Photo courtesy of Mississippi Department of Wildlife, Fisheries & Parks (MDWFP)

Wildlife Forestry in Bottomland Hardwoods:
Desired Forest Conditions for Wild Turkey, White-tailed Deer and Other Wildlife

Prepared by the Lower Mississippi Valley Joint Venture Forest Resource Conservation Working Group February 2011

Photo courtesy of LDWF

The primary focus of wildlife forestry is to manage the timber resource in a manner that produces optimum wildlife habitat for targeted wildlife species. Stated another way, the primary objective of forest management for wildlife should be to establish and maintain suitable habitat conditions for priority wildlife species, including deer, turkey, squirrel and other resident and migratory species. To accomplish this, a mosaic of forest stand conditions should be developed through all forest communities on a property by repetitive silvicultural treatments (varied treatments of forest stands accomplished to sustain productivity). The forest stand parameters that are critical to achieving this primary objective include, but are not limited to:

- multi–tree species compositions, as appropriate for the site, in all stands (i.e., high tree species diversity);
- multiple tree size classes within stands;
- forest canopy densities that provide for establishment and maintenance of understory and midstory stand components sufficient to meet habitat needs;
- creation of forest canopy gaps through tree removal (group selection) to establish/release desirable advanced regeneration and internal stand structure.

These parameters should be considered when implementing any treatments (timber sales). Dependent upon forest stand conditions relative to habitat needs of priority wildlife species present at any location, treatment intensity and timber marking guidelines should be adjusted as needed to achieve desired forest conditions. The objective is to develop and maintain a multi-age, highly diverse forest which provides adequate understory, midstory and overstory forest stand components with vertical and horizontal structural diversity on all acres of the forest.

The process to build, maintain, and monitor desirable wildlife habitat should be guided by the extensive work done by resource managers throughout the Lower Mississippi Valley and detailed in the Lower Mississippi Valley Joint Venture (LMVJV) publication entitled "*Restoration, Management and Monitoring of Forest Resources in the Mississippi Alluvial Valley: Recommendations for Enhancing Wildlife Habitat*."

LMVJV is a self-directed, non-regulatory, private, state, and federal conservation partnership that exists for the purpose of implementing the goals and objectives of national and international bird conservation plans within the Lower Mississippi Valley region. The LMVJV Forest Resource Conservation Working Group, composed of many private, state and federal foresters, biologists and researchers developed and published bottomland hardwood management recommendations designed to achieve and maintain habitat conditions in mixed species bottomland hardwood forest communities suitable for songbirds, species of concern such as black bear, and other forest dependent wildlife.

These recommendations also apply where wildlife priorities are game species such as deer, duck, rabbit, squirrel and turkey. To reflect this broader application, the working group is currently revising the management document to incorporate, within the framework of desired forest conditions, basic life requirements and biology of game species. Further, LMVJV management recommendations are a summary of the management efforts that have been used for decades by wildlife resource managers on public lands to improve forest wildlife habitat for game and nongame species. Specifically, the adaptive forest management approach detailed in this plan is currently being used by the Arkansas Game and Fish Commission, the Louisiana Department of Wildlife and Fisheries, the Mississippi Department of Wildlife, Fisheries, and Parks, and the U.S. Fish and Wildlife Service for management of their hardwood forest resources.

Forest management plans on properties with wildlife as a primary objective and that are located within the Mississippi Alluvial Valley are encouraged to use forest management recommendations developed by the LMVJV Forest Resource Conservation Working Group. The recommendations focus on:

- **Desired forest conditions** - vertical and horizontal structural diversity in terms of tree species, size, age and growth form.
- **Long-term forest sustainability** - ensures that desired tree species on the appropriate sites are successfully regenerated.

Photo by Randy Wilson

Photo by Kenny Ribbeck

- **Silvicultural practices** - desired forest conditions across the property are attained through thoughtfully planned and carefully executed timber harvests.

