

CHAPTER 9

Public Use & Education

9.1 Background

Savage River State Forest is an integral component of a larger greenway system that connects other public and private forest and state parks. These sites, in addition to their natural, cultural and historic values, provide a variety of recreational opportunities. Decisions affecting public uses (recreational opportunities) on Savage River State Forest are integrated into management decisions that are consistent with the following resource goal as stated in Chapter 1: *“Provide opportunities for the enjoyment of the natural resources on the Forest by making appropriate areas available for resource-based, low impact recreational activities and environmental education programs that are consistent with the resource values of the Forest.”* In addition, recreational opportunities will complement those that are provided within Big Run and New Germany State Parks.

9.2 Current and Future Public Uses

The demand, both nationwide and locally, indicate that outdoor recreational activities such as hiking, horseback riding, wildlife viewing, hunting, fishing, off-road vehicle use, canoeing and kayaking continue to be popular. The public’s pursuit of these activities continues to play a major role in Maryland’s economic growth and tourism industry. Therefore, all future public use proposals will be evaluated based on the resource goal stated above to determine their compatibility with:

- The implementation of sustainable forest management;
- The conservation of wildlife;
- The conservation of plant and animal habitats and other sensitive areas;
- The maintenance of water quality; and
- The protection of cultural resources.

The primary types of public use to be encouraged on the Savage River State Forest include activities such as hunting, trapping, fishing, hiking, birding, nature/wildlife observation, environmental education, and access for canoeing and kayaking. In select cases, minimal development may be undertaken to provide and maintain off-road vehicle trails, mountain bike trails, hiking trails, horseback riding trails and disabled hunter access trails.

9.2.1 Hunting, Trapping and Fishing

Hunting has traditionally been the most common form of outdoor recreation on Savage River State Forest, which continues to be one of the most used public lands for both local and visiting hunters. White-tailed deer is the most popular species hunted on Savage River State Forest and throughout the state. Along with the positive recreational benefits and population management that deer hunting provides, it also provides significant economic benefits to Maryland. A recent survey sponsored by the Association of Fish and Wildlife Agencies found that deer hunting in 2006 generated over \$113 million in retail sales, with a total multiplier effect of over \$190 million contributed to Maryland’s economy. Deer hunting in Maryland supports nearly 2,300 jobs and generates \$71 million in salaries, wages, and business owner’s income, \$15 million in state and local tax revenue, and \$16 million in federal tax revenue.

It is anticipated that the demand for hunting forest game will continue and likely escalate as less private land is available to hunters. Along with this demand for hunting opportunity, it is expected that there will be increased interest in non-hunting use of public land for bird/wildlife watching.

Wildlife populations must be managed to ensure a healthy forest. Therefore, public hunting opportunities will be provided for public enjoyment, while at the same time limiting population growth of some game species and ensuring the protection of the forest and other habitat areas. This plan attempts to identify the proper combination of hunting along with other appropriate recreational use. The forest is open to hunting and fishing in season. Because 96% of the forest is classified as forestland, the forest game group of wildlife species is common throughout the forest. Trapping on portions of the Savage River State Forest for furbearers is permitted through the issuance of a trapping permit.

Upland game birds and mammals are not as common on the forest, but do provide for hunting opportunities. Small populations of eastern cottontail rabbit, bobwhite quail, mourning dove, and American woodcock can be found in recently cutover areas, open land habitats that exist on the forest, or near private agricultural lands adjacent to the forest.

Aquatic habitats located within and surrounding the forest support several species of waterfowl. Open waters include the Savage River and Savage River Reservoir, its tributaries, and several swamps/bogs. Wood ducks and mallards are the most common species.

Hunting with rifles, handguns, shotguns, bows and muzzleloaders are permitted in all designated areas in accordance with state and federal laws. Possession or use of weapons is prohibited in State Forests outside of regular hunting seasons. Target shooting is prohibited except at the rifle range. All game birds and game mammals with open seasons may be hunted. Tree stands or blinds are limited to those of a temporary nature, which must be removed or dismantled at the end of each day. The hunting season in State Forests conforms to standard hunting seasons adopted by state and federal regulations.

A rifle range, located on New Germany Road, provides opportunity to target practice and sighting in firearms prior to the hunting season.

9.2.2 Hiking, Biking, Horseback Riding, Nature Observation and Off Road Vehicles

Although hunting is the most popular activity, there is an extensive forest road system on the Savage River State Forest that offers ample opportunities for hiking, biking, horseback riding and nature observation. These activities will be encouraged on existing roadways provided there are no other user conflicts.

9.2.3 Savage River State Forest Trail System:

The trail system on Savage River State Forest is part of Maryland's effort to make the state trail system second to none. Trail Grants will be utilized to improve the existing network of trails throughout the Savage River Forest trail system. All new trail system proposals as well as maintenance work will be submitted and reviewed through the Annual Work Plan process.

The following is an inventory of existing trails that may be hiked, biked, or backpacked within Savage River State Forest. The trails that may be accessed by ORV use have a special statement in each description. Also, stated in the description is the length of each trail, degree of difficulty, and brief bit of information about the trail.

Meadow Mountain Trail 12 miles - moderate

Originally created for fire control in the forest, this rocky trail fluctuates in elevation. The 4-mile trail section near I-68, also known as East Shale Road, is open for off-road vehicle (ORV) use. The remaining 8-miles, southwest of New Germany Road, is closed to off-road vehicles, except for snowmobiles. This portion of the trail generally follows the crest of Meadow Mountain and provides an excellent view at the Meadow Mountain Overlook. A spur trail (1.5 miles roundtrip) provides access to the overlook.

Monroe Run Trail 6.4 miles - moderate (one-way)

Crumbling bridge abutments are the only remaining evidence that this scenic trail was formerly a connection road built by the Civilian Conservation Corps (CCC) during the 1930s. There are plenty of chances to cool your feet along this trail, which has frequent stream crossings (no bridges!). This trail ends near the Savage River Reservoir in Big Run State Park. To avoid the uphill trek at the end of the trail, begin your hike at the trailhead on New Germany Road. This trail is open only to hikers.

Negro Mountain Trail 8 miles - difficult

Stream crossings and uneven terrain make this trail challenging for hikers and mountain bikers. Winter sports lovers can enjoy adventurous snowmobiling on this trail.

