected areas" are clearly defined geographical regions that are recognized, dedicated, and managed by legal or other effective means to achieve the long-term conservation of nature and associated ecosystem services (Dudley 2008). Protected areas have some form of permanent designation that prevents the natural ecosystem from being converted to some other use—such as residential development—and prescribes how the ecosystem should be managed.

The southern United States currently contains approximately 39.5 million acres of protected areas—many of them forested—distributed throughout the region (Figure 1). The majority of

Box 1 About the Southern Forests for the Future Incentives Series

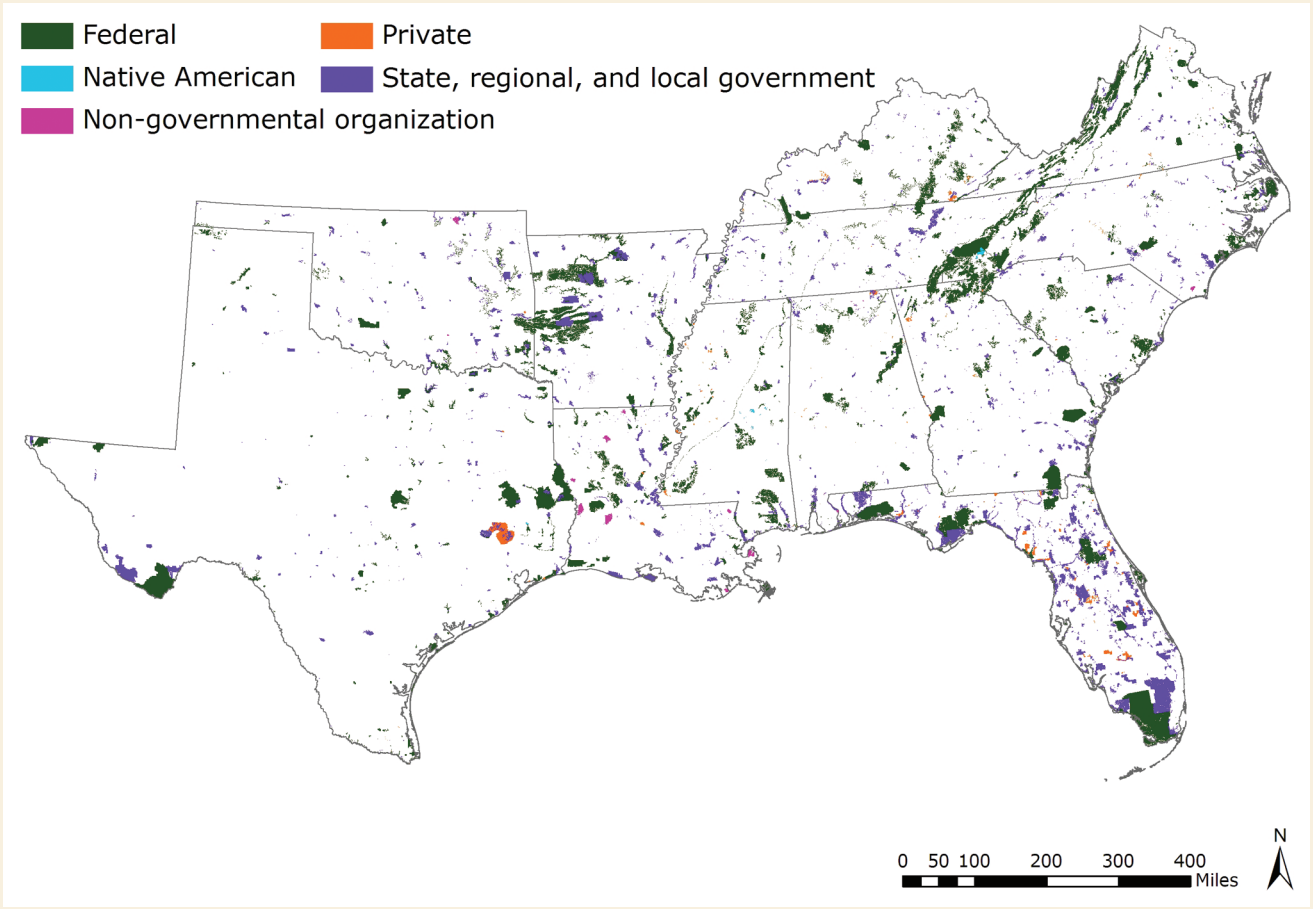
Over the coming decades, several direct drivers of change are expected to affect the forests of the southern United States and their ability to provide ecosystem services. These direct drivers include suburban encroachment, unsustainable forest management practices, climate change, surface mining, pest and pathogen outbreaks, invasive species, and wildfire. In light of these drivers of change, what types of incentives, markets, and practices—collectively called "measures"—could help ensure that southern U.S. forests continue to supply needed ecosystem services and the native biodiversity that underpins these services? The *Southern Forests for the Future Incentives Series* explores several such measures.

The series follows the U.S. Forest Service convention of defining "the South" as the states of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia. Furthermore, the series is premised on the fact that southern U.S. forests provide a wide variety of benefits or ecosystem services to people, communities, and businesses. For example, these forests filter water, control soil erosion, help regulate climate by sequestering carbon, and offer outdoor recreation opportunities.

This series follows and builds upon *Southern Forests for the Future*, a publication that profiles the forests of the southern United States, providing data, maps, and other information about their distribution and make-up, condition, and trends. It explores questions such as: Why are southern forests important? What is their history? What factors are likely to impact the quantity and quality of these forests going forward? The publication also outlines a wide variety of measures for conserving and sustainably managing these forests. The *Southern Forests for the Future Incentives Series* delves deeper into some of these measures.

