*Example Management Plan shared as part of the Forest Guild's Ecological Forestry Initiative*
*www.forestguild.org/ecological_forestry.html*

**MANAGEMENT RECOMMENDATIONS**
Prepared by Russ Richardson
For Jakelands LLC Farm

## LOCATION AND GENERAL WOODLAND DESCRIPTION

This farm, consisting of 261 acres, is located in Washington Magisterial District of Calhoun County.

None of the farm was logged during the past 25 years. Nearly 2/3 of the farm has a mixed hardwood and mixed oak forest cover that is of commercial size. 20% of the farm acreage is mixed oaks and hardwoods approaching commercial size with 15% of the property a mixture of old fields and pasture in the process of returning to forest cover. Portions of the tract suffered moderate damage from the ice storm of February 2003. Approximately 10 acres of the woodland suffered severe damage during the ice storm. Portions of the tract where the ice damage is the worst have a building invasion by Japanese stiltgrass (Microstegium vimineum). The tract has interior access limited to foot travel. No timber harvesting has occurred in modern times and there are no developed oil or gas wells in the interior of the farm.

The principal timber species include: yellow poplar, black, white, scarlet, chestnut and red oak, sugar maple, ash, hickory and red maple. Black walnut, sourwood, sassafras, red bud, elm, black gum, locust and hophornbeam occur as associated species throughout the stands. The majority of the timber on the property is in the sawtimber size class. The sites are generally good quality for the production of forest products. The tract shows historical evidence of fires with none appearing to have been burned within the past twenty five years. No serious insect or disease problems were detected during this evaluation. However, an ongoing invasion by Chinese tree of heaven and Japanese stiltgrass is a serious threat to the future productivity of the farm and woodland.

Most of the stands on the property are at or nearing commercial size and the harvest of timber is a moderate to high priority for the woodland owner at this time. In much of the property where the sites are the most fertile, grape vines are a severe problem. The worst grape infestations are found in areas severely damaged by ice in 2003, these are also the worst places for the Microstegium invasion.

* Total Volume – 1,313,750 bd. ft.
1,360 cords

The woodland consists of a variety of tree size classes and tree species which provides for the diversity needed by game and nongame species. The recommended cutting practices, plantings and other cultural treatments will help regulate, on a continuing basis, the kind, amount and arrangement of food and cover needed by wildlife during all seasons of the year.

## LANDOWNERS OBJECTIVES

The landowner is interested in starting a forest management program that will improve

the long term value of the timber growing on the property while providing for an increased diversity of wildlife species along with enhanced opportunities for woodland recreation. The primary objective of this plan is to present recommendations designed to assist the landowner in meeting his goals while improving the quality of individual trees. Management activities will be concentrated on the better quality sites where maximum returns from wood products and associated forest benefits can be realized. Employment of cultural treatments on the better woodland sites will also shorten the time necessary to produce a high quality sawlog or veneer product. Maximum benefits can be obtained by frequent treatments of each stand to maintain the best stocking of crop trees over the entire rotation.

**BOUNDARIES**

The boundaries to the property were surveyed in 2004. They are mostly old fence and are blazed painted and posted.

A boundary line map is shown on Page 5. Well-marked boundaries are an asset on any property and a must when timber is sold. All boundary lines should be marked with paint. Red is probably the most often used color.

**ACCESSIBILITY**

Access to the tract is average for Calhoun County. The farm has access from a private road that follows the Spruce Run valley to Frozen Run Road (Calhoun County Route 11/4). At this time there are no developed roads or trails to the upland portions of the Rubin property.

Development and improvement of access trails into the woodland and maintaining them in an open condition will enhance recreational options and make the suggested and planned forest management activities easier to implement.

Carefully planned access roads should be a part of any future timber sales.

**TOPOGRAPHY AND SOILS**

For soils information on the tract, refer to the soils map and woodland suitability information prepared by the Soil Conservation Service on Page 4.

Elevation on the tract ranges from approximately 850 feet in the bottom of Spruce Run to over 1,300 feet in several locations along the east, west and north boundaries. Most of the tract is moderately to steeply sloping with easterly, northwesterly and southerly exposures. About 20% of the property has slopes with exposures to the southwest.

**SITE INDEX**

Site index is a term used by foresters to describe the site productivity for a certain tree species or groups of tree species. The site index used in this plan is based on the height that a tree will grow on a particular soil in 50 years. If a tree grows 50 feet in 50 years, the site index is 50; if it grows 100 feet in the same time period, the site index is 100 and the larger the number, the higher the site productivity. Generally, the better sites are in the bottoms, hollows and on the northern slopes while the poorer sites are on the ridges and southern slopes.

## FOREST TYPES

A pure forest stand is considered to be one in which 80% or more of the trees in the main canopy of the crown are of the same species. In a mixed stand, no species makes up more than 80% of the main crown canopy. There is no stand on the Jakelands property that is dominated by one species.

The following are the timber types associated with this plan, see page 6.

(OM) Mixed Oak
(OH/OM) Mixed hardwood/mixed oak
(OM/OH) Mixed hardwood/mixed oak
(AF) Abandoned Fields
(RI) Riparian

## RECONNAISSANCE AND CRUISE INFORMATION COLLECTED

The timber on the property was inventoried using a variable plot sampling method. One hundred ten plots were located in the wooded areas. In each plot that was visited, information was recorded pertaining to the present condition of the trees and vegetation, species present, relative age, size, volume, stocking, regeneration, harvesting possibilities and wildlife capabilities.