Big Savage Trail 17 miles - difficult

This popular backpacking trail will lead you through upland forests of oak and hickory, old farmsteads planted in pine and rocky terrain blanketed by wild azalea and rhododendron. At High Rock you will find the remnants of an old fire tower lookout cabin. Before lacing up your hiking boots, please plan ahead. There are few reliable water sources on this trail, so pack plenty of water. This trail is open only to hikers.

Margraff Trails 7.5 miles - moderate

A series of circuit, gravel roads provide less technical hiking and mountain biking opportunities, while more advanced cyclists can test their skills on the area's abundant and challenging single track trails. With an elevation of 2,800 feet, visitors enjoy splendid views year round. Sections of this trail system are also open for snowmobile use.

Mt. Aetna Tract Trails 7.6 miles - moderate

A detailed pocket guide is available at the forest headquarters for this scenic 700-acre area. Diverse loop trails offer opportunities for bird watching, mountain biking and hiking. A winter of heavy snowfall supports snowshoeing and cross-country skiing activities.

Asa Durst Trails 4.5 miles - moderate

Along the trail you will observe stands of pine and spruce, stream valleys rimmed in rhododendron, and upland hardwood forests that have reclaimed former pastures and farmlands. For those looking to get away from more heavily used trails at New Germany in

the winter, we recommend a visit to this area for a backcountry snowshoe or cross-country ski experience.

Backpacker Loop 24 miles - moderate

Plan a multi-day backpacking trip by connecting a series of trails and forest roads that include designated primitive campsites. The loop begins or ends at New Germany State Park, using Meadow Mountain Trail, Monroe Run Trail, Savage River Road and Poplar Lick Trail. Stop by the forest headquarters to receive a backcountry permit before starting your trip.

Poplar Lick Trail 6 miles - moderate

The foot bed of this trail is a forested dirt/rock road, which begins at New Germany Road and ends at the Savage River Road, is the remainder of a CCC roadway constructed in 1934. Visitors in July are rewarded with rhododendron blooms and colorful wildflowers. The trail has 13 stream crossings, but only five bridges - so be prepared to get your feet wet when hiking or biking. This trail is not recommended for typical passenger vehicles, but is open to MVA licensed 4-wheel drive vehicles and ATVs. A \$15 permit is required for ATVs. This trail fords Poplar Lick Run which is a native brook trout stream several times and has been studied as part of DNR's Off-Road Vehicle Trail Assessment and Report and is consequently scheduled for closure to motorized traffic.

New Germany Trails 10 miles - easy to difficult

Groomed ski trails offer cross-country skiers a chance to experience the forest in the beauty of a Garrett County winter. This picturesque circuit trail system is also popular year-round for hiking and mountain biking.

Camping

There are currently 72 designated primitive campsites within Savage River State Forest. These sites are all spread out around the state forest. The areas with primitive camping include Big Run Road, Savage River Road, Westernport Road (Elk Lick), Blue Lick Road, Poplar Lick ORV Trail, and Whitewater sites just down from Dry Run road. These are designated camping areas but the entire forest is open to backcountry backpacking and camping trips. You must acquire a backcountry pass from the state forest office before heading out on one of these adventures.

9.2.4 Savage River State Forest Off Road Vehicle (ORV) Trail:

East Shale Road 4 miles

The four mile trail section (of Meadow Mountain Trail) near I-68, also known as East Shale Road, is open for off-road vehicle (ORV) use.

Poplar Lick Trail 6 miles

This six mile trail was open for off-road use but is now open to only foot traffic.

Over recent years, the importance and management of certain natural communities on our State Forest have become more clearly defined on the landscape. The Department is mandated under both the ORV regulation and the Annotated Code to protect any known "unique" natural areas. Title 5-209 states: *no off-road vehicle may be permitted where its operation will damage the wildland character of the property,*

Regulation 08.01.03.10.C, states:

(1) *The Department shall locate ORV trails to minimize:*

(b) *Damage to soil, watershed, vegetation, or other resources;*

(2) *The Department may not locate ORV trails in:*

(e) *Areas possessing unique natural, wildlife, historic, or recreational values as determined by the Department.*

- Impacts from ORV use on Public Lands is currently being assessed by the Department, results from this assessment will become public in 2011.

9.2.5 Water Access for Canoeing, Kayaking

The Savage River and the Savage River Reservoir offer opportunities for canoeing, kayaking and fishing. For the experienced boater, the river offers white water opportunities in the spring and when water is occasionally released from the reservoir. The reservoir offers flat-water boating for the novice or experienced canoeist. Only boats with electric motors can be used on the reservoir – no gasoline engines are permitted.

9.3 Education and Public Outreach

A Department goal for Savage River State Forest is that, in addition to increasing the public's awareness concerning the importance of sustainable forest management and its connection to the health of the Chesapeake Bay, it will be a national model of sustainable forest management. The Forest is seen as a "living laboratory" or "outdoor classroom" where resource professionals and the public can learn. Therefore, education and the development of forest management demonstration areas will be very important. This goal will be achieved by:

- The continuation and constant update of the Savage River State Forest website;
- The development of brochures and other written material about the Forest; and
- The provision of tours and other public forums for educating the public about the Forest.

Savage River State Forest Website

The website <http://www.dnr.state.md.us/publiclands/western/savageriverforest.asp> has been and will continue to be an invaluable mechanism for communicating with the public. It has been used to share general information and annual work plan (AWP) projects. Its future value is dependent on the Department's ability to continually update the information.

9.3.1 Educational Material

The Department is considering the placement of interpretive markers or informational kiosks at the public use areas experiencing the highest visitation. These kiosks would include a map and information on the Forest and sustainable forest management. The Department annually updates its educational trail guide by developing information emphasizing sustainable forest management. The Department should also consider the development of a CD-ROM that contains information about the forest, its resources and the connection to the Bay. This could be a cooperative effort between the Forest Service, the Wildlife and Heritage Service and the Park Service.