A combination of single-tree and group selection harvests is the preferred silvicultural technique to develop and maintain desired forest conditions necessary for sustaining and enhancing wildlife populations in bottomland hardwood forests. Individual or single-tree selection is used to thin the overstory and midstory of stands to desired densities for habitat improvement. Group selection (removal of clumps of trees, normally not exceeding one to two acres in size) is used to create needed horizontal and vertical structural diversity within stands, establish regeneration of shade intolerant species such as oaks and pecans, or release established advance regeneration. These two silvicultural techniques, applied together and continuously across the forest (also known as a *variable retention harvest*) have proven highly effective in attaining and maintaining desired forest conditions for optimum wildlife habitat productivity for priority wildlife species throughout the southern bottomland hardwood ecosystem. Due consideration must be given to the many critical variables (e.g., stem age class distributions, crown closure, species composition, availability of cavities, ground cover, etc) needed for habitat diversity within each individual stand and across the landscape. However, even with the preference for use of single-tree and small group selection harvest techniques, land managers should recognize that some specific forest conditions may warrant the use of other silvicultural practices such as clearcutting, modified shelterwoods, or any combination of techniques to obtain wildlife habitat objectives.

When single-tree and group selection techniques are used, thinning activities in all sales will emphasize leaving variable tree densities within the residual stand by frequently adjusting harvest intensities to create a mosaic of density conditions. Treatments also will emphasize establishing small group selection holes (generally less than two acres) throughout the sale area at a recommended rate of approximately one for every 10-20 acres to establish stand structure and promote regeneration of shade-intolerant species. The intent is to create a complex forest which is highly variable in terms of tree species, tree densities, horizontal and vertical structure, tree size and age classes, and canopy closure. The resulting wide range of habitat conditions found within and throughout each treatment area is a sharp contrast to establishing predetermined, large blocks of similar habitat which characterize even-age forest management. Use of the single-tree and small group selection approach typically provides the opportunity for periodic reentry into stands for subsequent harvest treatments as needed to maintain desired conditions, thus allowing the landowner continuous options for adjustments to management approaches and intensity, as conditions, priorities, or markets change. In short, the approach utilized will be low-to-moderate intensity, adaptive management applied as needed to achieve the landowner's priorities of "wildlife first."

DESIRED FOREST CONDITIONS

The health and productivity of forest dwelling wildlife are not only impacted by the size, structure, and composition of the forest, but also by the distribution of diverse forest conditions. The table below, taken in part from the LMVJV document, sets forth key forest stand parameters and values for these parameters that will function as a guide for silvicultural actions (i.e., timber sales) in mixed species stands, and should be used as decision criteria for future treatments.

The range of stand parameter values presented, when present in combination with the other criteria (i.e., high tree species diversity, mixed-age distributions, varied size class distributions), will provide habitat conditions needed to achieve desired wildlife priorities. It is important to understand that these parameters and values function only as recommendations, and that current stand conditions may exist that require deviation from these general recommendations and parameter values (e.g., plantations created by previous owners, high-grading in previous sales, naturally occurring monoculture stands of species such as willows and cottonwoods, clear cutting and/or heavy shelterwood cuts in previous sales, and an understory captured by shade tolerant species).

PRIORITY WILDLIFE SPECIES HABITAT REQUIREMENTS

Photo by Joe Mac Hudspeth, Jr.

WILD TURKEY

Bottomland hardwood stands are often heavily utilized by wild turkeys. Properly managed stands can sustain turkey populations if vegetative conditions provide adequate food and cover needed for life history requirements including roosting, nesting, and brood-rearing. While wild turkey poults require high protein foods such as insects and young vegetation, juvenile and adult wild turkeys are opportunistic omnivores and use a variety of food items including animal matter, hard and soft mast, green forage, tubers, seeds, and grains. Sufficient cover is essential to wild turkey survival. Mature trees are necessary for escape cover and nocturnal roost sites for juvenile and adult wild turkeys. Patches of dense undergrowth are vital cover for wild turkey poults.

Although wild turkeys nest in various habitat types, such as forested stands and fallow fields, the common denominator of all nesting habitat is well-developed vegetation that provides lateral cover within three feet above ground to conceal nesting hens. Turkeys typically select nesting sites with denser, taller, understory vegetation and with lower overstory density (trees/acre), basal area, and percent canopy cover when compared to sites not selected for nesting. Although preferred nesting structure is provided by a variety of habitats, nesting success rates vary greatly by habitat type. Success rates are typically much higher for nests occurring in contiguous, forested habitats with suitable understory cover compared to nests occurring in regeneration areas (clearcuts). Although young regeneration areas (typically less than 5 years old) provide excellent nesting structure and are often preferred by nesting hens, these areas normally support higher small mammal populations which attract and concentrate predators. Regeneration areas therefore can effectively become "predator traps" by attracting hens to nest and exposing them to predation.