The trees were divided into three classes; sawtimber, poletimber and seedling-sapling (see Size Class Map on page 7). Those placed in the sawtimber category were at least eleven inches in diameter breast high (DBH = 4 1/2 feet above the average ground level) and relatively straight and free of defects for at least 16 feet. Sawtimber volume is measured in board feet, with one board foot representing a board one foot square and one inch thick. Sawtimber volumes were calculated using the International 1/4" Tree Scale. Trees less than eleven inches, but greater than five inches DBH were placed in the poletimber class. These were measured in cords, with one cord being a pile of wood four feet high, four feet wide and eight feet long (128 cubic feet).

All trees averaging less than 5" DBH were recorded as seedling and sapling stands.

Also all active and potential wildlife den trees were tallied as were snags and large wolf trees, especially hard mast producers such as oak, hickory, beech, etc.

The location of water seeps and springs, dense brushy areas, and evergreen areas such as laurel thickets and hemlock thickets were recorded.

Open areas with the potential to become woodland either by natural regeneration or through the planting of trees were also recorded, as were other open areas and potential wildlife feeding areas. These latter categories include natural and man-made openings such as wetland areas, bogs, roads and already harvested areas. In noting these areas, understory shrubs and trees were tallied according to density and extent.

Indications of browse lines in the forest understory that would signify concentrated or abnormally heavy wildlife populations were noted as to the extent of browsing and height of the browse line.

The Rubin property has a high deer population! The need to harvest as many deer as possible from the property is a very high priority to allow the next forest to develop in the ice storm damaged areas.

## SOILS MAP

Landowner: Michael Rubin-Jakelands LLC Address: 3 Western Drive Colts Neck, NJ 07722
Acres in farm: 261 Location: Both sides of Spruce Run off Calhoun County Route 11/4 (Frozen Run Road) in southeastern Calhoun County. Farm is located approximately 8 miles east of the intersection of Calhoun County Route 11, Euclid/Nicut Road and WV Route 16 in Orma which is about five miles south of Arnoldsburg, WV. Date planned August 2005 By: Russ Richardson

**LEGEND :**
Scale 1"=1,000'
Stream-
Road-
Ridge-
Soil type boundary-
Property boundary-

**SOILS INFORMATION**

| Soil Name | Map Symbol | Erosion Hazard | Equipment Limitation | Common Trees |
|---|---|---|---|---|
| **Gilpin-Peabody Silt Loam** | GpF3 | Severe | Severe | Yellow Poplar<br>Oaks |
| These soils are moderately productive silt/clay loam soils on steeply sloping land. | | | | |
| **Vandalia** | VbD | Severe | Moderate | Poplar<br>Walnut<br>Sugar maple |
| These soils are deep, fertile and highly erosive soils found on lower slopes. | | | | |
| **Gilpin-Pineville** | GvF | Moderate | Moderate | Oaks |
| These soils are deep, sandy loams found on ridges and sideslopes | | | | |
| **Pineville** | PvE | Moderate | Moderate | Oaks<br>Poplar |
| These soils are extremely productive, deep, sandy loams found in coves and midslopes. | | | | |
| **Gilpin-Upshur Silt Loam** | UgE3 | Moderate | Moderate | Red oak<br>Poplar |
| These soils are erosive, moderately deep and productive silt loams on sloping land. | | | | |

## CONDITION OF BOUNDARIES

Landowner: Michael Rubin-Jakelands LLC Address: 3 Western Drive Colts Neck, NJ 07722
Acres in farm: 261 Location: Both sides of Spruce Run off Calhoun County Route 11/4 (Frozen Run Road) in southeastern Calhoun County. Farm is located approximately 8 miles east of the intersection of Calhoun County Route 11, Euclid/Nicut Road and WV Route 16 in Orma which is about five miles south of Arnoldsburg, WV. Date planned August 2005 By: Russ Richardson

**Legend:**
Scale- 1" = 1,000'
Wire fence-
Stream-
Road-

**FOREST TYPE MAP**

Landowner: Michael Rubin-Jakelands LLC Address: 3 Western Drive Colts Neck, NJ 07722
Acres in farm: 261 Location: Both sides of Spruce Run off Calhoun County Route 11/4 (Frozen Run Road) in southeastern Calhoun County. Farm is located approximately 8 miles east of the intersection of Calhoun County Route 11, Euclid/Nicut Road and WV Route 16 in Orma which is about five miles south of Arnoldsburg, WV. Date planned August 2005 By: Russ Richardson

**Legend:**
Scale 1" = 1,000'
Property boundary/fence-
Road-
Open land-
Stream-
Ridge-
Forest type boundary-
Forest Type- 1, 2, 3, etc.

## SIZE CLASS MAP

Landowner: Michael Rubin-Jakelands LLC Address: 3 Western Drive Colts Neck, NJ 07722
Acres in farm: 261 Location: Both sides of Spruce Run off Calhoun County Route 11/4 (Frozen Run Road) in southeastern Calhoun County. Farm is located approximately 8 miles east of the intersection of Calhoun County Route 11, Euclid/Nicut Road and WV Route 16 in Orma which is about five miles south of Arnoldsburg, WV. Date planned August 2005 By: Russ Richardson

**Legend:**

Scale 1" = 1,000'
Property boundary/fence-
Road-
Open land-
Stream-
Ridge-
Forest type boundary-
Forest Type- 1, 2, 3, etc.

