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October 2006

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DeBerry, Drue and Moore, Julie H., "Realizing the Potential of Family Forests: Tools to Facilitate Habitat Conservation" (2006). *11th Triennial National Wildlife & Fisheries Extension Specialists Conference (2006)*. 5.

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Realizing the Potential of Family Forests: Tools to Facilitate Habitat Conservation

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Abstract: The management of family-owned forests is discussed in light of conservation issues and development pressures. Safe Harbor Agreements and Candidate Conservation Agreements with Assurances are voluntary tools that can be used to protect conservation values, particularly habitat for threatened or endangered species. A case history of forest management practices to sustain the gopher tortoise in the Southeast is given.

Key Words: conservation, forestry, gopher tortoise, *Gopherus polyphemus*, private forests owners, threatened and endangered species, wildlife management

Proceedings, 11th Triennial National Wildlife and Fisheries
Extension Specialists Conference,
October 14-18, 2006, Big Sky, MT

Family Forest Demographics

Family Forests on the Landscape

U.S. forest ownership is broken into two broad categories of ownership: public and private. Private forests dominate in the eastern U.S.; in the West, the majority of forestland is in public ownership (Figure 1). Traditionally, private forests were broken into industrial and non-industrial holdings. The individual private forest holdings that did not include a wood products manufacturing capacity were referred to as Non-Industrial Private Forestlands (NIPFs) or non-controlled lands. A finer-scale approach divides ownership into two classes: business and family forests.

Family forests are those held by individuals, families, or groups that are not incorporated. Family forest owners hold 42% or 262 million acres out of 620 million acres of forestland in the U.S. (Butler and Leatherberry 2004). Ownerships of less than 10 acres are generally too small to manage for timber production and make up 7% or 19 million acres. Dividing forest ownerships into small (between 10 and 99 acres) and large (>100 acres) categories is conceptually useful for discussing the habitat conservation potential of family forestlands. Small ownerships comprise 42% or 103 million acres of family forests. Large ownerships make up 58% or 139 million acres (Butler and Leatherberry 2004). Smaller tracts produce lower quantities of timber products and are of less interest to timber buyers, potentially making it more difficult to practice sustainable forestry and maintain ownership viability for smaller properties. Forest ownerships that maintain a positive financial balance sheet are more likely to remain intact than ones that create a financial burden.

Who are Family Forest Owners?

The average family forest owner is 60 years old. Migration from rural areas to urban and suburban areas over the past 60 years means that heirs today are more likely to live in an urban or suburban setting than a rural one. This has led to a new generation of landowner who tends to be disconnected from traditional extension delivery methods and is less aware of forest management opportunities and resources (Newman et al. 1996). Finding new ways to connect with the new generation of family forest owners is critical.

Why Do They Own Forestland?

Forest owners more often cite aesthetics or nature, privacy, family legacy, or hunting and recreation as reasons for forest ownership (Butler and Leatherberry 2004). Owners should be receptive to management recommendations that will improve these qualities on their forests. Only 9% of forest owners identify timber

harvesting as an important reason for owning forestland, yet half the owners have harvested during their tenure. Owners who have harvested hold 71% of family forests. Management recommendations that improve non-timber forest qualities and still allow for timber production should have strong appeal to a spectrum of forest owners.

Development Threatens Wildlife and Family Forests

More than 90% of the nation's species that are federally designated as threatened or endangered have some or part of their habitat on non-federal forests (National Research Council 1998). Two-thirds of the United States' freshwater supply originates in forests (USDA FS 2000) having a direct impact on aquatic species. Habitat conservation on family forests can have a major impact for species and habitats. However, family forests share a common threat of many wildlife species – development. The most recent data show that more than 1 million acres of private forest is being lost every year. Between 1992 and 1997, 7 million acres of private forest was lost to development (Best 2002).

How Can Family Forests Strategically Help Achieve Habitat Conservation Goals?

MacArthur and Wilson's (1967) theory of island biogeography was the initial theory to recognize and describe the potential threats of habitat fragmentation to conservation of species. Metapopulation theory (Hanski and Gilpin 1991) refined earlier theory and modeled habitat as occupied patches interspersed in an unoccupied matrix. The assumptions behind metapopulation theory have had a strong influence on how species conservation is approached.

Habitat conservation efforts have largely focused on management and protection of public lands (e.g., National Parks, National Forests, Department of Defense lands, state wildlife management areas) and those held by conservation-oriented non-profit organizations (e.g., The Nature Conservancy, Conservation Fund, local land trusts). The presence or absence of species on these lands (occupied patches) is often known, whereas it is not on the private lands surrounding them. Although the surrounding matrix (i.e., private lands) may play an important role in conservation of occupied patches, attempts to conserve or improve this part of the landscape have been limited, in part due to the logistical challenges of connecting to and working with private landowners. The role that the family forests can play is an important one, limited only by owners' interest to participate, acreage held, and the availability of technical and cost-share assistance for family forest owners.