For additional information about southern U.S. forests, visit **www.SeeSouthernForests.org.** Developed by WRI, this interactive site provides a wide range of information about southern forests, including current and historic satellite images that allow users to zoom in on areas of interest, overlay maps showing selected forest features and drivers of change, historic forest photos, and case studies of innovative approaches for sustaining forests in the region.

FIGURE 1 Protected Areas in the South (2009)



Source: Protected areas (PAD-US, U.S. Geological Survey National Gap Analysis Program, 2009), administrative boundaries (ESRI 2008).

the publicly protected areas in the South are federally owned, while the rest are managed by state and local governments. In particular, the federal government manages approximately 29.8 million acres, including 12.9 million acres of national forests, 5.4 million acres of national parks, and 3.8 million acres of wildlife refuges. The 13 southern states combined manage approximately 3.6 million acres of state forests and 1.7 million acres of state parks (Hanson et al. 2010).

Protected areas typically limit revenue-generating land uses by, for instance, prohibiting commercial timber sales or mining in park or open-space boundaries, although some revenue options, like recreation, remain. Establishing publicly owned protected areas therefore requires upfront financing to purchase or to establish conservation easements[3] on the land. Financing can be done through a variety of approaches. For instance, governments can utilize funds from annual appropriations or from dedicated government revenue streams. An example of the latter is the U.S. Land and Water Conservation Fund, which finances the creation and expansion of parks, open spaces, wildlife refuges, and other natural areas via a royalty on offshore oil and gas extraction (Walls 2009). Another approach that has become increasingly popular across the United States is the ballot initiative, wherein citizens vote on and approve conservation-oriented bonds or taxes at the local or state level. Between 2000 and 2010, voters across the United States approved more than $38 billion in conservation funds to finance the protection of forests and other open spaces (The Trust for Public Land 2011a).

State and county polls indicate strong enthusiasm in the South for public funding for conservation. For example:

- In Alabama, 80 percent of respondents in a 2009 survey said they would vote "yes" to an amendment to the Alabama Constitution for the continuation of the "Alabama Forever Wild" program to acquire, maintain, and protect land and water resources. Moreover, 41 percent of respondents believed the state should commit even more funding to protect natural areas, wildlife habitat, and water supplies (The Trust for Public Land 2009a).
- In Florida, 76 percent of voters in a 2009 survey supported continuing the "Florida Forever" program at the same level of funding as in the past (The Trust for Public Land 2009b).
- In North Carolina, 76 percent of voters in a 2009 poll agreed that, despite declining state revenues, the North Carolina state budget should include funding for land and water conservation (The Trust for Public Land 2009c).
- In polls of seven[4] Southern counties, 61 percent of citizens, on average, supported bond measures to raise funds for land conservation in their respective counties, especially when aimed at protecting water quality and drinking water sources (The Trust for Public Land 2003-2008).

National polls also underscore that American voters are committed to public financing of land and water conservation. A 2009 national poll found that three out of four voters surveyed believed that land and water could be protected while still maintaining a strong economy (The Nature Conservancy 2009). Three in five of the surveyed voters supported an increase in public investments in ecosystem conservation at the federal, state, or local levels and were willing to pay a small increase in taxes to support these investments. Nearly three in five voters polled in 2004 and 2009 were willing to pay $100 per year in increased taxes to finance conservation (The Nature Conservancy 2009). These polls also show that commitment appears not to have wavered despite the recent economic downturn.

...But the South Trails Behind in Financing and Number and Size of Protected Areas

Despite the public support indicated by surveys, the number and size of publicly protected areas and public financing for them are disproportionately low in the South relative to the entire United States. For example:

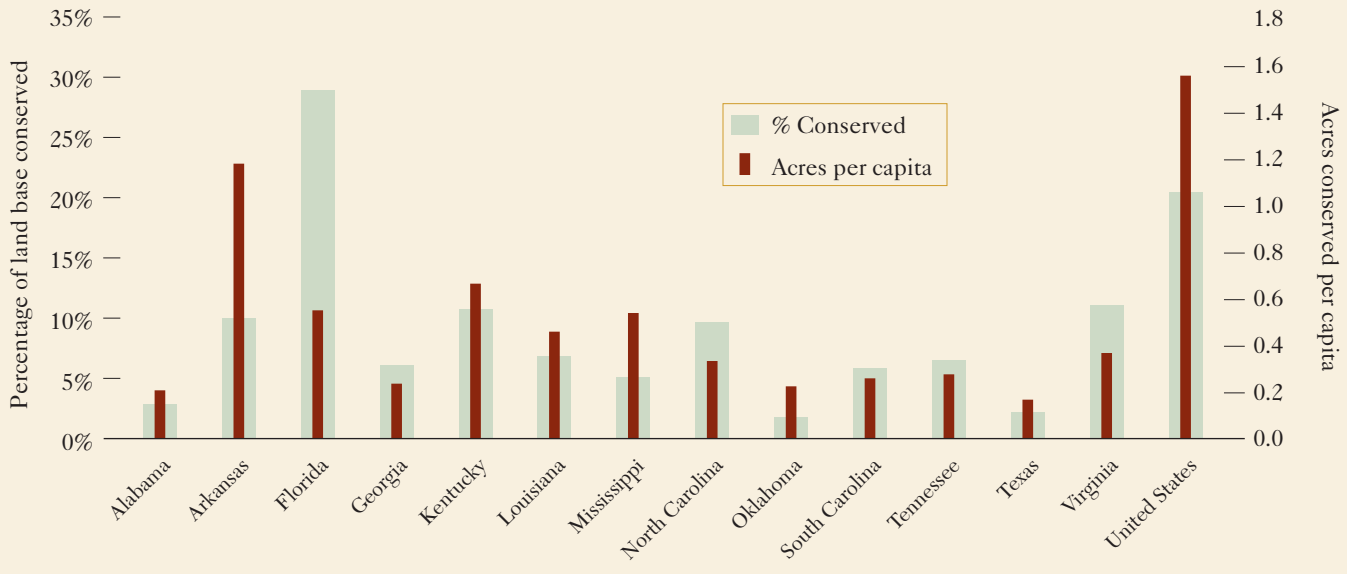
- Although the 13 southern states comprise approximately 24 percent of the total U.S. land base (ESRI 2008), the South has just 5.5 percent of the total publicly owned protected areas in the United States by acreage (U.S. Geological Survey 2009).
- Nearly all southern states are below the national average with regard to the share of the states' land base that is conserved and with regard to the amount of land conserved per capita (Figure 2). Among southern states, only Florida has a greater share of land conserved than the national average and only Arkansas approaches the national average in terms of conservation acres per capita.
- Whereas approximately 44 percent of all U.S. forests are publicly held,[5] just 13 percent of southern forests are owned by public entities (Smith et al. 2009).
- The 13 southern states passed 182 of the nation's 1,169 conservation ballot initiatives since 2000, only 16 percent of the nation's total (The Trust for Public Land 2011a), although the South holds nearly one third of the nation's population (U.S. Census Bureau 2005).