**SAWTIMBER STANDS-**

**SAPLING STANDS-**

**POLETIMBER STANDS-**

## FOREST MANAGEMENT RECOMMENDATIONS

| STAND | ACRES | | RECOMMENDATIONS |
|---|---|---|---|
| 1-RI | 12 | Average age: 20 years | Soils: PvE<br>Site Index: 75+ |

**Stand Description Narrative**:

This is a narrow band of streamside land nearly a mile long of that runs through the length of the Jakelands property in the bottom of Spruce Run. The growing sites are extremely fertile and the gently sloping land has been farmed and grazed for generations. All land in the type is in varying stages of returning to forest cover after over 150 years in agricultural use. The bottom of Spruce Run also contains some gas and oil lines and at least one producing well and the main road accessing the Jakelands property passes the length of the type. Sycamore, hornbeam, black locust, boxelder, red maple and yellow poplar are the most common tree species in the type. The area was not damaged during the ice storm of 2003. Access is fair to very good and the entire stand is gently sloping. Japanese stiltgrass is becoming established along the stream banks and roadside. Some streamside areas have alder patches that could be promoted for woodcock habitat. Throughout the area black walnut of various sizes are present. During planned timber harvesting activities on the property, several areas within the type will be utilized and developed as landing locations.

**Recommended Treatment Narrative**:

The developing timber in the stand is of modest potential quality and value. The area has significant wildlife value and the stream corridor is actively used by numerous species of native wildlife. Because of the stream passing through the center of the type, it is suggested that the area be maintained for wildlife habitat. At the conclusion of timber harvesting activities areas cleared for log landings should be reclaimed and maintained as wildlife clearings. Alder could be promoted in some of the wetter bottomland locations. Improvements in the condition and maintenance of the road into and through the property would greatly improve water quality in Spruce Run.

| | | | |
|---|---|---|---|
| 2-OM | 17 | Average Age: 40+ years | Soils: PvE, GpF3<br>Site Index: 70+ |

**Stand Description Narrative**:

This is medium poletimber sized mixed oak stand on moderately to very steeply sloping land that is dominated by exposures to the southeast. Most of the type was last logged about 40 years ago and portions of the stand were burned within the past twenty five years. The type is in two locations along the western side of Spruce Run near the southern end of the Jakelands property. The area was lightly impacted during the 2003 ice storm and none of the stand suffered severe damage. The stand is 91% oak and 9% of the current overstory basal area is cull. Other than frontage on the road up Spruce Run, access to most of the stand is undeveloped and poor. Black oak represents 34% of the stand overstory which also includes scarlet oak 24%, red oak 19% and white oak 14% sugar maple 5% and yellow poplar 4%. Gypsy moths have the potential for causing severe damage in this stand. Deer use in the area is heavy.

**Recommended Treatment Narrative**:

The stand is close to commercial size and no specific management activity is suggested for the type during the current planning period. Access into and through the stand will be improved during planned timber harvests in adjacent timber types. The area should be reevaluated when adjacent forest areas are logged. The first entry into the stand should be a commercial thinning and improvement cut.

3-OM 43 Average Age: 45-60+ years Soils: GvF, GpF3
Site Index: 60+

**Stand Description Narrative**:

This is mixed oak stand of medium sawtimber size on land that is dominated by moderate to steeply sloping exposures to the southwest. Upland portions of the stand are moderately sloping with steeper areas generally under 1,100' elevation. The stand is found in six different locations with only the highest elevation portion of the type (10 acres located in the northeasternmost corner of the farm) that suffered ice damage. The overstory is 96% oak with scarlet oak at 61% the most common tree in the stand. Other common overstory species include: black oak 18%, white oak 8%, chestnut oak 6%, red oak 3% and poplar and hickory 2% each. All portions of the type have been harvested within the past 75 years. Culls comprise nearly 14% of the stand basal area. Access to most portions of the stand will be established during planned timber harvests in the type. Gypsy moths have the potential for causing serious damage in this stand. The entire stand is sloping. Old farm trails and livestock paths exist to most locations but no portions of the stand are ATV accessible. Less than ten acres of the stand was severely damaged during the ice storm of 2003. Deer use in the area is extremely heavy.

**Recommended Treatment Narrative**:

All portions of the stand should be harvested during the current planning period. Development of access is an extremely high priority that should be accomplished during planned timber harvesting operations. Because of the scattered location of the stands on the farm it is suggested that harvesting and management activities be planned to coincide with work in adjacent forest stands. Harvests should be improvement oriented and emphasis should be on removal of mature scarlet oak. Black, white and red oak trees of the highest quality possible should be retained for continued growth. Access should be maintained once it has been improved. Increased hunting pressure is encouraged.

4-OH/OM 29 Average Age: 30-45+ years Soils: GvF, GpF3, PvE
Site Index: 70+

**Stand Description Narrative**:

This is mixed hardwood and mixed oak stand of medium poletimber size on sloping land that is dominated by easterly exposures. Yellow poplar is the most common tree representing 71% of the overstory basal area. The stand is found in four different locations with a grapevine infestation impacting developing timber quality in nearly all areas of the type. Nearly 1/3 of the type suffered severe damage during the 2003 ice storm but only 10% of the stand basal area is cull quality. Other species found in the overstory of the stand include: black oak 10%, chestnut oak 6% and red oak, white oak, red maple and black walnut 3% each. All portions of the type have been farmed or pastured within the past 50 years and the developing timber is of high potential quality. Nearly all portions of the stand are crossed by a bench that occurs between the 1,100 foot and 1'200 foot contours. None of the stand is presently accessible. The bench is a prominent feature of the farm and access to most portions of the stand will be established during planned timber harvests in surrounding forest types. Gypsy moths have the potential for causing minimal damage to this stand. A well defined spring seep was identified on a bench northwest of the old Smith farmhouse site at the interface of Stands 4 and 5. Deer use in the area is extremely heavy.