9.3.2 Tours and Forums

The Department should sponsor forest management field days that educate the public in the values of sustainable forest management and working landscapes. These field days could

educate the public about the Department's approach to forest management and the relationship between their use of the forest and forest management. The Department will continue to sponsor cooperative research projects as part of the implementation of the Monitoring Plan (see Chapter 10). Possible partners could include universities such as Frostburg State University, West Virginia University and the University of Maryland – Appalachian Laboratory, private non-profit organizations like the Chesapeake Bay Foundation and local community service organizations. In addition, the Department should involve the Maryland Conservation Corps, local school groups, scouting organizations and local environmental groups in the implementation of projects identified in the Annual Work Plan (AWP).

9.4 Implementation

As with the other management activities, recreational and educational activities will be included as proposals within the Annual Work Plan (AWP). These activities will be reviewed by the Savage River State Forest interdisciplinary team and once reviewed and approved will be implemented as part of the AWP process. Public use activities will also be monitored to ensure there is not conflict with the other management goals or degradation of the sensitive resources found on the forest. Limits of Acceptable Change procedures and protocols will be used to monitor these public use activities (see Monitoring Plan – Chapter 10).

Chapter - 10

Savage River State Forest Monitoring Plan

10.1 Introduction

The primary goal of the Savage River State Forest is to provide sustainable natural resources, such as fresh water, fish and wildlife habitat, timber products and to provide education and recreation opportunities while contributing to the environment and local economy. Concepts of sustainability are based on the international standards of sustainable forestry represented by the Montreal Process Criteria and Indicators http://www.rinya.maff.go.jp/mpci/whatis_e.html. Maryland DNR participates in the National Roundtable for Sustainable Forests to further improve coordination and use of sustainable forestry practices <http://www.sustainableforests.net/> Critical sustainability standards for this Forest includes no soil deterioration or nutrient loss, no decline in water quality from activities, no loss or decline of species, the protection of special areas, an acceptable flow of jobs and revenue, and stakeholder satisfaction with results.

Monitoring is crucial to the ability of the Savage River State Forest (SRSF) to supply its intended sustained yield of a variety of forest resource benefits. At a minimum, the monitoring activities must meet current requirements for certification and reporting. Monitoring is necessary to document sustainable practices, provide information to adapt management, and carry out elements required for certification as a sustainable forest by the Sustainable Forestry Initiative (SFI) and Forest Stewardship Council (FSC). The FSC specifically identifies monitoring and assessment as one of its ten principles, and monitoring data is needed to meet a number of SFI Core Indicators. Evaluation of the range of elements being sustained relies on an interdisciplinary plan that monitors a wide range of aquatic and terrestrial features. A monitoring project on this scale provides opportunities for scientific study, collaboration, and external funding. It also provides challenges, such as the need for an efficient, coordinating structure for the monitoring program and how to overcome limits to the involvement of current staff in the project. This critical component of the Savage River State Forest Plan will not be successful unless support continues to be adequate, whether financed by Forest income or other sources.

On Savage River State Forest (SRSF) we have begun to implement stand level data collection and analysis for the entire forest. The last Continuous Forest Inventory (CFI) was completed in 2002.

10.2 Monitoring Plan

The monitoring plan supports the needs of the Savage River State Forest Project using a multi-tiered approach:

- Tier I: a landscape-scale inventory
- Tier II: a stand/compartiment-level inventory, and
- Tier III: project-specific assessment and research.

In order to more efficiently use resources, data collection is coordinated as much as possible, among the different staffing units. The exact number of points to be sampled will depend on the number of points falling within multiple strata, and potentially on the cost/effort for sampling. Power analysis and community dynamics models will be used to help determine the appropriate number of samples, allowing trends in population changes to be detected. At the beginning of each section, the SFI Objectives and FSC Principles that are addressed by these elements of the monitoring plan are listed, with text descriptions supplied in Appendix B & C.

Data obtained from the monitoring will be used to update the Savage River State Forest's Geographic Information System, and spatially integrated with the base ownership layer. DNR units and personnel have been assigned to manage the layers of information based on data source and unit expertise, including Forest Service, Wildlife & Heritage Service, Land Acquisition & Planning, Ecosystem Restoration Services, and Information Technology. New data is added to the GIS system through the data manager assigned for the respective layers.

10.3 Tier I: Landscape-scale, Long-term Monitoring

10.3.1 Objectives

The focus of Tier I monitoring is overall biodiversity and ecosystem health. It provides the basic inventory data for forest management, sensitive resources, and water quality over terrestrial and hydrogeomorphic regions. Tier I monitoring provides the information base for Sustainable Forestry Initiative certification Objectives 1, 3, 4, 5, and 6, and for Forest Stewardship Council certification Principles 5, 6, 7, 8, 9, 10 (Objectives and Principles listed in Appendix B & C). The CFI data was completed in 2002. Stand level data collection was begun in the fall of 2009. Data layers inventoried include:

- 1) Forest overstory condition, including stand inventory, tree growth rates, and regeneration status, yielding information needed to determine sustainable levels of harvesting;
- 2) Forest understory condition, including height of canopy layers, species, diversity, and presence of invasive species;
- 3) Wildlife and habitat information, habitat features like snags, woody debris, stand size class, percent canopy, and vertical diversity; and
- 4) Water quality surveys of nutrient status, macro invertebrate populations, and aquatic habitat condition that supplement the Maryland Biological Stream Survey data, supplying water quality status and aquatic invertebrate species presence and diversity.

The inventory sampling approach assures representation of sensitive resource areas, ecologically significant areas, and riparian areas. Special area boundaries including sensitive species protection and restoration areas and cultural resources such as ruins, graveyards, research plots, or wells have been added to the GIS system as encountered or sought out. Inventories are scheduled for update every 10 years.

The definition of sustainability given above for the publicly owned Savage River State Forest included stakeholder satisfaction with results. Existing processes, including public meetings on annual work plans, interdisciplinary team for management review, and the Citizens Advisory Committee, all provide outlets for expression of stakeholder views. Information is provided on the DNR website, <http://www.dnr.state.md.us/publiclands/western/savageriverforest.asp>, including the current management plan and annual work plans. These information sources will

be used at a minimum to estimate stakeholder satisfaction. Independent survey of known stakeholders may be undertaken if outside funding and partners are secured.