Why is this? Lack of funds to acquire forestlands is an issue, but all regions of the country likely face this problem. Several other factors seem to underlie the lower rates of publicly owned protected areas and public financing of protected areas in the South. First among these factors is history. By the time of the rise of the conservation movement, around the turn of the 20th Century, most of the East was already settled and claimed by private landowners. The western United States, in contrast, was less densely populated, and the government—particularly the federal government—still owned a sizable share of the land there. To this day, federal land ownership remains higher in the West than in the East.

Second, once land is purchased by a public entity for the purpose of conservation, the tract is typically considered removed from property tax rolls.[6] The tract thus no longer generates tax revenues that can be used for schools, emergency response units, recreation facilities, or other public services. Such consequences can create a disincentive for local and state governments to acquire forests and other lands for conservation.

Third, throughout the South, it is widely understood that many southern forests need active management to remain healthy (Cassidy 2005). Regional programs to reduce wildfire risk, contain pests and pathogens such as the southern pine beetle, and restore longleaf pine communities require a variety of management techniques, such as thinning, prescribed burning, and replanting of native species (Nowak et al. 2008; America's Longleaf 2009; Agee 1997). Traditional acquisitions—such as for state or county parks—may not be compatible with the need for these intensive restoration activities. Moreover, the public

FIGURE 2 **The South Lags Behind in Percent of Land Base and Acres Per Capita Conserved**



Source: Trust for Public Land, Conservation Almanac (2010).

may perceive traditional forest acquisitions as being "locked up" and not eligible for these beneficial management activities.

Fourth, for the past several decades, southern states have experienced dramatic growth in population, housing, and jobs relative to northern states, a phenomenon that has been referred to as the "sunbelt" effect (Glaeser and Tobio 2007). While it is unclear whether a milder climate or other factors have made sunbelt communities more attractive, these migration and relocation trends have put pressure on southern communities to accommodate new growth by opening up previously undeveloped forested areas (Hanson et al. 2010).

Finally, land in the public domain requires state and local land management capacity, but state and local government budgets in the South are already strained. Adding more land to the protected land base would entail additional staff, such as natural resource managers and planning staff (Ellefson et al. 2004).

The Working Forest Acquisition Model Is a Potential Alternative

The working forest acquisition model is one possible approach to overcoming these barriers to growth in publicly owned protected forests. "Working forests" are here defined as forests that are actively yet sustainably managed to generate revenue from multiple sources, but are not converted to other land uses such as residential development. Potential revenue sources include sustainably harvested wood products, non-timber forest products such as wild foods, recreation and hunting fees, and credits for carbon, endangered species habitat, and water quality, among others.

Earning revenues from many of these ecosystem service markets (e.g., carbon, water quality and/or quantity, habitat) is a new opportunity that would be possible only if management activities result in measurable environmental quality improvements (e.g., reduced nutrient pollution) over previous management trends. For example, carbon credits could be earned only if there were a high likelihood that the acquired forest parcel would be developed. If this could be demonstrated, the owner could be eligible to earn "avoided deforestation" carbon credits, assuming such programs were established in the relevant state.[7] Utilizing working forests to benefit forest ecosystem health is an idea that is beginning to gain momentum (Box 2).

Under a working forest acquisition model, a public entity "acquires" a tract of forest in one of two ways. It can conduct a "fee simple" or outright purchase of the forest, and thus gain ownership of all the property rights associated with the tract. Alternatively, the entity can finance a working forest conservation easement that prevents conversion of the forest to other land uses by acquiring the development rights, while ownership of the remaining property rights stays with a private individual,

Box 2 Working Forests in Focus

The Nature Conservancy's Working Woodlands Program

Working Woodlands is a program being designed and implemented by The Nature Conservancy (TNC) in Pennsylvania wherein TNC secures long-term, non-development agreements from landowners that entail no out-of-pocket costs to the landowner. In exchange, TNC provides a full forest and carbon inventory, a 10-year forest management plan, enrollment in Forest Stewardship Council (FSC) certification, 100 percent of all Forest Stewardship Council (FSC) certified timber and wood biomass revenues, access to carbon markets, and the majority share of forest carbon revenues. TNC covers the costs of providing these services by retaining a portion of the carbon revenues.