Brood-rearing habitat must provide protein-rich foods (generally insects) and overhead protective cover, while being open enough at ground level for broods to move freely. Brood-rearing habitat can be created in bottomland hardwoods by selectively harvesting timber. Thinning forest stands increases understory and herbaceous cover, and greatly improves brood-rearing habitats when compared to stands that have not been thinned. Research has demonstrated that poult survival was significantly higher in areas with selective timber harvesting than in unharvested areas.

Forest management for wild turkeys should be directed towards providing quality nesting, brood-rearing, feeding and roosting habitat. Implementing variable retention timber harvests, including spatially distributed group selection cuts, across sufficient acreage will provide quality nesting, brood-rearing, and roosting habitat conditions that reduce predation rates and increase turkey populations. This forest management strategy allows greater acreages to be treated with more frequent entries into timber stands, thereby ensuring quality turkey habitat is sustainable across the property. Furthermore, due to the mosaic of habitat conditions created within timber stands by variable retention harvests, these areas are still conducive to turkey hunting immediately after timber harvest operations occur.

FOREST VARIABLES[1]	DESIRED STAND STRUCTURE	CONDITIONS THAT MAY WARRANT MANAGEMENT
Primary Management Factors		
Overstory Canopy Cover	60-70%	>80%
Midstory Cover	25-40%	<20% or >50%
Basal Area[2]	60-70 ft²/acre with ≥ 25% in older classes[3]	>90 ft²/acre OR ≥60% in older age classes
Secondary Management Factors		
Dominant Trees	>2/acre	<1/acre
Understory Cover	25-40%	<20%
Regeneration[4]	30-40% of area	<20% of area
Small Cavities (<10-inch diameter)	>4 visible holes/acre OR >4 "snag" stems ≥4 inch dbh OR ≥2 stems >20 inch dbh	<2 visible holes/acre OR <2 snags ≥4 inch dbh OR <1 stem ≥20 inch dbh

1 Promotion of species and structural diversity within stands is the underlying principle of management. Management should promote vines, cane and Spanish moss within site limitations.

2 Basal area is the square foot occupancy of woody stems measured at 4.5 feet above ground level on an acre of land; one acre of land occupies 43,560 square feet.

3 "Older age class" stems are those approaching biological maturity. We do not advocate aging individual trees, but use of species-site-size relationships as a practical surrogate to discern age.

4 Advanced regeneration of shade-intolerant trees in sufficient numbers (about 400 per acre) to ensure their succession to forest canopy. Areas lacking canopy (i.e., group cuts) should be restricted to less than 20 percent of stand area.

Photo by Michael A. Kelly

WHITE-TAILED DEER

White-tailed deer have flexible habitat requirements that allow them to thrive within a wide range of habitat types. The fertile soils of the Mississippi Alluvial Valley (MAV) produce diverse and nutritious vegetation that supports some of the highest carrying capacities of white-tailed deer in the southeast. Deer habitat requirements are best met by areas with high habitat diversity that provide adequate nutrition and escape cover. Early successional plant communities provide abundant herbaceous forage and summer mast, whereas later successional forests provide fall and winter mast and limited browse. A mixture of successional stages, easily created through the mosaic pattern of group selection intermixed with individual selection harvests, provides year-round forage and cover.

Deer are opportunistic herbivores with a diet that includes annual and perennial forbs (broad-leaved herbaceous plants), fruits, hard mast, grasses, flowers, and fungi. Hard mast, primarily pecans and acorns, is an important component of a deer's diet during autumn and winter. However, hard mast productivity is highly variable and may be severely limited in some years. Fruits from a variety of plants, including persimmon, honey locust, blackberry, dewberry, and pokeberry are consumed during summer and autumn. When available, forbs (herbaceous plants) comprise a significant portion of the warm-season diet of white-tailed deer. Commonly browsed plants in the MAV include various species of ragweed, wild lettuce, pokeweed, southern dewberry, swamp privet, rattan vine, trumpet creeper, elderberry and greenbrier.

