The 2024 West Virginia Forest

Stewardship Operating Plan

&

Guidance Document

West Virginia Division of Forestry

Jeremy Jones

Director/State Forester

7 Players Club Drive

Charleston, WV 25311

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FOREST STEWARDSHIP OPERATING PLAN
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Introduction

The Forest Stewardship Program (FSP) is a federal program with which the West Virginia Division of Forestry is pleased to cooperate. In existence since 1978, the program provides technical assistance to help private forestland owners turn their short and long term objectives for owning the land into step by step Forest Stewardship Management Plans (FMP) that can be used as the guides in managing their lands and ultimately recognizing their goals.

The program is thus a triad of varied interest: the landowner, the State Division of Forestry and the U.S. Forest Service - all working towards a common goal. The landowner is interested in applying professional forestry techniques to profitably maintain and enhance the health and ecological integrity of the forestland, the Division is interested in helping the landowner balance the economic needs that necessarily underlies management and supports the State's economy with ecological health and societal values and the Service is interested in fulfilling its mandates detailed in the Cooperative Forestry Assistance Act of 1978.

This circular presents the format for developing Forest Stewardship Plans in West Virginia. It was developed with the advice of professional foresters serving as a subcommittee of the West Virginia Forest Stewardship Coordinating Committee (FSCC), an appointed committee of non-paid professional natural resource managers, environmental enthusiasts and cooperating agency employees that meet quarterly to advise the State Forester on administrative and technical matters. The stewardship plan that is produced meets or exceeds federal program requirements while providing for the integration of economic stability, ecological sensitivity and societal needs in the individual plans. In essence, the landowner has the property, the Division has professional foresters and contracts for additional professional expertise (licensed consulting foresters) and the Service has the appropriation. Each has a vital role in providing sustainable forestry across the State.

What is The West Virginia Forest Stewardship Program?

By providing funding for planning, the West Virginia Forest Stewardship Program is the government's way of encouraging the state's nonindustrial private forest landowners (NIPFs) to practice forest stewardship. This funding supports the belief that through profitable, ecologically sensitive and socially acceptable integrated science-based management, will forests be sustained as global assets for future generations.

The program is based on the tenet that West Virginia forests add value to all segments of society. These forests have long sustained our traditional rural economies through the employment opportunities provided by the harvest of timber and non-timber products. This has been a way of life all across the State. In fact, forestry is the only industry that is present in all 55 counties.

This educational and non-regulatory program, authorized under the Cooperative Forest Assistance Act of 1978 is managed by the West Virginia Division of Forestry through cooperation with the U.S. Forest Service, the agency through which the funds are channeled. In brief, the program provides technical assistance to private forestland owners to develop science-based management plans that will result in the realization of the owner's goals and objectives. A Forest Stewardship Coordinating Committee provides technical, procedural and logistical recommendations to the State Forester who is ultimately responsible for the administration of the program (see Appendix A.)

How Does the Program Work?

Eligible forestland owners, individuals, partnerships, groups, associations, non-profits, long term lease holders, corporations without publicly traded stock and municipal and county governments, owning between 10 and 2,000 acres may apply for assistance through the West Virginia Division of Forestry. Owners with less than 10 acres can receive technical assistance, but can not receive fiscal aid. Owners with more than 2,000 and less than 5,000 acres may be eligible for planning assistance through a special waiver provision.

The landowner, from a list provided by the DOF, engages a registered forester to develop a ten-year forest management plan that describes the forest and provides options and suggested management practices that will maintain the growth and development of timber and non-timber products while enhancing soil and water quality, wildlife, including fish, habitat and outdoor recreation. The environment is protected while desired economic and societal benefits are gained.

The completed stewardship plan is accepted by the landowner who signs a statement specifying intent to implement the plan. This triggers the funding provision which results in the forester being paid for 75 percent of the approved cost of the plan. There are additional cost share assistance programs that can help defray the cost of forest improvement practices suggested by the plan.

What Topics Are Contained in a Forest Stewardship Plan?