Community Forestry Bonds for Working Forests

The Community Forestry Conservation Act of 2009 (CFCA) would authorize Community Forestry Bonds to be used as a new financial tool for qualified entities to acquire working forests and develop management plans, while providing jobs and respecting nearby landowners' property rights. In this model, tax-exempt, low-cost revenue bonds would be issued by the government to allow qualified buyers to acquire forestland in fee simple. These bonds would be revenue bonds, which would be backed by the revenue streams generated by the low-impact management of the land. These bonds would allow qualified buyers, including conservation organizations, businesses, and other interested parties, to borrow hundreds of millions of dollars in a more timely and efficient manner.

Once the qualified buyer holds the title to the land, it would be managed to service the tax-exempt debt in a manner that would comply with the management plan. This approach allows a qualified buyer to borrow money at a lower cost in exchange for providing increased public benefits. The qualified buyer would have greater access to capital and be able to borrow at a lower cost, which would eliminate competition with private sector buyers, because the qualified buyer would be able to compete with acquisition costs and would not have the same requirements as traditional commercial returns. After the bond is paid off, the buyer would retain ownership and be able to continue to operate the working forest to generate revenues for a variety of different community or conservation projects.

family, or company. Either can be financed by revenue raised via public bonds, sales taxes, or other means.

Revenues generated by the working forest are used to offset the acquisition cost over time, pay for ongoing management costs, and/or pay taxpayers "dividends" in the form of property tax rebates should excess revenues be earned. The model also could include citizen advisory boards, which could shoulder much of the administrative and management responsibility of the working forest and keep the forest locally managed.

The working forest model can complement traditional public conservation approaches in many ways, for instance:

- Working forests are consistent with widely held values in the South that land should be used in productive ways (Cassidy 2005). Instead of acquiring forests and placing them in park status, management activities are diversified across a broad range of revenue-producing activities that are based on ecosystem services.
- Working forests can be viewed as investments rather than simply debt for public entities and citizens. If the forest land is managed effectively to maximize ecosystem service revenues, in some situations it might pay for itself over time and rebate money to taxpayers as a return on this investment. At the very least, public entities using this model can pay back debt more quickly than entities using models that do not manage for ecosystem services.
- Protected forests, wildlife areas, and natural lands support recreational activities such as camping, hunting, fishing, and wildlife viewing that bring dollars into local economies.[8] For example, a 2006 report for the National Parks Conservation Association showed that for every $1 appropriated in the annual national parks budget, the national park system generates at least $4 for state and local economies.[9]
- Conservation can serve as a money-saving alternative to some types of development, although results differ from community to community. Cost of community services (COCS) studies have shown that for residential development in particular, communities may actually spend more in infrastructure expenses than they stand to gain in property taxes and in the long-term, conserving land may make more economic sense.[10]
- Management by citizen "shareholders" could create incentives to develop and participate in ecosystem service market opportunities.
- In lieu of additional salaried natural resource management staff, citizen management boards could help alleviate fiscal and human resource constraints on traditional federal, state, and local natural resource management agencies.

Overcoming the Obstacles

The working forest acquisition model has several features that could help it overcome some of the obstacles faced when trying to establish more traditional publicly owned protected areas. The following financial analysis discusses the benefits of a working forest model relative to the traditional forest acquisition model once decision-makers have already made the decision to add lands to the protected land base.

Economic benefits to counties

The net fiscal impacts of acquiring a working forest via fee simple or a conservation easement can be less than those of more traditional publicly owned protected areas. The revenues earned by working forests can match or exceed losses of revenues associated with taking these lands out of the property tax base and can help cover the costs of ongoing management activities. There are other economic benefits to consider, as well. Establishment of protected areas helps boost property values, and thereby property taxes, on nearby land (De Brun 2007). Protecting forests also helps local governments avoid the costs of public infrastructure and community services relative to what would be incurred if the land were developed. Coupled with revenues earned, these benefits can transform a net-loss traditional acquisition into one that pays for itself — or nearly pays for itself — from the taxpayer perspective.

Table 1 summarizes a financial analysis of how the working forest model can improve upon the economics of traditional public land acquisitions. Four scenarios are presented, and all are based on an actual acquisition by a county government in central North Carolina and, where available, local tax, forest revenue, and land cost data. Where data were missing, figures were drawn from studies in other relevant regions.

Scenario 1: Traditional public forest acquisition

In this scenario, a county government purchases a 562 acre site for $11.8 million, or $20,996 per acre. Half the site is forested and the other half is open agricultural land. The high value reflects the fact that the parcel is in a rapidly developing area. The purchase was made to protect open space, with no immediate plans for active forest management or participation in ecosystem service markets. The purchase was financed with bonds with 20-year terms at a tax-exempt interest rate of 3.5 percent, which translates into an acquisition cost of $830,257 per year. COCS studies relevant to North Carolina estimate the annual costs of fire protection, maintaining access, and other management activities to be $29,336 per year for this acreage of open space (Farmland Information Center 2007). Forgone tax revenues the county would have received if the parcel were developed are then added to these costs. Assuming a density of one unit per acre, a median property value of $235,000 after development, and the current county tax rate of $0.614 per $100 of assessed value, the forgone annual tax revenues (property and fire protection taxes) are $810,910. Thus, the total annual economic cost of the forest acquisition is $1,670,502.