**Recommended Treatment Narrative**:

All portions of the stand should be treated for grapevine removal as soon as possible. Improvement of access is an extremely high priority that should be accomplished during planned timber harvesting operations on the farm. Because of the scattered location of the stands it is suggested that once the grapevine treatment has been completed that harvesting and management activities be planned to coincide with work in adjacent forest stands. With the exception of light commercial thinning in the easternmost portion of the type, no harvesting is recommended for this type during the current planning period. Access should be maintained once it has been improved. Increased hunting pressure is encouraged.

5-AF 32 Average Age: 15-30+ years Soils: GvF, GpF3, UgD3, PvE
Site Index: 75+

**Stand Description Narrative**:

This is mixed stand of small poletimber size found in three locations on the western half of the Jakelands property. All areas are returning to a forest cover after several generations of use as hay, orchard, tilled fields and pasture. The entire type is on land with eastern exposures and moderately to extremely fertile growing sites. Stocking is variable and ranges from partially open land with scattered redbud and walnut to dense yellow poplar thickets. Multifloral rose thickets limit access in portions of the stand. At 57%, yellow poplar is the most common overstory tree in the stand with black and white oak, hickory, black walnut, white ash and red maple found throughout the type. Grapevines are a developing problem wherever the trees are older and grapevines account for nearly all damage to the crowns of trees in the stand. Less than 10% of the current stand inventory is cull. Because of the young age of the stand, ice damage from the 2003 ice storm will have a minimal impact on the future value of timber in the stand. Terrain within the type is some of the most gentle on the farm and includes nearly level ridgetop locations and a long bench that lies between the 1,000 and 1,100 foot contours. Access by other than foot travel is poor. Gypsy moths have a low potential for causing damage in this stand. Deer use in the area is extremely heavy and ruffed grouse and American woodcock were encountered during the inventory of the stand.

**Recommended Treatment Narrative**:

Within the next five years 80% of the type should be treated for grapevine removal. Access improvement is needed and should be planned well in advance. Because of the young age of most of the stand, suggested access improvements may not possible to accomplish during planned timber harvesting operations scheduled without additional investment. Access should be maintained once it has been improved. Increased hunting pressure is encouraged. A spring seep located on the bench near the head of the hollow above the old Smith homestead could be developed into a large wildlife waterhole. Several additional seeps are located along the bench which is identifiable for more than a two mile length through all aspects and exposures of the Jakelands property.

6-OM/OH 43 Average Age: 45-60+ years Soils: GvF, GpF3
Site Index: 60+

**Stand Description Narrative**:

This is mixed oak and mixed hardwood stand of medium sawtimber size on land that is dominated by moderate to steeply sloping hillsides with exposures to the east and southeast. This timber stand suffered the most damage during the 2003 ice storm. The stand contains numerous rock outcrops and some of the largest and highest quality timber on the Jakelands property. Growing sites for most of the stand are very good. Access does not exist to the stand and the ledge outcrop near the 1,200 foot contour is a prominent feature that will impact some management options. The rock outcrops and cliffs contain several areas where evidence of persistent use by black bears was observed. Upland portions of the stand are moderately sloping and the interior of the cove that contains the largest timber is crossed by a gently sloping bench. The stand is found in two different locations along the western property boundary. 25% of the type suffered ice damage. The overstory is 74% oak with black oak at 32% the most common tree in the stand. Other common overstory species include: red oak 18%, white oak 11%, chestnut oak 10%, yellow poplar 15%, hickory 5%, basswood 4% and scarlet oak 3%. No portions of the type have been harvested within the past 50 years. Culls comprise nearly 11% of the stand basal area. Gypsy moths have the potential for causing serious damage in this stand. Japanese stiltgrass has become established in some areas where ice damage was most severe. Deer use in the area is extremely heavy.

**Recommended Treatment Narrative**:

The portions of the stand that suffered ice damage are recovering very quickly. All portions of the stand should be harvested during the current planning period. Harvests should coincide with work in other portions of the farm and of ice damaged areas should have a lower initial priority. Development of access is a high priority improvement that should be accomplished during planned timber harvesting operations. Yellow poplar, black, white and red oak trees of the highest quality possible should be retained for continued growth. Access should be maintained once it has been improved. Increased hunting pressure is encouraged. Areas recognized as den sites for wildlife should be excluded from harvesting.

7-OM 28 Average Age: 60+ years Soils: GvF, GpF3, PvE
Site Index: 60+

**Stand Description Narrative**:

This is mixed oak stand of medium sawtimber size on land that is dominated by moderately sloping exposures to the south. Upland portions of the stand are moderately sloping with most of the type on land generally under 1100' elevation. The stand dominates the hollow north of the old Smith homestead. The stand suffered minor damage during the 2003 ice storm. The overstory is 85% oak with black oak at 30% the most common tree in the stand. Other common overstory species include: scarlet oak 24%, white oak 17%, chestnut oak 4%, red oak 10%, yellow poplar 6%, hickory 3% beech 2% and walnut and hemlock 1% each. None of the type has been harvested within the past 65+ years. Culls comprise nearly 10% of the stand basal area. A gently sloping bench crosses the length of the type between the 1,100 and 1,200 foot contours. Access to most portions of the stand will be established during planned timber harvest in the type. Gypsy moths have the potential for causing serious damage in this stand. Less than two acres of the stand was damaged during the ice storm of 2003. Deer use in the area is heavy. The ravine in the middle of the type contains the largest concentration of hemlock on the property.