In cases where endemic species with small ranges are found on private forests, conservation of occupied patches through involvement of individual or small numbers of owners willing to cooperate across boundaries can have a significant benefit. Much of the conservation work with family forests to date has followed this pattern (e.g., bog turtles, *Glyptemys muhlenbergii* or *Clemmys muhlenbergii*, in the northeast; flatwoods salamander, *Ambystoma cingulatum*, in the South). Landowner trust in the resource professionals assisting with this type of project is essential.

In the long run, family forests may play a larger role providing high quality matrix habitat for species conservation. Family forests should be targeted for conservation outreach regardless of whether it is occupied or unoccupied (often difficult and expensive to ascertain) habitat, contiguous or distant from protected lands. Occupied or contiguous areas will likely remain the highest priorities for limited cost-share assistance; however, focusing outreach to a larger potential landowner pool should lead to greater landowner participation. Some academicians (Vandermeer and Carvajal 2001) have pointed out that while improving the quality of matrix habitat may benefit species in most cases, there are no guarantees. However, much more is at risk than whether or not a definitive benefit is accrued from improving matrix habitat. If we do not engage the family forest demographic in conservation efforts now, the option may not exist later.

While each individual family forest is unlikely to provide sufficient wildlife habitat for a discrete species population, the sum of ownerships participating in conservation efforts could. A conservation approach that includes improvement of matrix habitat quality can provide important conservation benefits including buffer habitat, connectivity between core areas, and an ability to manage adaptively.

Habitat Conservation Approaches for Declining Species

Species Designation and Conservation Benefit

Traditionally, species conservation efforts have been prioritized based on federal and state designations. The non-profit conservation organization NatureServe provides an opportunity to determine how closely rarity at different scales correlates to status designated by public wildlife agencies. A quick NatureServe data search of vascular plants and vertebrate animals reveals that while 1,150 species are federally listed as threatened or endangered, thousands more are in decline or at risk of extinction. There are 3,031 G1 (globally critically imperiled) or G2 (globally imperiled) species. If G3 species (globally vulnerable – at moderate risk of extinction) are included, the number of species at risk jumps to 6,002. If you include S1 (critically imperiled at the state level) or S2 (imperiled at the state level), the number grows to 13,950 (NatureServe 2006). Thus, official designation of species by a public agency does not necessarily identify the most urgent conservation priorities. In addition to threatened and endangered status, the U.S. Fish and Wildlife Service (FWS) designates as candidates those species “... for which the FWS has sufficient information on their biological status and threats to propose them as endangered or threatened under the Endangered Species Act, but for which development of a listing regulation is precluded by other higher priority listing activities.” The current FWS list of candidates includes less than 279 species. This is worth noting, because federal designation of species as threatened or endangered and the accompanying protections afforded by the Endangered Species Act (ESA) may discourage forest owners from participating in species conservation efforts. Conservation efforts targeting species in decline prior to federal designation under the ESA may have greater forest owner participation and greater conservation impact than those targeting species that are already federally listed.

Facilitation of Habitat Conservation with Regulatory Tools

Species designated federally as threatened or endangered (T&E) are often viewed by family forest owners as a problem to be dealt with on public lands rather than their own. A common perception is that goodwill efforts can become bureaucratic nightmares and lead to a loss of management flexibility. Providing forest owners with assurances through streamlined processes and the continued availability of management options should address these concerns and increase landowner participation in conservation efforts. Safe Harbor Agreements (SHAs) and Candidate Conservation Agreements with Assurances (CCAAs) are two regulatory, yet voluntary, FWS tools that can facilitate species conservation. Agreements are either individual or programmatic. Under programmatic agreements, one entity (e.g., state agency, county, water management district, non-profit organization, etc.) holds an umbrella permit under which individual owners can be added. While programmatic agreements can take longer to develop than individual agreements, once completed, the simplified process encourages more landowners to participate. As SHAs and CCAAs are not yet widely used, extensive outreach is needed to raise awareness and acceptance of these innovative tools.

When are Regulatory Tools Appropriate?

SHAs and CCAAs can only be used when an elementary understanding of the biology of a target species is recognized and population threats have been identified. This allows the FWS to gauge if the conservation benefits proposed in agreements will have a significant enough benefit to the species targeted by the agreement to warrant issuing assurances and incidental take permits to landowners. Use of regulatory tools will be most successful when: active management would benefit the target species; baseline populations can be readily determined; and landowners are unlikely to undertake conservation measures without the assurances that regulatory tools provide.