Plans are prepared for individual properties and each is unique according to the landowner's goals and objectives and the type of woodland that is owned. However, the following are major headings that categorize the forester's observations and suggestions and should appear in the following order at the beginning of the plan:

- Cover page with the names, mailing addresses, and telephone numbers of the landowner(s) and preparing forester, along with the plan completion date and any revision date(s).
- General property description with the location, legal description, number of acres (forest & non-forest), type of ownership, and current land use.
- Topographic map showing property boundaries as fenced, painted, non-existent, etc.
- Forest type or stand map identifying the different management stands within the property (may be combined with boundary map)
- Optional: Tax map from the Assessor's office in the Court House.
- Colored soils map with legend (can be referenced here and placed in an appendix).
- Property map showing the locations of special features such as cemeteries, archeological sites, wetlands, streams, extensive rock outcrops, seeps, bat hibernacula, unique plant communities etc. It can be inserted or noted and placed in an appendix.
- Narrative assessment and description of the landowner's goals and objectives and specific relationships to the property. Minimal considerations are access, timber production, non-timber products, wildlife habitat, T & E species, soil and water protection, forest health, unusual fire danger, aesthetics, special sites, invasive species, integrated pest management recreational possibilities, and possible forest legacy easements. Optional considerations where present and relevant to the property and consistent with landowner's objectives include carbon, biomass, desired species, prescribed burning, wetlands, and high conservation value forests.

The following are described for each stand in order of importance:

- Stand by stand descriptions and special characteristics based on generally accepted forest inventory methods that can be replicated
- Stand history
- Past land use practices
- General stand age
- Cover type
- Stocking as trees per acre or basal area per acre or both
- Volume in board feet, cords, cubic feet or tons per acre according to product
- Growth rate
- Topography
- Presence of roads.
- Recommendations, including management practices, timber harvest discussion, protection, wildlife plots, if needed, and any reclamation plans including erosion and sedimentation control.
- Schedule of management activities at the stand level including alternative strategies, based on a discussion of landowner objectives.
- The final section, limited as much as possible, is the provision of supplemental materials. Any content in the final section should be referenced in the appropriate place within the body of the plan.

Modern Ecosystem and Landscape

The first step towards a healthy productive woodland owned by owner is a Forest Stewardship Plan. Such planning is modeled after the silviculturally-based plans prepared by forest industry entities for their lands. These larger companies have their own foresters. Most NIPF owners have smaller tracts and it is often a question in the owner's mind as to whether a plan will cost more than it produces. This is especially true when the landowner has very little knowledge of professional forestry. West Virginia's Forest Stewardship Program is a landowner assistance program specially developed for PNIF owners by the Division of Forestry with oversight and funding provided by the U. S. Forest Service. The purpose of the program is to assist the landowner with management expertise and information that will assist the landowner in attaining his objectives for owning the property. This, in turn, helps the State by keeping the forest healthy, providing wildlife habitat, enhancing natural beauty and adding to the local economy. The result is profitable for both sides.

Modern forest planning is often referred to or said to be "ecosystem" planning. An ecosystem is the complex of living organisms that occupy an area of interest. An older term was "microcosm." By whatever term, it is the plants, animals, fungi and microorganisms functioning together to circulate nutrients and create a flow of energy that in turn creates biomass. Ecosystems do not have boundaries fixed in time and space since they change depending on prevailing environmental factors. The scale depends on the purpose. An ecosystem can be a log, pond, field, forest or even the earth's biosphere. Simply put, it is the living and physical components of a specified area acting on and/or initiated by the component parts or more simply it's all of nature and the natural interactions on an area.