10.3.2 Methods Overview

Strata for sampling were chosen for major factors of interest and to control for known variation. Stream and water quality sampling are organized around the geomorphic region and the stream network, while terrestrial sampling uses strata based on forest type and habitat for sensitive resources (Table 10.3.2.1). Geomorphic regions split out areas based on underlying geology and topographic characteristics, which usually control major differences in stream chemistry (e.g., acid or alkaline, base levels of nutrients). The stream network is stratified on position relative to State ownership, and will correspond partially to stream order; streams originating entirely in State land are likely to be smaller (first, second, or third order), while streams passing through or bordering State lands are likely to be larger (third order or higher). Terrestrial strata focus on major stand types and areas with rare species and natural communities, most of which are already defined and available in digital form, since these two criteria have the greatest effect on management actions undertaken. The information base for the sampling is the Savage River State Forest GIS system.

Table 10.3.2.1: Strata for Long-term Monitoring on Savage River State Forest

Stream and Water Quality Sampling		Terrestrial Vegetation and Species Sampling	
<i>Geomorphic Region</i>	<i>Stream Location</i>	<i>Forest Composition</i>	<i>Sensitive Resources</i>
Surficial Confined	Originates in State Forest	Pine	Owls
Fine-grained Lowland	Passes through SRSF	Upland Hardwood	Forest Interior Dwelling Species & High Conservation Value Forest
Well-drained Upland	Passes through SRSF	Bottomland Hardwood	Ecologically Significant Areas & High Conservation Value Forest
Poorly Drained Upland		Mixed Pine-Hardwood	Riparian/Wetland Areas,
Poorly Drained Lowland			

10.3.3 Terrestrial Vegetation and Species Sampling

Vegetation structure and composition will be quantified using methods and protocol from Silvah-Oak. Plots are systematically sampled from a random grid overlaying the management unit. In addition, percent ground cover, tree regeneration, coarse woody debris, forest health indicators, and data for invasive species, shrubs, and herbaceous plants will be collected. Data summaries for forest overstory include tree volume, number of trees, basal area, density, and growth rates. All permanent sample points are expected to be sampled at least once every 10 years. In order to ensure that there are adequate samples to examine trends in the data, a minimum of 20 plots were assured for the less common strata like Ecologically Significant Areas.

To gather detailed data on bird and reptile/amphibian abundance and habitat features, a subset of sensitive resource plots will be selected for additional data collection using multiple visits from spring to late summer to adequately sample seasonally available populations. Calculations for wildlife information will include diversity indices, relative frequency, and relative abundance. Multivariate analyses are used to determine relationships between stand types, age classes, and stand history and observed population characteristics. Vegetation information from the detailed

wildlife habitat subset of plots may be analyzed using detrended correspondence analysis techniques to identify community types and other associations.

Living organisms will be monitored with emphasis on sensitive species or indicators of ecosystem functions, including forest interior dwelling and other birds, reptiles, and amphibians. Standard methods include constrained time searches, pitfall traps, and call counts, tailored to the habits of target species.

10.3.4 Stream and Water Quality Sampling, Procedures, and Progress

For aquatic samples, points are chosen using stratified random sampling from mapped (“blue-line”) stream sections that are 150 m in length. Streams must traverse a minimum of 1000 feet on a SRSF parcel. These stream sampling points are re-randomized for each sampling event (at least every five years) in order to more accurately capture the general condition of the aquatic resources.

Water quality monitoring will use procedures outlined in Boward and Friedman (2000) or current Maryland Biological Stream Survey sampling methods. Water samples are collected during base flow at all sites with water, standing or free flowing in a defined channel, avoiding the 24-hour period following a minimum of 0.5” of rain. Sampling includes flow (L/s), water temperature (°C), dissolved oxygen (mg/L), pH, and conductivity measurements at each site using field instruments (e.g., Hydrolab Surveyor II). Grab samples of whole water are collected just below the water surface at mid-stream and filtered in the field (0.45: pore size Gelman GF/C filter). To allow for analysis of nitrogen species, the samples are stored on ice and frozen the day of collection for later lab analysis. Analysis includes dissolved inorganic nitrogen (mg N/L of NO³, NO², NH⁴) and dissolved inorganic phosphorus (mg P/L PO⁴). All analyses are conducted in accordance with US EPA protocols.

Aquatic benthic macro invertebrates are collected using methods developed for mid-Atlantic coastal plain streams that are compatible with and comparable to Maryland Biological Stream Survey (MBSS) sampling protocols (Kayzak, 2001). Samples are collected only from free-flowing streams, avoiding inaccuracies associated with evaluating standing pools. Sample processing is done according to MBSS guidelines (Boward and Friedman, 2000). Habitat assessments based on US EPA methods for low gradient streams (Barbour et al., 1999) are completed at all macro invertebrate stations. Summary measures include the Benthic Macro invertebrate Index of Biotic Integrity, Habitat score, and percent of suitable habitat.

10.4 Tier II: Stand/Compartment-level Medium-term Monitoring

10.4.1 Objectives

This level of monitoring is used to give more specific information on:

- 1) Occurrence and management needs for rare, threatened, or endangered species, or natural communities,
- 2) Areas where invasive species threaten populations of rare species,
- 3) Stands or compartments where more information is needed to support high production of wood fiber or other marketable product, or
- 4) Other species or areas of interest that occur across several stands.

Emphasis will be placed on sites that need to be protected, enhanced, or restored to maintain healthy native communities. Factors assessed at this scale include water quality and sensitive resources, including species presence, richness, and diversity. In areas identified for high production of wood fiber or other marketable forest products, more frequent and more intensive forest stand data may be needed to inform management options. These monitoring activities will occur more frequently and in focused areas compared to Tier I monitoring. Tier II monitoring supplies information needed to carry out or document SFI Objectives 1, 3, 4, 6, and 8, and FSC Principles 5, 6, 7, 8, 9, 10.

Forest communities of interest on the Savage River State Forest include: red pine, white pine and Norway spruce plantations. Overstory and regeneration will be monitored to determine that these less abundant pine types are being maintained in the current stands or other areas with suitable habitat. Monitoring of regeneration is designed to allow diagnosis of threats to maintaining these conifer forest communities, and to allow management actions to be taken to increase abundance prior to loss of parent trees. Other natural communities of interest with monitoring needs related to management and protection include: hemlock stands, old growth and nearly old growth forests, and other High Conservation Value Forests.