Safe Harbor Agreements

SHAs are voluntary agreements between non-federal landowners and an entity designated by FWS that target conservation of federally threatened or endangered species. The SHA standard requires that the conservation measures provide a net conservation benefit to the targeted species. Examples of conservation

measures that might provide a net conservation benefit include: increasing the amount of habitat for a species; maintaining an appropriate seral stage; providing buffer habitat for existing populations; establishing or maintaining links between nearby populations; and providing sites for relocation or reintroduction. In return, landowners receive authorization to return their property to the baseline conditions that existed when the agreement was signed. The baseline conditions are determined by establishing population numbers and distribution and/or habitat acreage or riparian miles.

A summary of the information in a SHA includes: species and habitats to be covered; duration of agreement; baseline conditions; conservation measures or management actions to be taken; incidental take levels anticipated; a 30-day notification requirement; and a plan for monitoring and designation of responsible parties.

Candidate Conservation Agreements with Assurances

CCAAs differ from SHAs in that they target species that are in decline but are not yet listed. CCAAs also offer different assurances from SHAs. CCAAs are voluntary agreements between any non-federal landowner and an entity designated by the FWS. Under the CCAAs, the landowner agrees to carry out specific management activities that will provide a conservation benefit for candidate, proposed, and/or potential candidate species. This provides a significant opportunity to address conservation of thousands of species that do not yet have the stigma of being listed. In return, FWS provides assurances to the enrolled landowner that no further resource restrictions will be imposed on or requested of the landowner if the species becomes listed. If the species becomes listed, take is authorized through an enhancement of survival permit. The assurances provided are transferable with the enrolled lands and are valid for the length of the agreement as long as the current landowner is complying with the agreement. The CCAA standard requires that the benefits of a CCAA should preclude the need to list the covered species. It is assumed that benefits provided by one landowner can be coupled with similar management by other landowners within the range of the enrolled species to preclude the need to list the species.

Case Study of the Gopher Tortoise

The gopher tortoise (*Gopherus polyphemus*) is found from South Carolina south through much of Florida and west to Louisiana. The species' federally listed range extends from the Tombigbee and Mobile Rivers in Alabama west to southeastern Louisiana. As noted in the Gopher Tortoise Recovery Plan, "the natural longleaf pine community and its associated biological diversity represent optimal forest habitat for the gopher tortoise" (U.S. Fish and Wildlife Service 1990). Listed as threatened in 1987, the gopher tortoise is a keystone species (Noss 1988); 362 species have been documented using the tortoise's burrows (Jackson and Milstrey 1989). The tortoise is also the primary grazer in its xeric habitat (Landers 1980), plays a major role in grass seed distribution (Wilson et al. 1997), and may contribute to high plant species richness in the longleaf pine ecosystem (Hermann 1993). Thus, conserving the gopher tortoise benefits many other species as well.

Reasons for listing of the tortoise include loss of open, fire-maintained pine forests, habitat fragmentation, human predation, and declining density in remaining populations (Diemer 1986, Lohofener and Lohmeier 1984). The tortoise is also threatened by two invasive species: cogongrass (*Imperata cylindrica*), which crowds out native plants and interferes with fire regimes, and fire ants (*Solenopsis invicta*), which kill tortoise hatchlings.

The American Forest Foundation's national habitat conservation program, Forests for Watersheds and Wildlife (F2W2), has been working with private, state, and federal partners since 2003 to assist in the recovery of the gopher tortoise in its listed range. A landowner guide, the "Pine Ecosystem Conservation Handbook for the Gopher Tortoise" has been distributed to over 2,000 family forest owners holding more than 425,000 hectares. Field days have demonstrated conservation practices used by their peers to 185 family forest owners holding 14,380 hectares. A sign program to raise conservation awareness has been embraced by 46 forest owners, who collectively hold 9,712 hectares and plan to outreach to 36,000 more

people. The recovery plan for the gopher tortoise in its current listed range requires a minimum of 20,230 ha of gopher tortoise habitat on private forests under a SHA.

John Lambert, a family forest owner in Covington County, Mississippi, entered his 750-acre property into an individual SHA for the gopher tortoise in 2003. This initial agreement was to serve as the model for the development of a programmatic agreement for use in the 20 counties and 3 parishes in 3 states where the tortoise is listed. The programmatic agreement is expected to be completed by early 2008. Sixty percent of family forest owners responding to post field day surveys have indicated that they want to learn more about the programmatic SHA for the gopher tortoise when it is available.

The eastern population of the gopher tortoise has declined, due to many of the same threats suffered by the listed population. The FWS received a petition to list the gopher tortoise in its eastern range in January 2006. The tortoise populations are afforded varying degrees of protection by their state designations but are not federally listed as threatened or endangered. This presents an opportunity to achieve a significant conservation impact for a declining species prior to federal listing. A cooperative multi-party conservation initiative that encourages habitat conservation and CCAAs would address species needs and forest owner concerns at the same time.