**Recommended Treatment Narrative**:

The entire stand should be harvested during the current planning period. Development of access is a high priority that should be accomplished during planned timber harvesting operations. The harvest should be regeneration oriented and emphasis should be on removal of mature scarlet oak, black oak and chestnut oak. Black, white and red oak trees of the highest quality possible should be retained for continued growth and seed production. Hemlock trees should be retained for their wildlife value. Access should be maintained once it has been improved. Increased hunting pressure is encouraged.

8-OM/OH 54 Average Age: 45+ years Soils: GvF, GpF3, PvE
Site Index: 60+

**Stand Description Narrative**:

The largest area forest type in the Jakelands property, this is mixed oak and mixed hardwood stand of medium sawtimber size on land that is dominated by moderate to steeply sloping exposures to the northwest. The entire stand is on the east side of Spruce Run and the area suffered minimal damage during the 2003 ice storm. The stand contains the largest average diameter trees on the Jakelands property and contains timber of potentially very high quality. Growing sites for most of the stand are very good. Access does not exist to the stand and the type is in two locations where the entire hillside has northwesterly exposures. Upland portions of the stand are moderately sloping and a bench near the 1,100 foot contour will be an important location for a permanent access trail. The stand is found in two different locations between Spruce Run and the eastern property boundary. The overstory is 71% oak with black oak at 20% the most common tree in the stand. Other common overstory species include: red oak 17%, white oak 18%, chestnut oak 9%, yellow poplar 10%, hickory 8%, basswood, ash and hemlock 2% each, red maple 4%, and scarlet oak 7%. No portions of the type have been harvested within the past 50 years. Culls comprise nearly 16% of the stand basal area. Gypsy moths have the potential for causing serious damage in this stand. The entire stand is sloping. Deer use in the area is moderate.

**Recommended Treatment Narrative**:

All portions of the stand should be harvested in a forest improvement during the current planning period. Development of access is a high priority improvement that should be accomplished during planned timber harvesting operations. The main access trail though the type should follow the bench between the 1,100 and 1,200 foot contours. Yellow poplar, black, white and red oak trees of the highest quality possible should be retained for continued growth. Access should be maintained once it has been improved. Increased hunting pressure is encouraged.

**UP** 2 OPEN/UNPLANNED Soils: PvE
Site Index: N/A

**Stand Description Narrative**:

Open land and the former Smith home site on gently sloping upland terrain located in the northcentral corner of the Jakelands farm.

## GYPSY MOTH MINIMIZING IMPACTS IN YOUR WOODLANDS

The gypsy moth is potentially the most destructive forest pest threatening West Virginia woodlands. Since its inadvertent introduction into Massachusetts in 1869, it has spread naturally south and west at approximately 5-10 miles per year. In the last 10 years, it has been spreading across the eastern panhandle counties of this state. Predictions are that it will be someday causing damage in every county of West Virginia.

In the northeastern states, gypsy moth populations peak every 8 to 11 years. They feed on more than 500 different tree and shrub species in forest and urban areas.

### RECOMMENDATIONS

**There are five essential steps in minimizing gypsy moth impacts:**

### 1. IDENTIFY STANDS WHERE SEVERE IMPACTS ARE LIKELY.

Gypsy moths attack trees by feeding on their leaves. Severe defoliation and mortality are most likely in stands having a high percentage of oak, the favorite food of gypsy moth caterpillars. Generally, if 60 percent or more of a hardwood tree's foliage is removed, the tree will, later in the same growing season produce a new set of leaves. This places a heavy demand on the tree's food reserves and makes it more vulnerable to attack by other organisms. This significantly increases tree deaths.

Based upon evaluations of gypsy moth mortality in West Virginia, the Division of Forestry has developed guidelines for estimating the potential mortality that can be expected following one, two or three consecutive years of gypsy moth defoliation. These guidelines are simply a rule-of-thumb and may not account for all of the variation in damage that may be caused. The extent of mortality will be affected by many interrelated factors like frequency and intensity of defoliation, tree stress, actions of secondary organisms such as shoestring root rot and the two-lined chestnut borer, influence of gypsy moth parasites and predators, effectiveness of control measures and weather conditions. Each of these factors is in themselves difficult to predict. Although not perfect, the guidelines do provide an indication as to where severe impacts are most likely to occur.

Using these guidelines, your timber stands were assigned hazard ratings for potential mortality from gypsy moth. (See Gypsy Moth Hazard Rating Table and Map on pages 15 and 16.)

The Hazard Rating Table and Map indicates that 193 acres of the property is moderately to highly susceptible to defoliation by gypsy moths and will probably experience moderate mortality after the first gypsy moth outbreak. The potential mortality will be 304,100 Board Feet which is nearly 23 percent of the total woodland volume.

Now that you know WHERE severe impacts can be expected you need to know WHEN control actions are needed.

### 2. DETERMINING WHEN DEFOLIATING POPULATIONS ARE PRESENT.

**The Jakelands woodlands are not now infested with the gypsy moth.**

Treatments to control gypsy moth will be needed when gypsy moth egg masses reach or exceed the following levels. Such numbers will seriously impact your management objective:

| MANAGEMENT OBJECTIVE | EGG MASSES/ACRE |
|---|---|
| Timber | 1,200 |
| Aesthetics | 650 |
| Wildlife - Mast Production | 500 |
| Recreation - Nuisance Prevention | 250 |

Inspect your woodland for egg masses sometime each year during the period from September to April. If these are found, count the number on a 1/40 acre plot. To do this step off a rectangular plot 27 feet by 40 feet. Count the number of new egg masses on trees in this area and multiply by 40 to obtain the approximate number of egg masses per acre. Egg mass counts should be made in no less than ten plots located in the stands having moderate to high gypsy moth hazard ratings. Average the per acre egg mass counts and if you find 1,200 or more egg masses you can expect moderate to heavy defoliation and subsequent tree mortality unless you apply control measures to the stands. Lesser numbers, as shown by the above table, also cause problems.