Against these costs, there are three main categories of benefit. First, protecting open space has a beneficial effect on property tax collections by increasing the assessed value of adjacent properties (De Brun 2007). Assuming that developed properties bordering the newly acquired open space enjoy a 10 percent increase in value translates into $81,091 of additional property tax revenues for the county.[11]

Second, the county avoids having to pay for infrastructure associated with new subdivisions. These avoided costs are substantial. Public infrastructure costs, which include the costs county governments pay for schools, sewer lines, utility lines, roads, bridges, and stormwater controls, can be as high as $69,500 per unit (Village Project 2001). However, in most jurisdictions, a significant portion of these costs is charged to developers. To be conservative, the analysis assumes that the public share is $5,000 per unit. Multiplied by the number of units at one per acre (562) and then annualized over a 20 year period yields an avoided annual infrastructure cost of $265,244.

Third, in addition to these infrastructure costs, there are annual costs associated with community services such as fire, police, schools, road maintenance, and sanitation. Using COCS studies relevant to North Carolina, the analysis estimates these to be $1.35 for every dollar of tax revenue the county would have collected ($810,909 *1.35=$1,094,727) if the parcel were developed (Farmland Information Center 2007). Thus, total annual benefits are $1,441,063 (additional taxes: $81,091 + avoided infrastructure: $265,244 + avoided COCS: $1,094,728).

Using a discount rate of 3.5 percent, the 20 year cost stream has a present value of $23.74 million. The benefit stream has a present value of $20.48 million. The county thus incurs a net present value acquisition cost of $3.26 million. In purely financial terms, the acquisition has a benefit-cost ratio of 0.86, meaning that the discounted stream of benefits is slightly less than costs. It is important to note, however, that this analysis does not include many non-market benefits associated with recreation, water quality, biological diversity, flood control, and others provided by the conserved forest tract. If these benefits

were incorporated, the benefit-cost ratio closer would likely increase to closer to 1.0.

Scenario 2: Working forest acquisition with revenue from ecosystem markets

Applying the working forest scenario opens up multiple possible revenue streams to help cover management costs and improve the overall economic impact of the acquisition. Three are modeled here. These include revenues from sustainably harvested timber, the sale of carbon credits, and recreation. Potential timber yield was estimated using timber harvest data from North Carolina and a timber harvest model for loblolly pine developed by the University of Tennessee (Clatterbuck and Ganus 1999; Brown and New 2006). An annualized harvest value of $50 per acre was assumed. The analysis assumes two sources for carbon credits – afforestation and improved forest management. Afforestation on 80 percent of the acquisition's pasturelands was assumed to generate five carbon credits (metric tonnes of carbon dioxide [CO_2]) per acre per year. Improved forest management on the parcel's forested acres was assumed to generate two credits per acre per year. We also assumed an average carbon dioxide price of $20 per credit over the next 20 years.[12] Recreation fees – in the form of hunting leases and revenues from two or three developed camping sites – were assumed to generate $15 per acre per year over and above management costs averaged across the entire acquisition.[13]

As shown in Table 1, making conservative assumptions about these annual revenue streams improves the project's net present value over the 20-year analysis period by $958,485 and the benefit-cost ratio to 0.90. As before, adding in other non-market benefits, such as those related to water quality, could cause the acquisition to enjoy a benefit-cost ratio well above 1.0.

Scenario 3: Working forest acquisition in an area with less development pressure

One of the challenges to making working forest acquisition programs pay for themselves is the high cost of land in rapidly developing areas. In Scenario 1, based on actual purchase data, raw land values exceeded $20,000 per acre, leading to a high annualized cost of servicing the bonds used to pay for the acquisition. From a purely financial standpoint, working forest models have a higher chance of generating positive net present values (and not just reducing net losses associated with traditional acquisitions) if they are located in areas where development pressure is not as great because acquisition costs would be much lower. Moreover, working forests in these areas are far less likely to generate noise, visual, and safety concerns—associated with timber extraction—for nearby landowners.

However, working forest acquisitions do not make much sense from a conservation perspective if they are located too far from developing areas, where conversion pressure is low and public uses are low as well. So a useful analysis would be to consider the economics of the working forest model in the transition zone, where development pressure is just starting to exert its influence. To capture this, the analysis includes a third scenario, where the costs of acquisition are $13,000 per acre and surrounding homesites have an assessed value of $150,000.

Under this scenario, the annual costs of debt service on the acquisition bonds drops to $511,737. Annual management costs drop to $18,082, reflecting the lower cost of management (i.e., for recreation and for fire suppression) in less utilized areas. Lower property values reduce forgone tax revenues from development to $517,602. Timber, carbon, and recreation revenues remain unchanged. Because of lower property values, the property tax gain on surrounding lands is less, as are the avoided costs. The former drops to $51,760, the latter to $964,007. Taken together, the acquisition generates a positive net present value of $508,614 and a benefit-cost ratio of 1.03. Thus, from a financial standpoint, this working forest scenario more than pays for itself. As before, adding non-market benefits to the analysis would make the acquisition even more attractive.

Scenario 4: Working forest acquisition obtained through a conservation easement rather than outright purchase

Another factor that may enhance economic feasibility is for the public entity to establish the working forest by purchasing a conservation easement instead of conducting a fee simple acquisition. Through a conservation easement purchase, a county government does not obtain title to the land, but instead, purchases and retires the development rights for that land. The woodland owners, who must manage the land in accordance with the terms of the easement, retains ownership. Terms of the easement are negotiated on a case-by-case basis, but for a working forest would usually include rights of the public agency purchaser to manage forests for ecosystem service market revenues, such as carbon, timber, and recreation. Typically, acquisition costs for easements are from 40 to 60 percent of the fair market value of the land.[14] Because ownership of the remaining property rights does not change, public entities are still able to collect property tax revenues, albeit at a reduced rate since the land can no longer be developed.