Forest management activities greatly influence deer habitat quality. Selective timber harvests which produce diverse structural and species composition within forested stands will provide desirable habitat conditions comprised of early and late successional plant communities. Furthermore, variable retention harvests that incorporate group selection cuts provide a mosaic of early and late successional plant communities within individual timber stands, thus producing an abundance of quality forage and cover distributed in a manner that optimizes deer habitat. The reduced harvest intensity that occurs with variable retention harvests, when compared to even-aged timber management, is conducive to treating larger acreages and with shorter intervals between harvests. This management strategy not only ensures quality deer habitat is maintained throughout the property over time, but also facilitates maximum deer hunting opportunities.

It is important to understand that white-tailed deer are considered keystone herbivores and unchecked deer populations may destroy their own habitat, significantly impacting forest ecology. Population management through adequate buck and doe harvests is required to maintain deer populations within carrying capacity and limit over-browsing of desirable regeneration and plants that provide food and cover for deer and other wildlife. Overpopulated deer herds have demonstrated negative impact to forest regeneration, impacting long-term sustainability of desired forest stand composition and structure.

Photo courtesy of USFWS

WATERFOWL

Use of forested wetlands by waterfowl species is dynamic and varies among seasons and flood conditions with the availability of water, food and cover. Priority waterfowl include mallards, wood ducks, hooded mergansers, gadwalls, green-winged teal, and ring-necked ducks. Some species, such as mallards, use forested wetlands in the MAV only during migration and winter, whereas residents, including wood ducks and hooded mergansers, are present year-round. Red oak acorns are an important source of energy for waterfowl. Samaras (seeds) of red maple and elms are important foods for wood ducks in spring. Forested and shrub wetlands provide aquatic invertebrates (dragonfly nymphs, waterboatmen, whirligig beetles, snails, amphipods, daphnia, midge larvae, adult and larval beetles, etc) and herbaceous seeds, as well as protective cover. These food items, which are high in essential amino acids, make up a large proportion of the diet of females during late-winter, when these birds are experiencing their pre-basic feather molt and preparing for the breeding season. Flooded forests also provide locations for pairs to isolate and initiate breeding activities. Shrubs and small trees that grow in canopy gaps to form the midstory provide cover used for seclusion during pair bonding. Disturbances and resulting canopy gaps in hardwood forests provide sunlight where herbaceous vegetation can thrive in the understory.

Wood ducks and hooded mergansers require relatively large cavities for nesting. The availability of cavities depends upon large primary excavators, such as pileated woodpeckers, and large or stressed trees, especially American sycamore, oaks, elms, and bald cypress. Suitable nesting cavities are typically limited in most bottomland hardwood forests. Therefore, managers should favor retaining cavity trees when planning management prescriptions.

In the past, managers attempted to obtain more benefits from forested wetlands for waterfowl and hunters by constructing 'greentree' reservoirs (GTRs) to ensure flooding occurred. However, decades of research and experience has shown that early flooding, annual flooding, and delayed spring drawdown can result in decreased acorn production, increased tree mortality, and gradual replacement of oak stands with species that are more water-tolerant but produce less food for waterfowl. These modifications in hydrology cause changes in the diverse flora and fauna that are adapted to normal seasonal and long-term fluctuating water regimes. Several publications address the ecology and management of GTRs, but current guidelines for management recommend alternate year and variable flooding. Management personnel should regularly assess GTRs to evaluate oak regeneration, beaver damage and general forest health, and plan necessary infrastructure enhancements to manage water more effectively. These actions should be taken to ensure continued waterfowl use and to provide long-term, high-quality hunting experiences.