### 3. SPRAY TO PREVENT HEAVY DEFOLIATION

Spraying is rather expensive, but well worth the money to protect high value sawlog and veneer quality trees and stands where moderate to high tree mortality is expected.

The last column of the Hazard Rating Table prioritizes your timber stands for aerial sprays to minimize the impacts of gypsy moth. The highest priority for spraying is number 1. Higher numbers indicate a lower priority.

Contact your consulting forester, the local service forester or entomologists in the West Virginia Department of Agriculture, Plant Industries Division for specific control recommendations. You may be eligible to participate in the State-operated control program. If not, you will be provided with a list of aerial applicators that will treat your woodlands for a fee. Spraying must be done in May to early June when the caterpillars are small.

### 4. USE SILVICULTURE TO MINIMIZE IMPACTS

Silvicultural treatments can be used in advance of gypsy moth infestation to minimize gypsy moth impacts. Such treatments decrease the susceptibility to defoliation and by strengthen the stand against tree mortality.

The thinning and improvement cuttings recommended in the Forest Management Recommendations section of this plan will increase the vigor of residual trees by increasing both crown and root growing space. Healthy, vigorous trees are more likely to survive and recover from gypsy moth defoliation and to resist attack by secondary organisms.

The recommended thinnings will also help reduce future defoliation intensity by decreasing the number of trees that are the favored food of gypsy moth.

The thinnings will strengthen the stands against mortality by removing high risk trees before they are defoliated and die. High risk trees are low vigor trees with poor crowns.

### 5. SALVAGE DEAD TREES WITHIN TWO YEARS

Despite your precautions, if the gypsy moth is allowed to feed, some trees will die within one to three years after defoliation. Unfortunately, the value of veneer trees disappears as soon as they die and dead sawtimber trees lose 10 to 15 percent of their value each year they are dead because of drying checks, wood decay and wood borer defects. If possible, the salvage and utilization of dead timber will reduce the economic loss. However, the utilization of dead sawtimber trees is feasible for the first two to three years after death, and it is preferred that they be salvaged within the first year after death. Dead trees can be used for pulpwood for at least five years after death.

**GYPSY MOTH HAZARD RATING***

| STAND # | ACRES | HAZARD RATING | POTENTIAL % | MORTALITY BD FT | SPRAY PRIORITY |
|---|---|---|---|---|---|
| 1 | 12 | VERY LOW | 0% | -0- | 2 |
| 2 | 17 | HIGH | 25% | 15,200 | 2 |
| 3 | 43 | HIGH | 25% | 58,400 | 2 |
| 4 | 29 | LOW | 5% | 3,450 | 2 |
| 5 | 32 | MODERATE | 12% | 1,400 | 2 |
| 6 | 44 | HIGH | 25% | 79,400 | 2 |
| 7 | 28 | HIGH | 25% | 59,200 | 2 |
| 8 | 29 | MODERATE | 23% | 87,050 | 2 |

TOTAL POTENTIAL MORTALITY= 304,100 BD FT OR 23% OF TOTAL TRACT VOLUME.

* Guidelines for Determining Gypsy Moth Hazard :

| % OAK IN STAND | HAZARD RATING | POTENTIAL MORTALITY |
|---|---|---|
| 50% + | HIGH | 25% + |
| 21-49% | MODERATE | 11-24% |
| 11-20% | LOW | 5-10% |
| 0-10% | VERY LOW | 0-4% |

**GYPSY MOTH HAZARD RATING MAP**

Landowner: Michael Rubin-Jakelands LLC Address: 3 Western Drive Colts Neck, NJ 07722
Acres in farm: 261 Location: Both sides of Spruce Run off Calhoun County Route 11/4 (Frozen Run Road) in southeastern Calhoun County. Farm is located approximately 8 miles east of the intersection of Calhoun County Route 11, Euclid/Nicut Road and WV Route 16 in Orma which is about five miles south of Arnoldsburg, WV. Date planned August 2005 By: Russ Richardson

**Legend:**
Scale 1" = 1,000'
Property boundary-
Road-
Stream-
Forest type boundary-

HIGH HAZARD-

MODERATE HAZARD-

LOW HAZARD-

## GENERAL RECOMMENDATIONS

1. Protect all woodland from forest fires, insects and diseases. Diseased trees should be removed from the stand during cultural treatments. Report all forest fires immediately to the Division of Forestry Forest Ranger or Service Forester for your county or to your local volunteer fire department.

2. Leave at least three to five standing dead snags or live den trees per acre, for cavity nesting birds and animals.

3. Mature sawtimber, certain undesirable species and most damaged trees should be harvested, leaving a good stocking of immature trees of desirable species for the future stand. However, some large wolf trees, especially good mast producers, should be left to benefit wildlife.

4. Concentrate cultural work on the better sites first, where the largest increase in benefits for both timber production and wildlife can be obtained.

5. Water diversion measures (refer to supplemental material) and seeding should be undertaken on constructed log roads and landings to reduce the possibility of erosion and siltation and to create wildlife feeding areas.

6. Destructive grazing by livestock and deer can be extremely detrimental to forest trees and regeneration. Therefore, livestock grazing of the woodland should be restricted. Control efforts, primarily by controlling hunting pressure, should be considered to maintain population levels of deer compatible with the capacity of the habitat.