Acquiring a Forest Stewardship Plan

The first step in acquiring a forest stewardship plan is for the landowner to complete a forest stewardship plan application (Appendix B) and submit it to the WV Division of Forestry. Blank applications can be obtained from any Division of Forestry office, Service Forester or on line from the Division's web site. Participation is open to any private landowner, individual or otherwise, with at least 10 acres of forestland and perhaps lesser acreages in the case of community forests. The application has a planning worksheet that records your goals and visions for the property and thereby assists your forester in considering everything that you wanted in your plan. This worksheet has several check off questions concerning the ownership, the land, who works on the property, your willingness to invest in management procedures, your goals and your signature. The technical assistance protocol, including discussions on eligibility, enrollment and costs is detailed in Appendix C.

The second step is to engage an eligible Consulting Forester to prepare the plan. Such a forester is selected from a list of certified forest stewardship consulting foresters that is maintained on line at the Division of Forestry web site (wvforestry.com) or is available at any Division office. The published list is updated once each calendar year. The electronic list is updated monthly. It is also possible to have the plan prepared by the local Service Forester, who when contacted, will set a firm date for preparing the plan. It is to be recognized that Service Foresters have many responsibilities. The protocol followed by each type of preparer is provided in Appendix D.

Descriptions and examples of forest stewardship plan components are provided in Appendix E. This includes detailed plan preparation format and contents, cover page, introduction letter, statement of landowner intent with signatures, activity record table, cruise intensity guide, general inventory information table, stand management summary table, and 10-year proposed activity schedule. If cost sharing is involved, plan revisions must follow the specific guidelines detailed in Appendix E. Appendix F provides forms needed for consulting forester registration and checklist of requirements for the payment of services

Appendix A
PROGRAM ADMINISTRATION

A. Coordinating Committee

The West Virginia Forest Stewardship Coordinating Committee shall provide technical, procedural and logistical recommendations to the State Forester who is responsible for the administration of the Forest Stewardship Program.

Objectives

- To recommend updates for program policies, procedures and standards contained in the State Forest Stewardship Operating Plan as necessary.
- To recommend strategies to enhance the success of the program.
- To provide input to the administering agencies from a wide variety of natural resource related interests.
- To facilitate the coordination of efforts among the administering agencies.
- To incorporate private natural resource concerns in program implementation.
- To provide input on program activities to complement those of existing programs, such as Tree Farm and Federal Farm Bill Programs.
- To generate widespread support for the program from forest landowners, concerned groups and the general public
- To assist in establishing annual training schedules for forestry professionals

Membership

The Division of Forestry, Assistant State Forester for Forest Management and Stewardship serves as facilitator. Individuals from the following agencies or groups may serve on the coordinating committee:

WV Division of Forestry
WV Division of Natural Resources
WV Farm Bureau
WV Department of Agriculture
WV Conservation Agency
Organization USDA Natural Resources Conservation Service
USDA Farm Service Agency
USDA Forest Service
WV Department of Environmental Protection
West Virginia University
West Virginia Forestry Association
WV Association of Consulting Foresters
WV Association of Conservation Districts
Private Environmental
Forestry Consultants
Forest Industry
Private, Non-industrial Forest Landowners

Agencies and groups shall choose their own representatives. The State Forester may seek additional representation from the other member categories mentioned above, as necessary.

Schedule of Meetings

The committee will meet four times a year, at a location to be decided in advance. The Division of Forestry shall schedule meetings, notify members, notify the Secretary of State to satisfy public notification regulations, make logistical arrangements and develop an agenda.

Recommendations to the State Forester

A quorum will consist of representatives from at least nine of the members. Recommendations to the State Forester shall be made by consensus, wherever possible. The State Forester shall evaluate group decisions to ensure that they are consistent with the goals of the program.