In Table 1, Scenario 4 illustrates the impacts of a conservation easement rather than fee simple purchase for our example. Relative to Scenario 3, annual debt service payments drop to $255,868, forgone tax revenues are somewhat reduced, to $462,602, because the county still collects revenues for the parcels (albeit for current forestry uses), and avoided cost benefits diminish somewhat, to $889,756, because not all development is precluded by the conservation easement. The easement scenario yields a net present value of $3,871,530, and a benefit-cost ratio of 1.37.

In summary, working forests can be located to maximize the avoided costs of new development and the gain in property taxes from nearby lands that benefit from a protected area established in close proximity. Managing for timber, carbon, recreation and other ecosystem service revenues can, at a minimum, help cover the costs of ongoing management and pay for restoration activities. Feasibility of the approach improves further if working forests are located in newly developing areas, where land values are not as high. Utilizing conservation easements rather than fee simple purchases greatly reduces debt service payments and retains at least a modest stream of property tax revenues for the county.

Figure 3 shows the relative economics of these scenarios in terms of net financial benefit to the public entity. Per dollar spent, scenario 1 ultimately costs just 14 cents and scenario 2 costs 10 cents. Scenarios 3 and 4 actually generate a positive return per dollar spent.

Giving taxpayers a stake in management

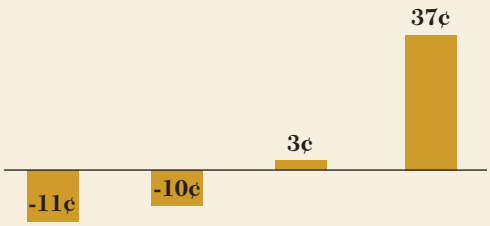
Since the initial establishment of a working forest under this model relies on public financing, one way to solidify and scale up public support is to give taxpayers a stake in the forest's earnings by returning revenues net of stewardship expenses back to the citizens who financed the acquisition or use funds to implement beneficial restoration activities. For example, annual revenues from timber, carbon, and recreation and property tax gains over and above management costs in Scenario 2 ($119,195) could be returned to taxpayers as "dividends" on their investment through tax rebates or some other equitable revenue-sharing scheme. Or these dollars could be used to generate more ecosystem service credits by planting forest buffers along streams or creating wetlands that earn nutrient-reduction credit revenues in water quality trading markets, for example. In this manner, public funds spent on a forest acquisition are transformed from a onetime lump

Table 1 **Impact Working Forest Models Improve the Economics of Acquisitions**
(Hypothetical analysis of a 562-acre acquisition in central North Carolina)

	Traditional Fee Simple Acquisition (Scenario 1)	Working Forest (Scenario 2) Ecosystem Markets	Working Forest (Scenario 3) Locate Further Out	Working Forest (Scenario 4) Easement
Annual costs and expenditures				
Debt service	$830,257	$830,257	$511,737	$255,868
Management costs	$29,336	$29,336	$18,082	$18,082
Foregone tax revenues	$810,910	$810,910	$517,602	$462,602
Total annual costs	**$1,670,503**	**$1,670,503**	**$1,047,421**	**$736,552**
Annual benefits and revenues				
Timber sales	$0	$25,290	$25,290	$25,290
Carbon credits	$0	$33,720	$33,720	$33,720
Hunting and recreation fees	$0	$8,430	$8,430	$8,430
Property tax enhancement	$81,091	$81,091	$51,760	$51,760
Avoided development costs	$1,359,972	$1,359,972	$964,007	$889,756
Total annual benefits	**$1,441,063**	**$1,508,503**	**$1,083,207**	**$1,008,956**
Present value costs (20 years)	$23,741,855	$23,741,855	$14,886,361	$10,468,174
Present value benefits (20 years)	$20,480,973	$21,439,458	$15,394,975	$14,339,704
Net present value	-$3,260,882	-$2,302,397	$508,614	$3,871,530
Benefit-cost ratio	0.86	0.90	1.03	1.37

Source: World Resources Institute, 2011

FIGURE 3 **Net Financial Benefit Per Dollar Spent**



Scenario	1	2	3	4
Key features	Non-working forest, fee simple	Working forest, fee simple	Working forest, fee simple, further from suburbia	Working forest, easement, further from suburbia

Note: Figures will vary by tract of land.
Source: World Resources Institute, 2011.

sum expenditure into a long-term public investment, from the taxpayers' perspective.

Though revenue sharing from working forests is a new innovation, models exist of public revenue sharing from natural resource utilization and can help inform a working forest acquisition program's design. One such example is the Alaska Permanent Fund. A 1976 amendment to Alaska's constitution requires that "[at] least twenty-five per cent of all mineral lease rentals, royalties, royalty sales proceeds, federal mineral revenue sharing payments and bonuses received by the State shall be placed in a permanent fund, the principal of which shall be used only for those income-producing investments specifically designated by law as eligible for permanent fund investments."[15] Realized income earned from the fund's investments is accounted for in the earnings reserve account by state law. On June 30 of each year, the legislature appropriates funds from the account in part to pay dividends to all Alaska residents. Since 1982, annual dividend payments have varied between $329 and $2,069,[16] with the average being $1,104.

By establishing citizens as shareholders, the working forest model is likely to garner more community support for the kinds of active management techniques needed to maintain a healthy forest, such as thinning to combat the southern pine beetle, conducting prescribed burns to reduce wildfire risk, and reforesting to restore healthy stand conditions. This is because the "asset value" of the working forest is protected and enhanced by these activities.