   Note: Research has shown the hardwood forest can't sustain a population of whitetail deer above about 18 per square mile without damage to the forest and to other wildlife species.

7. Construct and maintain a good system of forest roads on the property to provide easy access for future woodland management work and serve as firebreaks and access lanes should fire suppression be needed in the future. Properly located roads will significantly increase the value of the property, provide for increased recreational opportunities and, if properly seeded using wildlife mixtures, will greatly benefit many species of birds and animals.

8. Plant open or understocked areas with desirable tree species. It is recommended that plantations include more than one tree species to minimize the effects of any disease, insect or browsing problem that may attack a single tree species. Some species recommended for planting include white, red and Scots pines, Norway spruce, yellow poplar and black walnut.

9. Control of competing vegetation in established plantations is desirable and necessary for optimum growth and survival of the planted seedlings.

10. Various silvicultural treatments should be conducted over the woodland acreage. These include cleanings in sapling hardwood stands, thinnings in pole and light sawtimber stands to improve species composition and stocking of desirable crop trees and crown release cuttings to release desirable regeneration from

overtopping cull trees.

11. Utilize material from thinning operations, whenever markets exist for these intermediate products.

12. Cut climbing vines which are growing on desirable trees. Vines can cause the formation of crooks and forks, thereby reducing the quality and value of future crop trees. However, vines, especially grape vines provide excellent wildlife food and sometimes cover. Grape vines in low valued tree species should not be cut and if vines have already created an arbor in the tree tops they should be left alone; work around these trees.

13. Maintain wildlife food species such as dogwood, serviceberry, sumac and viburnum, especially around the woodland edge. Border plantings of gray dogwood, chestnut chinquapin, bear oak and other seedlings desirable for wildlife food should be established.

14. Maintain buffer areas along all well-traveled roads and along streams to maintain aesthetic appeal and to protect streams from siltation or dramatic temperature changes. However, such buffer areas can be harvested or otherwise treated if affected by windstorms, insects, diseases, over maturity or in cases where safety dictates.

15. Consult a forester whenever questions arise regarding the management of the woodland acreage. Do not sell timber or any forest products without a written agreement or contract. A contract prepared by a forester, when followed, prevents damage to the stand and environment and usually results in better prices.

16. Consider the lifetime of enjoyment you can receive from a well managed and improved forest environment. Encourage other woodland owners to adopt forest management programs so they too can provide for the future of the State and future family generations. A well-managed forest will provide profits and many other amenities on a perpetual basis.

## FOREST MANAGEMENT HARVEST RECOMMENDATIONS

### HARVESTING TREES

A majority of the farm has timber of commercial size at this time and several harvests are suggested in this plan. It is recommended that when a harvest is planned that the trees to be sold be marked by a professional forester and that the written sale contract be prepared to assure the use of good logging practices. A preliminary cruise of the standing timber has been made along with an estimate of the existing timber volume on the tract and wildlife diversity, recreational potential, and water resources, which stands should be harvested and in what order. The timber related results of this cruise are shown in Table I on page 7a. The proposed harvest cuts will leave adequate residual volume for another harvest in 10 to 12 years and will meet the silvicultural needs of the stand and the wildlife needs for the area while meeting the landowners' objectives and economic needs. The quality of the standing timber should also be improved by these harvest operations, through the removal of a large portion of the undesirable species and trees of poor form or quality.

Note: All loggers are required to be licensed to log in West Virginia. They must also have at least one person who has been certified on the operation. Loggers must erect a sign showing the loggers name and license number. It should be in the log landing at all times. The logger must also notify the West Virginia Division of Forestry of his/her operation.

**ROADS**

Most stands on the tract are not accessible at the present time and road construction and access improvement will be an emphasis of initial harvesting operations. The locations of these roads should be planned and laid out prior to harvest. These should be constructed in strategic locations to provide access to the majority of stands for future forest management work (refer to supplemental material). On completing each harvest cut, the roads and landings should be seeded to a mixture of perennial grasses, legumes and appropriate wildlife seed mixtures. Necessary water diversion measures should be installed. Properly maintained access roads will also serve as excellent firebreaks and fire access roads, should the need for fire suppression develop in the future. These roads also provide opportunities for woodland recreation such as hunting, hiking, horseback riding, etc.

**HARVESTING NEAR STREAMS, WETLANDS OR RIPARIAN ZONES**

Any harvesting operations or other forest management activities, including road building, that occur in or near streams, wetlands or riparian zones should be conducted with extreme caution.

These areas are frequently critical zones for wildlife and may be used more extensively by a variety of wildlife than any other.

Streams include those that are permanent (perennial)and wet weather (intermittent) in nature; wetlands are lowlands covered with shallow and sometimes temporary waters and those with a water table near the surface, at least part of the year; and riparian zones are areas of vegetation bordering flows, streams, lakes, ponds and marshes.

No-cut buffer strips or only very light selection cuts should be planned along streams. All tree tops should be pulled a minimum of 25 feet from perennial and intermittent streams.

Wetland and riparian zones vary markedly in the amount and type of vegetation present. Wetlands can be predominantly forested, occupied by shrubs and grasses or even have emergence or aquatic beds. There are over 200 different species of birds, mammals, reptiles and amphibians in the eastern United States to some extent that depend on wetlands for habitat.

Forested riparian zones along streams provide migration routes for some wildlife species and may, in some areas be the only permanent habitats available to certain others.

Therefore, no cut or carefully planned minimal selection cuts should be prescribed in and around these areas. At least a 50 foot buffer zone should be maintained. All trees felled into these areas, including the tree tops should be winched from the area. Equipment should not be permitted within 100 feet of these areas.