Conclusion

Habitat conservation for declining species on family forestlands will require major outreach efforts to be successful at the landscape level. The size of the target audience and the scope of what is needed to achieve conservation goals are daunting. Success will require partnerships between key players in the public and private sector.

As decision makers for 262 million acres of forestland in the U.S., family forest owners can play a significant role in habitat conservation. The elusive yet ubiquitous nature of this landowner demographic makes it both extremely promising and challenging. Aldo Leopold wrote “Conservation means harmony between landowners and the land. When land does well for its owner, and the owner does well by his land; when both end up better by reason of their partnership, we have conservation. When one or the other grows poorer, we do not.” (Leopold 1939).

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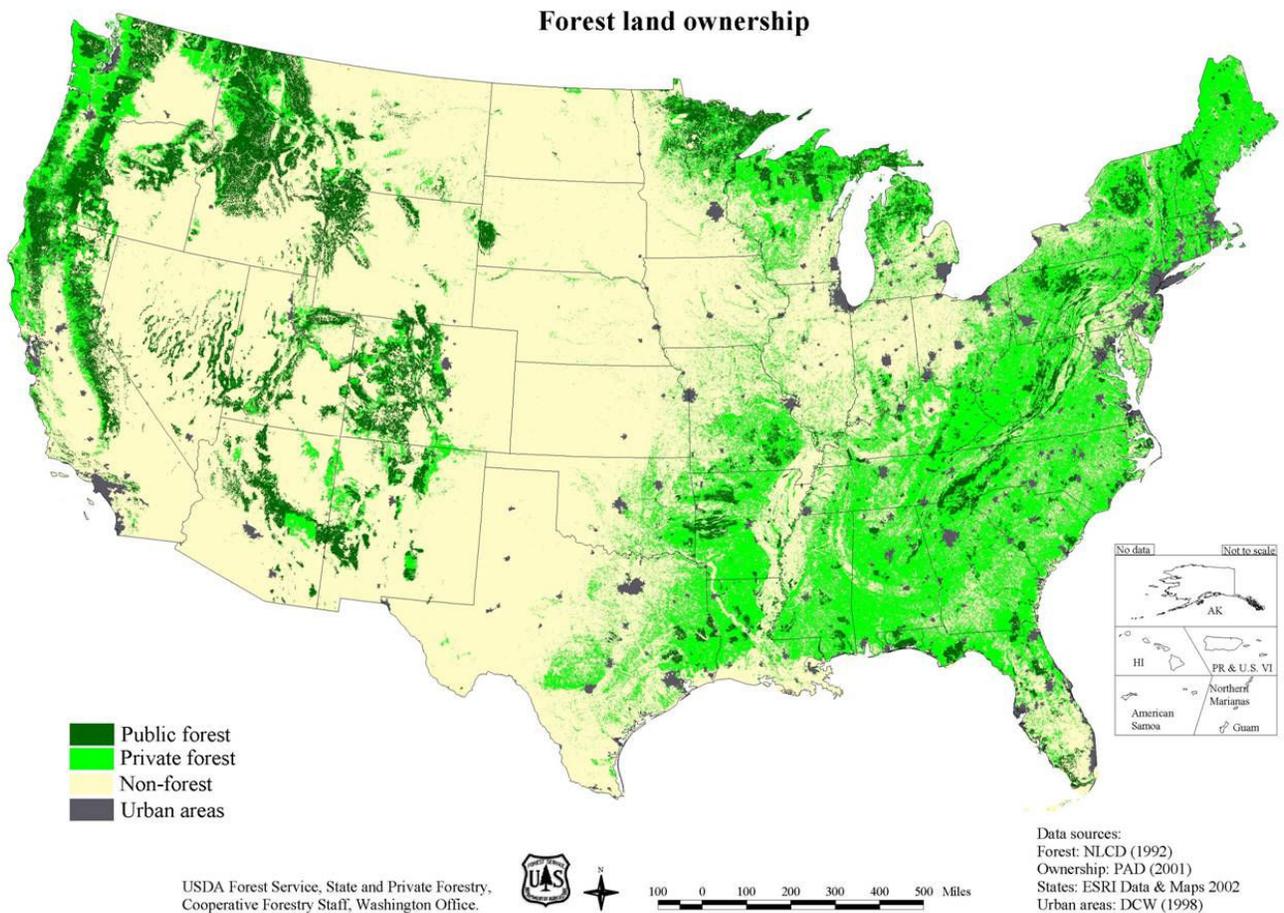


Figure 1. Patterns of forest ownership in the United States.