Not "locked up"

Under the working forest model, the forest is not "locked up," or unavailable for productive use. Rather, the forest is managed for a suite of revenues, from sustainable timber and other ecosystem services. To the degree that attitudes toward working farms and ranches are transferable to forests, the model could garner broad public support, as noted by Metz (2009):

> "…working farms and ranches continue to be a high priority for conservation. Focus group respondents placed a great deal of value on preserving small family farms and ranches. The word 'working' evokes those types of lands, and conveys that the land is productive and being used."

Local management

Under the working forest model, citizen advisory boards could provide administrative oversight to the selection of forest tracts and overall forest management. Of course, counties could retain management responsibility themselves, but the phenomenon of quasi-public management entities offers several advantages.

Responsibilities of a stakeholder/citizen-led management team include ensuring that a sustainable forest management plan is in place, monitoring performance, and determining the allocation of the forest's revenue streams. The board could select forest tracts for conservation. There are several options for board selection. One model is to have an appointed forest advisor who is held accountable by a citizen advisory board, and another is to have a board that is elected every 4 years, similar to a school board. Representatives on the board could include local landowners, conservation organizations, forestry professionals, and others.

Having citizen advisory boards can confer at least two benefits. First, it can strengthen the tie between a community and forests in its region. Second, it sends a clear signal that working forests are managed locally and not managed by a perceived "distant bureaucracy" in a state capital or in Washington, D.C.

A developed example of this kind of management delegation is found in quasi-public watershed councils and associations. These councils provide coordination for agencies that would otherwise be managing watersheds from different, sometimes conflicting, regulatory standpoints. Oregon's watershed councils, for example, bring together stakeholders from private, local, state, and federal sectors to agree on goals, plan watershed protection and restoration strategies, and foster communication between stakeholders. Watershed plans are holistic, from ridge top to ridge top and from headwaters to mouth.[17] The

Rhode Island Rivers Council and a network of local watershed councils are designed to alleviate the fragmented and often conflicting nature of watershed regulation among multiple state agencies.[1]

While the role of citizen advisory boards for fee simple acquisitions is relatively easy to conceptualize, the situation may be a bit more complicated for lands acquired through easements. For these lands, the precise nature of the management structure would have to be worked out in the context of the covenant agreement.

Local capacity

The working forest model can help alleviate the fiscal and human resource burdens associated with more traditional public ownership (Ellefson et al. 2004). In cases where a public entity takes ownership of a working forest, the citizen advisory board provides oversight. Furthermore, income from ecosystem service revenue streams can help finance best management practices and technical assistance. In cases where a public entity purchases a working forest easement, the private landowner retains ownership of the property (but not the underlying development rights) and management (according to the clauses in the easement) of the land.

Scaling Up In the South

Widespread application of the working forest acquisition model in the South would require state and local public agencies to commit to programs to enhance both the demand for and the supply of working forest landscapes.

On the demand side, a first step would be for counties and municipalities seeking to establish parks or protect open space from development to analyze the economic benefits associated with working forests relative to other forms of protection. As this brief demonstrates, working forests have the potential to provide counties and municipalities with positive economic returns in the form of revenues from timber, carbon sequestration, and recreation, increases in property tax collections, and avoided infrastructure and public service costs. Documenting the magnitude of these positive economic impacts would go a long way toward making working forests a politically attractive form of public forest conservation.

A second step would be to expand the range of funding tools available to establish working forests through fee simple purchases or conservation easements. Nongame tax check offs, local acquisition bond measures, and environmental license fees are the most ubiquitous funding sources in the South (The Nature Conservancy 2004; The Trust for Public Land 2010), but there are many other options that have yet to be tried in most jurisdictions. Many of these options have been tried in only one or two states. For example, property tax ballot initiatives have successfully passed in only 2 of the 13 states—Florida and Louisiana (The Trust for Public Land 2010). Although conservation finance mechanisms are beyond the scope of this brief (please refer to WRI's *Keeping Forest as Forest: Incentives for the U.S. South* issue brief for more information), the more options that are available, the more likely it will be that local jurisdictions could pursue establishing public working forests.

On the supply side of the equation, county and municipal governments interested in working forests need to encourage family woodland owners and corporate timberland owners contemplating sales of their lands to developers to either donate or sell their lands to county or municipal governments or permit the establishment of conservation easements. In several states, there are favorable tax benefits associated with land or easement donations and sales below market price. According to the Conservation Resource Center (2007), these take the form of conditional tax credits or deductions in the states of Georgia, Mississippi, North Carolina, South Carolina, and Virginia. Extending these programs to other southern states would certainly help stimulate supply of lands on which working forests can be established.

In terms of increasing the amount of land potentially available for easements, county and municipal governments should work with woodland owners to expand awareness of the working forest options they may have as well as the effects of conservation easements. Studies have shown that most woodland owners have little to no understanding of the concept of a conservation easement and what the agreement entails. In fact, in the South, landowners' lack of understanding is cited as the number one obstacle to signing conservation easements. In a 2009 study undertaken by the American Forest Foundation, landowners who had not entered into a conservation agreement knew little or nothing about them, often leading them to incorrect assumptions (American Forest Foundation 2009). Of the landowners who had heard of working forest conservation easements, many were unsure if their assumptions or understanding were correct.

By adding working forest acquisition programs to the conservation toolkit, public agencies throughout the South can help implement a conservation model that pays off ecologically and

economically for taxpayers and woodland owners. Documenting these benefits, broadening the scale and scope of available financing options, offering favorable tax benefits, and educating woodland owners are key strategies that may enable public working forests to ensure southern forests for the future.