SQUIRRELS

Squirrel species that occur in the MAV include the fox squirrel and gray squirrel. Fox squirrels and gray squirrels typically occur in the same areas of mature forests in the MAV, although observational accounts suggest that fox squirrels and gray squirrels select areas that differ in microhabitat characteristics. Fox squirrels are generally more terrestrial than gray squirrels and likely select more open hardwood forests with sparse understory. An open understory possibly facilitates detecting predators that utilize ambush hunting techniques. Gray squirrels are more arboreal (prone to spend more time in trees) than fox squirrels, although gray squirrels will readily forage on the ground. However, gray squirrels appear to select sites with relatively dense understory cover. Both species use cavities in live or dead trees as dens. Cavities may provide greater thermal cover and more protected nesting areas for raising young. Leaf nests are also used by both species for resting, escape cover and rearing young. Gray squirrels utilize a variety of hard and soft mast, fruits, insects, eggs, buds, bark, roots, and fungi as forage. Fox squirrels utilize similar variety of food resources as gray squirrels. Annual squirrel populations are often dependent on mast such as acorns and hickory nuts.

Squirrels appear to be relatively tolerant of selective timber harvest, although logging may have some short-term negative effects on squirrels. Timber harvests that retain a diversity of seed- and fruit-producing trees, and promote shrubs and vines, should produce abundant seasonal food resources and have few, if any, adverse impacts on squirrel populations. Selective timber harvests promote the availability of a diversity of food resources throughout the year and may mitigate any loss of hard mast from removing some mature trees. Since hard mast is a primary fall and winter food resource, other food resources become even more important during years of poor hard mast production.

Photo by Joe Mac Hudspeth, Jr.

Maintaining a diversity of basal area and canopy cover within mature hardwood forest stands should produce suitable microhabitat conditions selected by gray and fox squirrels. Canopy gaps created by timber harvest within mature hardwood forest stands likely improve seasonal habitats for gray squirrels by increasing shrub and midstory canopy cover while maintaining adequate forage production. Maintaining areas with greater basal area and dominant tree canopy cover provides open ground cover conditions important to fox squirrels, while retention of cavity trees or snags provides secure den sites.

The diversity of habitat conditions required by gray and fox squirrels can be created by implementing variable retention harvests that incorporate group selection. Timber stands treated in this manner will support abundant squirrel populations, while also providing favorable conditions for squirrel hunting.

Photo courtesy of MDWFP

RABBITS

Rabbit species that occur in the MAV include the swamp rabbit and eastern cottontail rabbit. Both species depend upon early successional habitats to provide their life requirements. Swamp rabbits are closely associated with bottomland forests and wetlands, while cottontails are more common on slightly higher elevations and drier sites. However, habitat ranges occupied by cottontail rabbits do sometimes overlap with areas used by swamp rabbits, and both species utilize many of the same habitat features. Shrubby thickets, vines, cane, blackberry, fallen trees (or tree tops), and logs are important cover components. Downed logs and tree stumps are used to deposit fecal pellets that serve as territorial markers. Herbaceous vegetation is very important for both cover and forage resources, and woody browse is also utilized for forage.

The most likely cause of declining swamp rabbit populations in bottomland forests is the lack of forest management and/or natural disturbances. These events create appropriate habitat conditions that meet annual life cycle requirements of rabbits. Swamp rabbit habitat is improved by disturbance in bottomland hardwood forests. Canopy gaps, whether created by natural tree falls, tree mortality, or timber harvest, are important for swamp rabbits. However, swamp rabbits use areas of closed-canopy forest structure for some parts of their annual requirements. Thus, timber harvests that create spatially distributed canopy gaps can increase habitat quality for rabbits as well as other early successional habitat-associated species. Because the early successional habitat components created by canopy gaps are temporary, periodic disturbances to the forest canopy are required to maintain suitable swamp rabbit habitat across the property. Variable retention timber harvests that incorporate small, group selection cuts is the preferred forest management strategy for creating suitable rabbit habitat in bottomland hardwoods.