## THREATENED AND ENDANGERED SPECIES RECOGNITION

Although very few occur in West Virginia, there are certain species of plants and animals which have been placed on the U.S. Fish and Wildlife Service (USFWS) list of "Threatened or Endangered Species" in accordance with the Federal Endangered Species Act of 1973.

Check with your state wildlife agency an/or Natural Heritage program to find out what the threatened and endangered species are in your area. Assistance is available in determining if an endangered species lives on your property. Natural Heritage programs keep records about the location and biology of many species. They make this information available to landowners, businesses, organizations, and government agencies. West Virginia has a threatened and endangered species coordinator, who can help you to make informed decisions as you implement your plan and manage your land. You should contact the:

West Virginia Department of Natural Resources
Nongame Wildlife and Natural Heritage Program
Post Office Box 67
Elkins, WV 26241-0067
Phone: (304) 637-0245
FAX: (304) 637-0250

The current list of threatened and endangered species for West Virginia is:

| COMMON NAME | SCIENTIFIC NAME | STATUS |
|---|---|---|
| (Mammals) | | |
| Indiana Bat | Myotis sodalis | Endangered |
| Virginia northern flying squirrel | Glaugomys sabrinus fiscus | Endangered |
| Virginia big-eared bat | Plecotus iownsendll virginianus | Endangered |
| | | |
| (Birds) | | |
| American peregrine falcon | Falco peregrinus anatum | Endangered |
| | | |
| (Amphibians) | | |
| Cheat Mountain salamander | Plethodon netting | Threatened |
| | | |
| (Clams) | | |
| Clubshell | Pleurobema claua | Endangered |
| Fanshell | Cyprogenia stegaria | Endangered |
| James River Spinymussel | Pleurobema collina | Endangered |
| Pink: Mucket Pearlymussel | Lampsilis abrupta | Endangered |
| Tubercied-blossom Pearlymussel | Epioblasma (=dysnomia) torulosa eorulosa | Endangered |
| | | |
| (Plants) | | |
| Harperella | Ptilirnnium nodosum (=f1uviatile) | Endangered |
| Northeastern (=berbed bristle) bulrush | Scirpus ancistrochaetus | Endangered |
| Running Buffalo Clover | Trifolium stoloniferum | Endangered |
| Shale barren rock-cress | Arabis serotina | Endangered |
| Virginia spiraea | Spiraea virginiana | Threatened |

It is advisable to limit or to curtail most forest management activities when they occur in close or immediate proximity to the known habitat of threatened and endangered species.

The U.S. Fish and Wildlife Service and the West Virginia Division of Natural Resources through the Natural Heritage Program are the agencies responsible for the monitoring and protection of these species in West Virginia. A list of endangered and threatened species can be obtained from the U.S. Fish & Wildlife Service in Elkins, West Virginia or by contacting Natural Heritage Program, West Virginia Wildlife Resources, PO Box 67, Elkins, WV 26241, telephone number 304-637-0245.

The U.S. Fish and Wildlife Service and the West Virginia Division of Natural Resources through the Natural Heritage Program are the agencies responsible for the monitoring and protection of these species in West Virginia. A list of endangered and threatened species can be obtained from the U.S. Fish & Wildlife Service in Elkins, West Virginia or by contacting Natural Heritage Program, West Virginia Wildlife Resources, PO Box 67, Elkins, WV 26241, telephone number 304-637-0245.

## COST-SHARING ASSISTANCE

The Federal Government, through the West Virginia Division of Forestry, can provide up to 75% cost-sharing assistance for some of the practices recommended. Some of these practices include timber stand improvement, cull removal and grapevine treatment.

For further information on cost -sharing, contact your local Division of Forestry Office or State headquarters at 304-558-2788.

Seventy-five percent cost-share assistance can be obtained through the (FLEP) **F**orest **L**and **E**nhancement **P**rogram administered by the WV Division of Forestry. Landowners with a stewardship plan should contact the Division of Forestry office to sign up for available practices. Additional information on FLEP and the list of available programs and approved practices can be obtained on the Internet at www.wvforestry.com

## TECHNICAL ASSISTANCE

When a decision is made to carry out any of the recommended activities, your consulting forester or the local West Virginia Division of Forestry forester, are available for assistance.

They are also available for further planning assistance, cultural treatment advice and timber marking, timber sale assistance, product marketing assistance or tree planting assistance.

Educational materials and training are available from your West Virginia Division of Forestry forester and West Virginia University County Extension Agent.

## TAXES

For general information relative to Federal Income Tax reporting when selling forest products, (refer to supplemental materials).

## REFERENCE MATERIAL


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Forest Owners Guide To Timber Investments, The Federal Income Tax, and Tax Recordkeeping. USDA, Forest Service, Agricultural Handbook No. 681, July 1989, 96 pp.

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Proceedings: Guidelines for Managing Immature Appalachian Hardwood Stands. Publication 86-02. Society of American Foresters, Morgantown, WV, 1986, 283 pp.

Roach, Benjamin and Samuel Gingrich. Evenaged Silviculture For Upland Central Hardwoods. Agriculture Handbook 355. U.S. Department of Agriculture, Forest Service, Upper Darby, PA, 1968, 39 pp.

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Tubbs, Carl H and Louis J. Verme. How to Create Wildlife Openings in Northern Hardwoods. USDA-Forest Service, North Central Experiment Station, St. Paul, MN, 1972, 5 pp.

1988 West Virginia Consulting Forester Directory. West Virginia Division of Forestry, Charleston, WV, 38 pp.