Notes

1. See New York state's innovative Avoided Deforestation Carbon Credit program, which allows counties to earn carbon credits from open space and forest protection: <<http://www.empirestatenews.net/News/20091005-5.html>>.
2. "Regulating services" are the benefits obtained from an ecosystem's control of natural processes such as climate, erosion, water flows, and pollination. "Cultural services" are the nonmaterial benefits obtained from an ecosystem, such as recreation, aesthetic enjoyment, and spiritual renewal.
3. A conservation easement is a legally enforceable land preservation agreement between a landowner and a government agency (municipal, county, state, or federal) or between a landowner and a qualified land protection organization (such as a land trust) for the purposes of conservation. It restricts certain activities on the property, such as real estate development and resource extraction, to a mutually agreed upon level. The decision to place a conservation easement on a property is voluntary and the property remains the private property of the landowner. Once set in place, the restrictions of the easement are binding on all future owners of the property. Landowners sometimes sell conservation easements to willing buyers, such as land trusts, or donate them.
4. These counties include: Chatham County, Georgia; Cobb County, Georgia; Forsyth County, Georgia; Lake County, Florida; Martin County, Florida; Matthews County, North Carolina, and Wake County, North Carolina. These public surveys were undertaken by The Trust for Public Land from 2003–2008.
5. This figure does not include Alaska and Hawaii.
6. However, to varying degrees, parks and open space can actually increase the value of surrounding land and development. The increased land value is then passed on to cities in the form of higher property taxes. These additional taxes can be used to pay for building and maintain the park or open space. This pricing phenomenon and the funding mechanism it enables are known as the "proximate principle" (Gies 2009).
7. Please refer to http://www.empirestatenews.net/News/20091005-5.html for more information about New York state's Avoided Deforestation Carbon Credit program.
8. According to a 2002 report by the Congressional Sportsmen's Foundation in partnership with the National Shooting Sports Foundation, hunters and anglers support more jobs nationwide (1.6 million) than Wal-Mart (1 million), the country's largest corporation. In 1995, U.S. Forest Service economists found that of the $125 billion generated annually from forest service lands, 75 percent came from recreation and just 15 percent from extractive activities, such as timber and mining. This information can also be found in a Trust for Public Land report by Gies (2009).
9. Erin Carver and James Caudill, *Banking on Nature 2006: The Economic Benefits to Local Communities of National Wildlife Refuge Visitation* (Washington, DC: U.S. Fish and Wildlife Service Division of Economics, 2007).

   This figure includes only benefits from direct recreational use, such as money spent on travel, lodging, food, and other goods and services.
10. The American Farmland Trust (AFT) has conducted many of these studies and continues to promote them. AFT lists 128 cost of community services studies (COCS) completed in 25 states between 1989 and 2007. Averaging the results of those studies reveals that for every U.S. dollar communities realized from residential development, communities had to deliver $1.16 in services. On average, lands developed for commercial or industrial use required communities to deliver only $0.29 in services for every dollar realized. But keeping land in agriculture is also cost effective, the research suggests. On average, farms and ranches demanded only $0.37 in community services for each dollar of economic benefit (Farmland Information Center 2007).
11. To simplify, the amount of adjacent developed property is set equal to the amount of land protected by the working forest acquisition.
12. Point Carbon Research projects that the price for each metric tonne of carbon dioxide equivalent (CO2e) would average US $26 over the period 2013–2020 under a federal cap-and-trade system as outlined in the American Power Act (APA): <<http://www.carbonoffsetsdaily.com/news-channels/usa/opinion-point-carbon-credits-to-average-us26t-in-early-years-of-us-ets-38875.htm>>.
13. Estimates for carbon credits and recreation fees in the model are crude figures derived from an analysis of a variety of public and nongovernmental publications pertaining to southern forests. Because the actual potential of any given tract of land varies widely throughout the South, conservative figures from the reported ranges were adopted.
14. Personal communication, Ryan Elting, The Nature Conservancy, 22 September 2010.
15. Article IX, Section 15 of the Alaska Constitution. View online at: <<http://ltgov.alaska.gov/services/constitution.php?section=9>>.
16. See <<http://www.apfc.org/home/Content/dividend/dividend.cfm>>.
17. See <<http://oregonwatersheds.org/whatcouncil>>.
18. See <<http://www.ririvers.org/about.htm>>.

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Acknowledgments

The authors are grateful to the following colleagues and peers who provided critical reviews and other valuable contributions to this publication: Evan Branosky (WRI), Story Clark (Conservation Consulting), Erin Wirpsa Eisenberg (CitySeed), Todd Gartner (WRI), William Todd Graeff (Coconino County Parks and Recreation Dept), Craig Hanson (WRI), Kirk Herbertson (WRI), Dylan Jenkins (The Nature Conservancy), Janet Ranganathan (WRI), Jessica Sargent-Michaud (The Trust for Public Land), Chris Snow (Wake County Parks, Recreation & Open Space), Peter Stein (Lyme Timber), Peter Stengel (U.S. Endowment for Forestry and Communities), Christopher Theriot (Ducks Unlimited), and David Tomberlin (WRI).

The publication process was helped along by WRI's experienced publications team, particularly Hyacinth Billings and Ashleigh Rich. We thank David Tomberlin for editing and proofreading. We also thank Maggie Powell for the publication layout.

We are indebted to Toyota for its generous financial support for this brief.

This report is released in the name of the World Resources Institute (WRI) and represents the perspectives and research of its authors alone. It does not necessarily represent the views of WRI, Toyota, the publication reviewers, or their affiliated organizations and agencies.

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ISBN: 978-1-56973-765-1