FOREST MANAGEMENT CONSIDERATIONS

Photo courtesy of MDWFP

- A long-term forest management plan is needed to ensure continuity of management and to provide management direction.
- A systematic forest inventory is needed to provide baseline conditions for the entire property.
- A management plan should identify priority areas and approximate timelines for timber harvest. Consideration should be given to spacing harvests across the property instead of placing them near each other. This should effectively distribute the habitat benefits created by the treatments over the largest area possible.
- Bottomland hardwoods treated with DFC recommendations may be productive enough to sustain partial timber harvests at intervals more frequent than occurred historically. Intervals of 10-15 years are commonly expected.
- Evaluate wildlife habitat conditions within timber management units approximately every 10 years to determine need for treatments (timber harvests). However, the length of time between stand entries for evaluation and treatments should be related to the intensity of previous timber harvests and site productivity. Usually, the more productive sites require more frequent entries. Also, more aggressive timber harvests (e.g. clearcuts) require less frequent entries.
- If economics are driving management decisions, harvest more acres at DFC intensity instead of increasing harvest intensity on fewer acres.
- DFC conditions are not meant to be achieved on every acre. The recommended distribution of DFC conditions on a property is 30 percent growing into DFCs, 40 percent in DFCs, and 30 percent growing out of or out of DFCs.
- Depending on current stand conditions, it may not be possible to obtain DFC conditions in a single treatment.
- Tree species composition is dictated by site, therefore management goals should match tree species with site conditions.
- No tree species is sacred and, therefore, should not be totally protected from harvest. Often the reduced light under mature oaks and pecans is not sufficient to allow or sustain regeneration of those species. Seedlings are often suppressed due to lack of light allowed to pass through from the overhead trees of the same species. However, light filtered by other species allows oaks and pecan seedlings to become established. Totally protecting certain species (pecan, oak) may result in over-harvesting other species in a stand, and may result in retention of poor quality trees that produce less mast.
- Tree species composition should include 30 to 50 percent hard mast producing trees where appropriate for site conditions.
- Favor retention of less abundant tree species to maintain diversity.
- Exercise caution in thinning areas where the midstory is dominated by non-merchantable, shade-tolerant species (i.e. boxelder, ironwood), possibly resulting in the release of less desirable species into the overstory. Landowners should consider incorporating provisions in timber sale contracts requiring all marked trees to be cut along with penalty provisions for not cutting marked trees. Such provisions allow the manager to reduce the density of non-merchantable, shade-tolerant trees, which when released can dominate future stands and reduce habitat quality.
- Implement harvests that permit greater flexibility in management options during the next entry. Individual tree selection and group selection harvest carried out in a variable retention harvest design should be used to create a mosaic of habitat conditions and spatial diversity.
- Avoid systematic or uniform spacing of retained trees.
- If forest stand structural diversity (i.e. numerous small thickets, canopy gaps, etc) or advanced regeneration is lacking, create canopy gaps using group selection throughout the stand at a rate of at least one per 10-20 acres.
- Use naturally occurring gaps in hardwood canopies as potential group selection sites.
- Create diversity in structure with a mosaic layout of group selection harvests across the landscape.
- Make ¼ - ½ acre canopy gaps on south side of mature, shade-intolerant species (pecan, oaks) to increase the potential for establishment of desired regeneration.
- Cut poorly-formed red oaks, pecan and persimmon (less than 12 inches DBH) to stimulate stump sprouts and obtain regeneration.
- Allow greater light on areas with advanced regeneration by creating larger canopy gaps (up to 2 to 3 acres).
- With an adequate seed source and appropriate harvest treatment, natural regeneration of native species is usually adequate and less expensive compared to planting seedlings.
- If conditions warrant, consider supplemental planting seedlings of species appropriate to site conditions.

Photo courtesy of MDWFP

FREQUENTLY ASKED QUESTIONS

Photos courtesy of MDWFP

WHAT ARE DESIRED FOREST CONDITIONS (DFCS)?

DFCs, as identified by the LMVJV Forest Resource Conservation Working Group, are forest conditions that provide productive habitat for wildlife by increasing diversity in tree species composition, vertical and horizontal structure, tree age, and canopy densities within forest stands, creating a patchwork of habitats that benefit a wide variety of wildlife species. DFCs are intended to reflect some of the structural characteristics found in forests after long periods of natural disturbance.

DFCs are described by factors (e.g., canopy cover, midstory, basal area/tree density) that managers can manipulate through prescribed harvests and secondary factors (e.g., regeneration, cavities, understory cover, etc.) that respond indirectly to management prescriptions. Importantly, DFCs are **NOT** intended to be met on every acre within a stand or within a landscape. Instead, these forest parameters when measured across the stand should, on average, be within desired stand conditions. By maintaining some portions of the forest in DFCs, some growing into DFCs, and some growing out of DFCs (and requiring treatments, again) the system is sustainable over time.

WHAT IS WILDLIFE FORESTRY?