B. Subcommittees

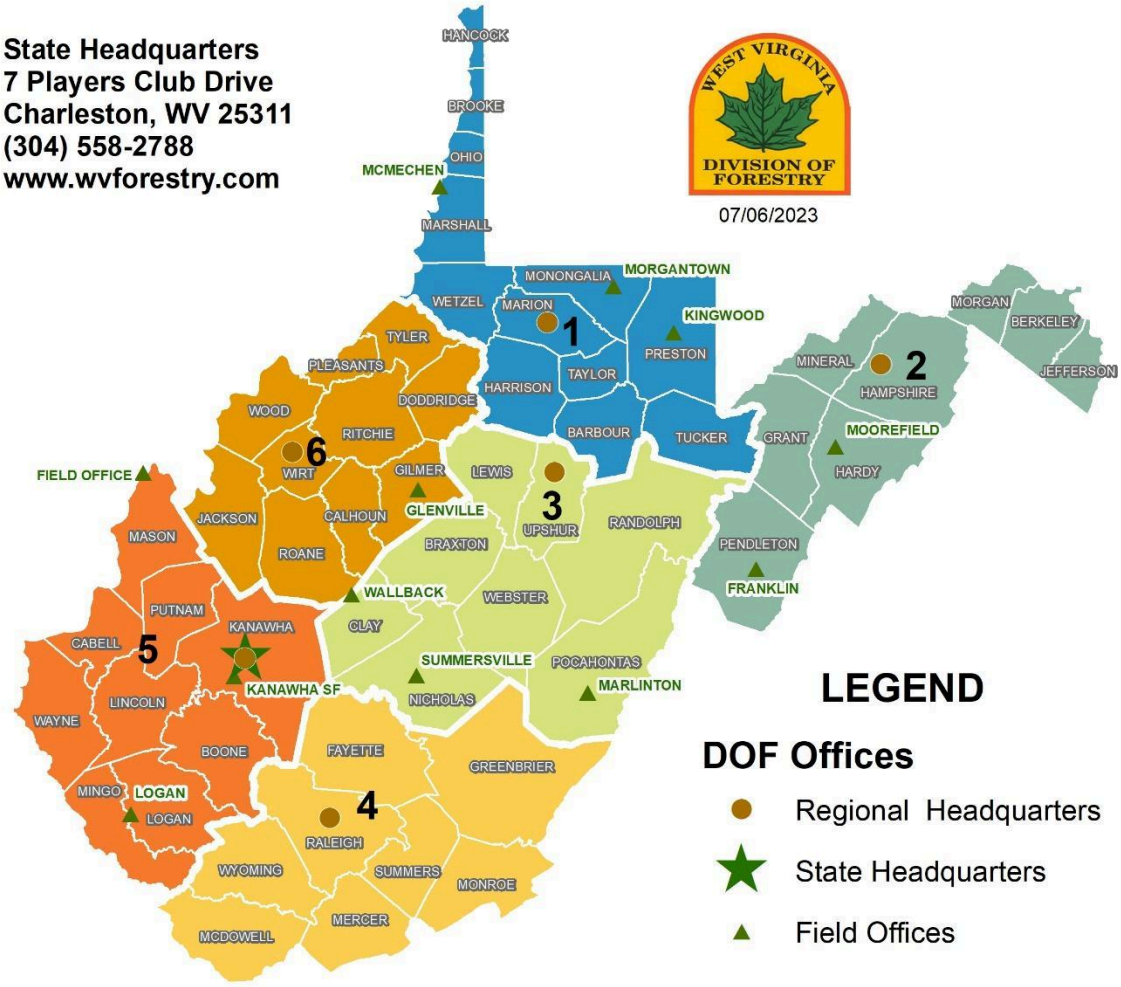
When necessary, representatives from the coordinating committee may be asked to serve on a technical subcommittee to complete more detailed work. Subcommittee findings and recommendations must come before the entire Forest Stewardship Committee for approval before final recommendations are made to the State Forester.

C. WVDOF
Responsibilities

1. Overall program administration.
2. Promotion of the Program, enlisting program participants and developing Forest Stewardship Management Plans
3. Coordination of landowner technical assistance efforts and management plan preparation with the private forestry community.
4. Accomplishment reporting to the USDA Forest Service and the Forest Stewardship Coordinating Committee.
5. Nomination and review of properties for potential "Stewardship Forest" certification.
6. Informational and educational material development in conjunction with WVU.