10.4.2 Methods Overview

Sample points for sensitive resources will be selected using random sampling or, when necessary, stratified random sampling. Cluster sampling may be used for rare plants. For forest stand condition, systematic grid sampling will be used for greatest efficiency, avoiding lining up the grid with obvious landscape patterns (streams or ridges) to preclude bias in sampling. Data collection will occur more frequently than in Tier I monitoring, with the timing dependent on the organisms/habitat features to be monitored. This monitoring may be ongoing or of limited duration.

Standard methods available in federal or state manuals or published peer-reviewed research will be used to collect data for:

- Water quality indicators such as stream nutrient export, wetland condition, fish and aquatic macro invertebrate assemblages;
- Forest stand condition indicators such as vegetation structure and composition, invasive species, natural plant communities, insect and disease impacts, fuel loading, and stand density;
- Rare, threatened, and endangered species presence, diversity, and abundance; and
- Presence of invasive species that threaten the survival of rare, threatened, or endangered species;
- Natural community diversity metrics; and
- Other indicators of ecosystem recovery and function.

Impacts from trails including both hiking and All-Terrain Vehicle (ATV) routes, can be monitored in specific areas of concern using standard limits of acceptable change (LAC) procedures (Stankey et al., 1985; McCool and Cole, 1998) and procedures developed specifically to assess trail impacts (Marion and Leung, 2001). Methods to monitor populations of rare, threatened, and endangered species in Ecologically Significant Areas and other areas of interest will depend on the organisms of interest. Protocols will generally follow standardized methods presented in Tier I. Power analyses will be used to help determine the appropriate number of

samples to allow a trend to be detected. Unique natural communities will be monitored using standard plot methods for community classification. Forest stand information may include data for stand-level growth and yield modeling, soil sampling, and overstory and understory composition.

10.4.3 Invasive Species

Information on general occurrence of invasive plants will be captured in the Tier I inventory, and updated on the same cycle as that inventory. More intensive monitoring and control will be targeted to those areas where they might compromise the health and survival of rare, threatened, or endangered species or natural communities. Invasive species control plans will be developed in conjunction with rare species protection and restoration plans. Control plans will include actions to prevent or minimize re-infestation of problem species, such as when management operations are in adjacent areas. Control options will be tailored to the situation and species, and may include physical, chemical, or biological controls. The spread of invasive plant species will also be minimized as much as possible through Best Management Practices for timber harvest and other management activities.

Problematic invasive species are sometimes identified in routine field operations, outside of rare species habitat. In these cases, staff will determine the potential to interfere with the survival, health, or regeneration of native forest stands. Where the invasive species is a significant detriment, a management strategy for control will be developed and included in the annual work plan review. Chemical control is anticipated in many settings because of the general effectiveness and cost-efficiency, although any effective option including physical or biological control will be considered. Species that have potential to interfere greatly with forest health and regeneration include multi-flora rose, mile-a-minute, and Japanese stiltgrass among others.

10.5 Tier III: Management Activity-based Short-term Monitoring

10.5.1 Objectives

Monitoring at the Tier III level measures responses to management activities at a finer scale, including silvicultural treatments, restoration projects, and public uses that may affect a portion of a stand or the whole stand. This level of monitoring includes updates of stand-level information to reflect recent management actions and some focused scientific studies, with monitoring occurring on both control and experimental areas before and after the manipulation. Measurement and monitoring of soil quality, water quality, and species presence, richness, and diversity allow us to monitor these indicators of sustainability from the Sustainable Forest Management Plan for the Savage River State Forest Project over the long term. Tier III monitoring is needed to document compliance with SFI Objectives 1, 2, 3, 4, and 6 and FSC Principles 5, 6, 7, 8, 9, and 10 (Appendix B & C).

10.5.2 Methods Overview

Sample plots are chosen randomly or systematically within appropriate control (reference) and experimental areas (areas to be manipulated). Where possible, at least three replicates are sampled for each type, with more than one sample taken in each plot. Potential experimental area treatments include prescribed burns, herbicide applications, harvest systems and practices, watershed restoration and improvement projects, and ESA restoration activities. Measurements of stand health, biodiversity, productivity, soil fertility, water quality, and species-specific responses are most appropriate for this level of monitoring.

10.6 Procedures by Forest Management Actions

Harvesting (For SFI Objectives 2, 3, 4, 5, 6):

All thinning and regeneration harvest operations are checked for compliance with Best Management Practices (BMP). Harvest Site Review checklist items include, haul roads\skid trails & landings, streamside management zones (SMZ) & stream crossings, safety BMPs, and Aesthetics.

The harvest area selection process occurs through Interdisciplinary Team and Citizen's Advisory Committee review, based on an Annual Work Plan recommended activity list generated by the forest manager. Stands are selected based on age, stocking levels and species composition. Consideration is given to size of the area to be harvested and its proximity to stands less than five years of age. Currently, most silvicultural prescriptions in mixed oak stands are being managed to ensure a sustainable oak component. Silvicultural prescriptions may be modified based on the following:

- Presence of rare species, Wetlands of Special State Concern, Threatened and Endangered species (state and federal) (existing database and some field checks);
- Stream buffers (identified and flagged in the field);
- Cultural sites (e.g., graveyards, ruins);
- Presence or absence of advanced regeneration (i.e., whether suitable for natural regeneration, planting, or direct seeding).

10.6.1 Site Preparation

Natural regeneration is considered as the first option, so advanced regeneration is evaluated (plot counts to estimate seedlings/acre, with attention to distribution over harvest area). Site preparation methods considered by the Interdisciplinary Team for the Annual Work Plan review include but are not limited to, prescribed burning, herbicide application, and mechanical treatment.

10.6.2 Prescribed Burning

Prescribed burning is recommended for site preparation or after thinning to control understory vegetation and encourage regeneration of desirable native plants. Procedures for establishing the prescription for a burn include evaluating the site for fuel load, ability to carry a burn, locations of fire breaks, and potential hazards of smoke to surrounding locations (e.g., well-traveled roads, confined livestock, neighbors). Prescribed burn plans are prepared by MD DNR fire staff, using guidance from "A Guide to Prescribed Fire in Southern Forests" (1989, USDA FS National Wildfire Coordinating Group publication PMS 431-2). MD DNR fire personnel evaluate all sites after burning to determine if the burn met the stated objectives. MD DNR Heritage staff specialists evaluate selected sites with high potential for rare species for presence and abundance of target species following burn treatment. On the Savage River State Forest, understory burning to enhance oak regeneration is planned. Regeneration monitoring will be used to evaluate the level of success of this practice and identify factors to improve regeneration.