Forestry is the art, science, and practice of studying and managing forests and related natural resources to benefit society and meet desired goals and values. Traditional forest management has focused on maximizing timber production through silvicultural methods that promote optimal growth and vigorous health of economically valuable tree species. Wildlife forestry is a more ecological approach that utilizes traditional silvicultural methods to establish and maintain optimal habitat conditions for game and nongame wildlife species. Wildlife forestry is economically viable, but it does not maximize timber production at the expense of wildlife habitat values.

DO DFCS PERTAIN TO ALL BOTTOMLAND HARDWOOD FORESTS AND FOREST-DEPENDENT WILDLIFE?

Yes. Even though some bottomland hardwood forests are small and may not have all of the priority wildlife species (i.e., species of special conservation concern), implementing DFC recommendations benefits many wildlife species as well as overall forest health and diversity. Game species such as wild turkey, white-tailed deer, squirrels, rabbits, and waterfowl benefit from improved habitat conditions created by implementing DFC recommendations. Variable retention harvests promote species and structural diversity resulting in increased forage and cover throughout the year. DFC recommendations allow treatments on larger acreages and at more frequent intervals than traditional forest management. Therefore, wildlife habitat values are maintained over time and throughout the landscape.

DOES THIS REPORT PUT FORTH SPECIFIC MANAGEMENT PRESCRIPTIONS?

No. This report does not specify management prescriptions. Instead, recommendations are couched within specific habitat conditions, so that managers can evaluate site-dependent conditions and limitations to determine the most appropriate management prescriptions for achieving DFCs.

IS MANAGING FOR DFCS ECONOMICALLY FEASIBLE AND PRUDENT?

Yes. Managing for DFCs is commercially viable, but does differ from traditional forest management. The DFC management approach requires more frequent timber harvests within management units, although each harvest typically yields less volume per acre than traditional practices. Harvest revenues from individual timber cuts may be less, but should be offset by the steady return from more frequent harvests. It is the opinion of many members of the committee that the benefits to wildlife will outweigh the potential loss, if any, of income. Additionally, the diversity of tree species and product classes that are retained by variable retention harvests allow greater future management options that can capitalize on fluctuating markets.

ARE THESE MANAGEMENT RECOMMENDATIONS APPROPRIATE FOR PRIVATE LANDOWNERS?

Yes. These management recommendations will provide desired forest conditions in any bottomland hardwood tract regardless of ownership. If optimizing habitat for forest-dependant wildlife is the primary objective, private and public bottomland hardwood forests will benefit by following DFC recommendations.

DO DFCS PROMOTE REGENERATION OF SHADE-INTOLERANT SPECIES?

Yes. Regeneration is encouraged through silvicultural treatments to establish advanced regeneration of shade-intolerant species on 30 to 40 percent of treated stands. Although silvicultural practices that retain forest structure are necessary to achieve DFCs, all silvicultural management tools are available to manipulate forest structure as needed to regenerate and release shade-intolerant species. However, large (more than seven acres) clearcuts should not represent more than 10 percent of any local landscape and group selection cuts (i.e., clearcuts less than seven acres) should be limited to less than 20 percent of the area of treated stands.

HOW DO REFORESTED STANDS FIT INTO DFCS?

Reforested stands are considered regeneration stands. However, reforested stands are not limited to 10 percent of the landscape as are regeneration harvests (e.g., more than seven-acre clearcuts). Achieving increased forest cover (i.e., reforestation) within the landscape overrides the 10 percent limitation placed on regeneration. Additionally, as restored stands develop, stand-level factors (i.e., midstory, overstory, vines, coarse woody debris, etc.) evolve, leading to development of structurally diverse forest systems that contribute to desired stand-level conditions.

WHAT IS THE JUSTIFICATION FOR INCREASING REFORESTATION STOCKING RATES GIVEN ITS GREATER COST?

Increasing potential structural competition in the developing forest will promote quality attributes of the trees, leading to greater management options. If early silvicultural treatments within regenerating stands are not feasible, natural competition will allow greater mortality in the forest. This will provide deadwood/coarse woody debris, an important secondary management factor normally absent in lesser stocked stands during the early stages of forest development.

Photo courtesy of MDWFP

FOR MORE INFORMATION

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