10.6.3 Herbicide Application

The use of herbicides is being minimized on Savage River State Forest, but there are instances where their use is appropriate to effectively shape the stand to its desired condition for forest products and/or habitat with minimal impact to soils. Herbicides are applied according to label

restrictions, with spray buffers around flowing streams or open water. Application is most commonly done by broadcast sprayers mounted on tracked units with backpack application used where spot spraying is the only need. Oak species tend to be more resistant than other hardwoods, such as red maple to a commonly used herbicide such as Arsenal AC at reduced rates. While red maple is a native species, the lack of wildfire has allowed their density and frequency to greatly increase at the expense of other hardwoods, and they lack the mast that is a winter staple for wildlife. Monitoring of regeneration density and type will allow evaluation of current practices in developing the desired mix of stand types. Trials of reduced herbicide rates will be tested on Savage River State Forest.

10.6.4 Mechanical Treatment

Mechanical site preparation is rarely used in Savage River State Forest, but when used, it usually involves heavy equipment such as a bulldozer, which may be augmented by lighter equipment such as chain saws or brush saws. Riparian buffers are flagged in the field to assure that machinery does not affect water bodies and no delivery routes for sediment are established during the operation. Excessive rutting and soil compaction are avoided as required in Maryland Forest Harvesting BMPs, and are monitored through the use of the Harvest Site Review form.

10.6.5 Intermediate Operations

Commercial and pre-commercial thinning is planned for the Savage River State Forest. The same procedures as outlined for harvesting are followed, regarding site review, modification of operation for rare or sensitive species, and BMP compliance. Fertilization is not typically practiced, but soil tests for nitrogen, phosphorus, and pH before and after application will be used if application is needed. Five years after the intermediate operation the stand will be re-examined to determine the efficacy of the treatment.

10.6.6 Special Area Projects for Water Quality

Some additional restoration projects may be undertaken for water quality and wildlife objectives. Watershed improvement projects will be chosen in locations where slowing water could improve nutrient and sediment levels in water leaving Savage River State Forest. Projects require at least two critical elements: 1) waterway and topography where water can be slowed and backed up to increase residence time without adversely affecting neighboring lands, and 2) source of nutrients or sediment, such as from agricultural lands (rates from forest lands are already low). Monitoring includes pre-project baseline information and post-project assessment of water quality and vegetation.

Habitat Improvement Projects are chosen in areas with great potential to support rare species or natural community types. Maryland Natural Heritage Program is developing management plans for selected areas, and restoration projects will be implemented as part of the annual work plan. Projects include clearing trees in areas where rare species depend on more open conditions, disturbance to mimic natural process, prescribed burning and restoring hydrology where past drainage has reduced extent of wetland habitat. Presence and extent of rare species or appropriate indicators will be recorded before and after projects.

10.6.7 Special Area Projects for Wildlife & Heritage

Portions of Savage River State Forest lands are being surveyed annually for bird presence through statewide and regional count programs. These bird counts are added to other regional

and national data. Other projects are periodically proposed to increase game and fisheries habitat, these projects are often done in conjunction with local college and universities.

10.6.8 Public Use and Recreational Activity

Hunting is permitted on Savage River State Forest. For land open to public hunting, monitoring consists of periodic roadside vehicle counts during hunting season. The annual harvest report includes estimates for harvest by species: white-tailed deer, turkey, dove, quail, squirrel and rabbit. Public use data will be collected via checklist surveys, permit applications, and other quantitative methods comparable to those used by the USDA Forest Service, US Fish and Wildlife National Refuge System, and Maryland DNR Wildlife and Heritage Service.

Other recreational activities (such as trail use for horseback riding, bird watching, or hiking) are monitored through use agreements outlining terms and conditions of use for organized for-profit groups. Ongoing survey efforts such as the national surveys for fishing and hunting and county recreational surveys will be used as additional information sources and for context to allow comparisons of patterns of use on Savage River State Forest. Other methods such as online user forms and honor system use survey boxes will be used as time, resources, and departmental approval permit. As stated earlier, impacts to use areas may be monitored using limits of acceptable change (LAC) protocols, provided funding is available (Stankey et al., 1985; McCool and Cole, 1998).

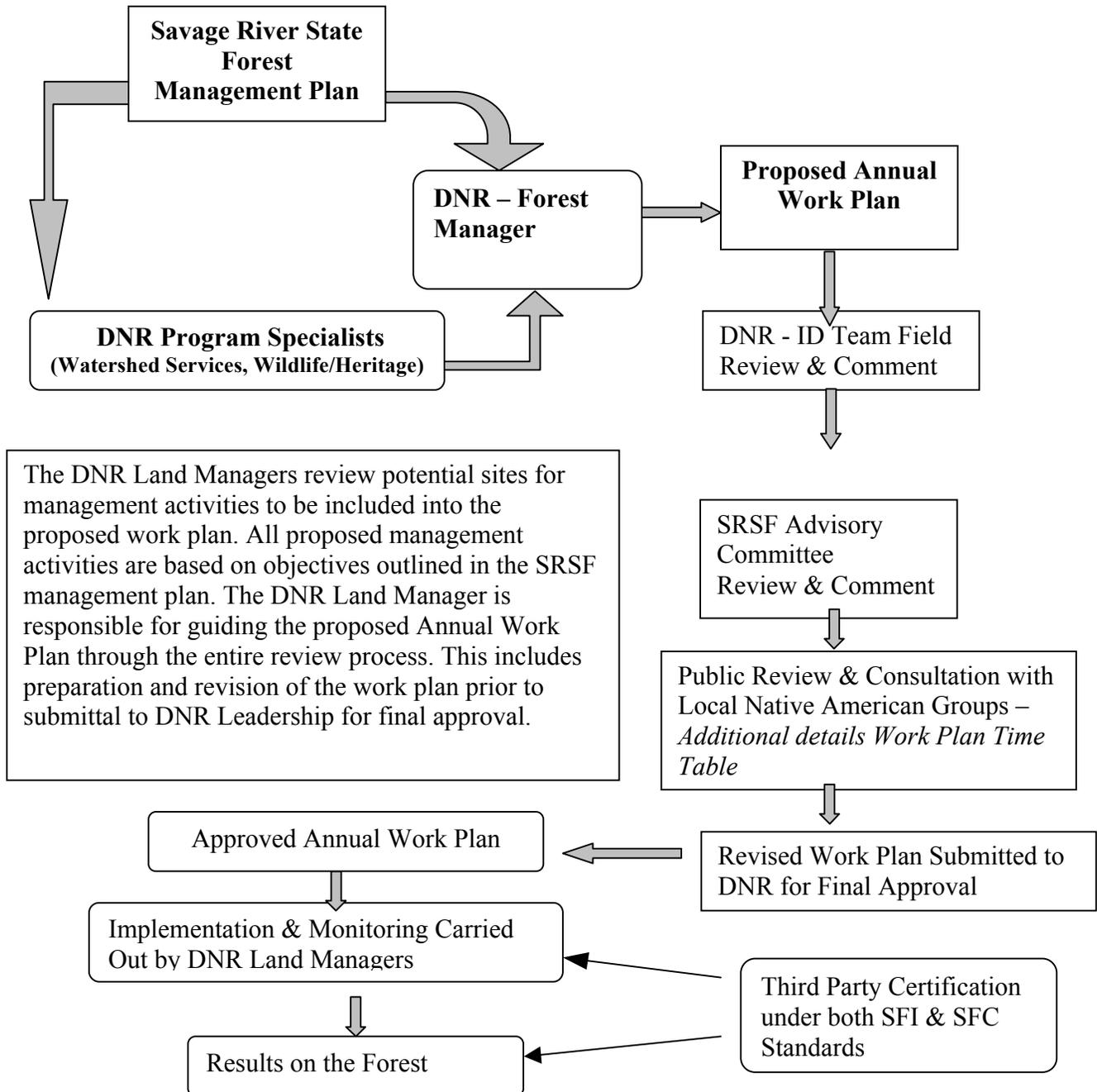
CHAPTER 11

Savage River State Forest Annual Work Plan - Process

11.1 Annual Work Plan

The Annual Work Plan (AWP) will be the controlling document to assure that the Land Manager is effectively carrying out the sustainable management plan for the land, and that the Department is fully informed and supportive of the management actions planned and taken. The Savage River State Forest Manager is responsible for preparation of the Annual Work Plan.

Figure 11.1: Annual Work Plan Development Process



The concept of an annual work plan that establishes the land management program for an entire year is an important key to successful implementation of sustainable forest management on Savage River State Forest. It will be the responsibility of the DNR State Forest Manager to oversee day to day operations on Savage River State Forest and the implementation of each Annual Work Plan. The amount of work that needs to be done, means that the State Land Manager must be able to plan and schedule work well ahead of time, arrange for sub-contractors, and be ready to move rapidly when weather and soil conditions are favorable. This will be accomplished through a well defined and detailed annual work plan that will plan out forest management and restoration projects over a year in advance of the actual work.

Figure 11.1 shows how achieving desirable on-the-ground results, which are the key outcomes of the annual work plans, requires the cooperation of a variety of players. Several parties are involved in the process all with key roles, but the persons central to all implementation, monitoring and reporting are the Land Managers. In this process, the lines of responsibility essential for success are clearly defined. The Land Managers are responsible for implementing the Annual Work Plan in a manner that is both environmentally and fiscally responsible.

Once implementation is underway, the ongoing process of carrying out forest management activities will result in changes in on-the-land conditions, as well as new information gathered. The on-ground results will be verified by a third party certification process, which will be conducted through surveillance audits each year. Certification is done to compare the achieved results with the planned outcomes of the management prescriptions contained in this plan and the Annual Work Plans. The independent third party auditors will report their findings to the Land Managers. Where field or operational deficiencies are noted, it will be the responsibility of the Land Managers to correct them. Any deficiencies identified in the management plan or its goals, will be addressed by Maryland DNR. The audit report, and any subsequent actions taken, will be available to the public.

Implementing the Savage River State Forest plan involves adaptive management, where research and monitoring are given a high priority, and new information is constantly gathered to feed back into the basic data management system and all future plans. The Land Managers are responsible for reporting key findings as well as maintaining a constantly-updated data management system that is always available for making forecasts, guiding management decisions, and providing a current information base that can support plan reviews or amendments in the future.

11.2 Annual Work Plan Time Table

Annual Work Plan (AWP) development along with the necessary environmental and regulatory reviews will strive to adhere to the following process/time lines:

1. The DNR Land Managers begin fieldwork to review sites to be included in the next annual work plan from November through March.
2. The DNR Land Manager drafts a proposed work plan and sends it for ID Team review by July 1.
3. The DNR – ID Team reviews the proposed plan, a field review of proposed

activities in the work plan is scheduled and comments returned to the DNR Land Manager at least two weeks before the scheduled ID Team field review.

4. The DNR Land Manager presents the proposed work plan to the Savage River State Forest Citizens Advisory Committee for comment and review by December 1.
5. This above process includes consultation/review with local Native American Groups and the Maryland Commission on Indian Affairs concerning potential sites of special cultural, ecological, economic, or religious significance.
6. The DNR Land Manager reacts to needed changes and submits a revised plan to DNR Headquarters by January 1.
7. The final step is the AWP will be posted on the DNR webpage for a 30-day public comment period, to be completed no later than March 1.
8. The DNR Headquarters obtains final official approval of the Annual Work Plan, as revised, by June 1.
9. The Land Managers begin implementing the approved Work Plan July 1.
10. Independent Third-Party Auditing for forest certification begins after the year ends and is repeated every 3-5 years, depending on certification requirements.

11.3 Contents of the Annual Work Plan will include:

Forest Overview

Includes an overview of the forest; history, size, location, special features, etc.

AWP summary

Includes number of sales, total harvest acres, acres by harvest method, estimated harvest volume and other important features of the work to be performed during the next year.

Maintenance Projects

Includes boundary maintenance, road maintenance, building maintenance and other such projects.

Recreation Projects

Includes projects such as campsite improvements, hunting programs, special recreational activities, ATV and hiking trail maintenance, trail grants, signage, and other projects specific to recreational users of the forest.

Special Projects

Includes activities to gain or maintain third party forest certification, GIS databases, and other such activities.

Silvicultural Projects

Includes forest harvesting, prescribed fire programs, fertilization, reforestation, and other such projects. This section must include the following:

Final Silvicultural Activities:

1. Site Map

2. Silvicultural Prescription
3. Stand Data

Review Process:

1. Review Summary
2. Interdisciplinary Team Comments (collective)
3. Advisory Committee Comments
4. Public Comments

G. Watershed Improvement Projects

Includes special projects to enhance water quality, wetland restoration, and other such activities.

H. Ecosystem Restoration Projects

Includes projects to manage exotic invasive species, efforts to restore shale barrens or other natural habitats, and other such activities aimed at improving ecosystems.

I. Monitoring Projects

Includes CFI forest inventories, and other inventory projects being conducted on the forest, watershed monitoring, and other such projects.

J. Budget

Includes a proposed budget specific to the forest.

The Land Managers will be responsible for overseeing all activities to insure the desired environmental and silvicultural result, while maintaining cost effectiveness and targeted economic returns.

CHAPTER 12

Operational Management

12.1 Introduction

This section of the plan is designed to cover the annual cost and revenues associated with the operational management of Savage River State Forest. It is the Department's intent that most of the revenues generated from the SRSF will be used to pay for the management and operation of the Forest. As stated in Chapter 1 of this plan, "*The primary goal of the Savage River State Forest Sustainable Management Plan is to demonstrate that an environmentally sound, sustainably managed forest can contribute to local and regional economies while at the same time protecting significant or unique natural communities and elements of biological diversity.*"

The numbers expressed in this section are only estimates and averages of annual expenses and revenues. These numbers will fluctuate each year based on management prescriptions, economic conditions and public use of the forest.

The following information is a breakdown on Revenues and Operational costs associated with the Savage River Forest. These figures are only estimates that are based on projected revenues and operational expenses. Yearly changes in the timber markets and weather conditions can severely affect revenues. Operational expenses will vary from year to year, mainly based on costs associated with proposed restoration projects. For many watershed restoration projects other sources of revenues, such as matching grants, will be sought to help offset the cost to the Department.

12.2 Savage River State Forest Revenue

Estimated: \$300,000 to \$400,000

Revenues that are generated from the Savage River Forest are deposited into the Department's Forest Reserve Fund. In order to cover expenses out of this Fund, a Savage River State Forest Budget must be developed a year in advance as part of the larger DNR budget. It then goes through the legislative approval/review process along with all other state operating budgets. Once adopted, the budget goes into effect the first day of the fiscal year (July 1st).

Forest Product Sale Revenue: This revenue is generated from the sale of forest products, which are identified in the Annual Work Plan. Traditional forest products include pulpwood and sawtimber from thinnings and regeneration harvests. This revenue is tied to forest harvest activities identified in the annual work plan and will vary each year.

12.3 Operational Cost

Estimated total Annual Expenses: \$565,503

Operational expenses are those costs paid directly out of Savage River State Forest Revenues by the State Forest Manager. These cost are only estimates and will vary each year, some of these cost are tied directly to the amount of revenues generated each year.

13.3.1 Staffing Cost

Estimated: \$350,000

This cost is associated with Departmental contractual staffing and State Personnel classified salaries. This staff is responsible for developing annual work plans, managing the daily activities

on the forest, including boundary line work, road and gate repairs, recreational activities such as the public hunting programs and implementing all restoration projects.

12.3.2 Land Operation Cost

Estimated: \$100,726

This includes expenses for office and field equipment, vehicles, gates, gravel, signs, boundary paint, roadwork contracts and construction, trash removal from illegal dumping, boundary line work & surveying, tree planting, site preparation, control of invasive species, pre-commercial thinning and other forest management practices. Some of these costs will vary greatly from year to year based on the activities identified in the Annual Work Plan.

12.3.3 Forest Certification, Inventory & Monitoring Program

Estimated: \$ 5,000

This estimate reflects the annual cost of various on-going research projects on the forest. Expenses are directly tied to the Savage River Forest Monitoring Plan and Forest Certification. The purpose of forest monitoring is to accurately evaluate forest health and the effects of specific management activities. Resource managers will use the information to make informed future management decisions (i.e. adaptive management). Cost would cover both forest resource and sensitive habitat inventories and monitoring the effects of various restoration projects.

Expenses for forest certification will vary from year to year and will be at their highest at the initial certification and then every five years when the re-certification is done. Routine audits are used to verify compliance with the various certification programs. The goal is to certify Savage River Forest under both the Sustainable Forest Initiative (SFI) and the Forest Stewardship Council (SFC). Each certifying agency takes a slightly different look at what is needed for sustainable forest management. Expenses will include fees for audits and annual monitoring programs for compliance with the certification requirements.

12.3.4 County Payments

Estimated: \$110,000

These are revenue payments to the Garrett County government which will vary every year. Payments are made on an annual basis based on 25% of the timber revenue generated from the forest. These payments are used to help the county offset the loss in property tax revenues which are not paid on state owned lands.

12.4 Other Revenue/Funding Sources

Annual Amounts Vary

Other budgetary funding that is utilized on an annual basis in the management of Savage River Forest comes from a variety of sources. There are General Funds which are state tax revenues provided annually to cover a small portion of the operational budget. Most of these funds are used to pay Savage River Forest staff salaries. At this point, there are four full-time state personnel working on the Savage River Forest, a forest manager, forester, maintenance supervisor, and administrative assistant. Future plans include hiring additional staffing to cover wildlife management activities, restoration projects and additional forestry related activities.

Other funding comes in the form of grants through state and federal sources and primarily is utilized in habitat and watershed restoration projects. These funds are project specific. Some funding will be obtained through partnerships and grants, such as State Highway SAFETEA funds. Expenses include the installation of culverts, removing invasive species and re-

establishing native plant communities and habitat. Additional funding comes through submitting applications for trail grants for forest trail maintenance and construction.

12.5 Summary

This is the general breakdown on Revenues and Operational Cost associated with the Savage River State Forest. As described, these figures will vary from year to year. A more detailed picture on revenues and operational cost will be provided within each Annual Work Plan and an annual report prepared by the Land Manager. This generalization of the operating budget suggests the importance of maintaining income levels in order to achieve the goals set forth in the other portions of this plan (i.e. sustainability).