West Virginia Division of Forestry

State Headquarters
7 Players Club Drive
Charleston, WV 25311
(304) 558-2788
www.wvforestry.com



Region 1 Headquarters
Farmington Office
P.O. Box 40
(Street Address:
1106 Railroad Street)
Farmington, WV 26571
(304) 825-6983

Region 2 Headquarters
Romney Office
1 Depot Street
Romney, WV 26757
(304) 822-4512

Region 3 Headquarters
Buckhannon Office
61 Fifth Street
Building 1, Suite 201
Buckhannon, WV 26201
(304) 439-3003

Region 4 Headquarters
Beckley Office
330 Harper Park Drive,
Suite J
Beckley, WV 25801
(304) 256-6775

Region 5 Headquarters
Charleston Office
1900 Kanawha Blvd E.
Charleston, WV 25305
(304) 743-6186
(304) 558-2788

Region 6 Headquarters
Elizabeth Office
P O Box 2
25 Schoolview Street
Elizabeth, WV 26143
(304) 275-0261

Appendix B

WEST VIRGINIA FOREST STEWARDSHIP PROGRAM PLAN APPLICATION

APPLICANT (PLEASE PRINT**)**

Last Name:_____ First Name:_____ MI:_____

Street Mailing Address:_____

City:_____ State:_____ Zip Code: _____

Telephone - Home:_____ Work:_____ Cell _____

E-mail Address: _____

PROPERTY INFORMATION

1. County:_____ 2. Property Location: _____

3. Topographic Map Quadrangle (name): _____

4. UTM's (or Longitude/Latitude) for Property: _____

5. **Total** Property Acres:_____ 6. **Estimated** Forested Acres* _____

7. Deed Book & Plat No.: _____ Tax Map & Parcel No. _____

8. Are property lines marked? Yes_____ No_____ If not, are they known? Yes_____ No_____

9. Will the owner or representative be available to accompany a forester on a brief reconnaissance? Yes_____ No_____

10. Does the forest land have roads into and through it? Yes_____ No_____

12. Has the property owner received previous forestry assistance? Yes_____ No_____

If yes, what?_____

13. Have you ever sold timber or other forest products from your woodland? Yes_____ No_____

If yes, what?_____

Are you interested in learning more about the Tree Farm program? Yes_____ No_____

LANDOWNER PRIORITIES (RANK FROM 1 TO 3 – 1 BEING HIGHEST PRIORITY)

_____ Timber Management (Growing timber products)
_____ Soil and Water Conservation
_____ Wildlife Management
_____ Aesthetics
_____ Recreation
_____ Agroforestry

_____ Other (specify) _____

I hereby agree to implement, to the best of my ability, the Forest Stewardship Plan prepared for my property.

(Signature of Properly Owner) (Date)

I have contacted the following Consulting Forester/DOF Service Forester to prepare my Forest Stewardship Plan.

(Name of Consulting Forester / DOF Service Forester) (Telephone Number)

(Company/Agency Name and Mailing Address)

OPTIONAL – Topographic map of the property if available. ***BETTER TO OVER ESTIMATE**

MAIL THE COMPLETED APPLICATION TO YOUR SERVICE FORESTER FOR THE COUNTY IN WHICH YOUR PROPERTY IS LOCATED. SEE THE ATTACHED LISTING FOR THIS MAILING INFORMATION.

Privacy Notice: The West Virginia Division of Forestry collects and process certain personal information as needed for appropriate and customary business purposes. Personal information may be disclosed to other State agencies of third parties as necessary in the normal course of business or to comply with federal or state laws, including Freedom of Information Act requests. If you have questions about our use of personal information, please contact us at 304-558-2788. Revised 3/23

FOREST STEWARDSHIP PROGRAM PLAN APPLICATION INFORMATION

1) Before signing the plan application for cost share assistance for a Stewardship Plan you must select a certified consultant forester to write your plan. See the list of Certified Consultant Foresters on our website www.wvforestry.com approved to prepare Forest Stewardship Plans in West Virginia.
2) Verify with the selected Consultant Forester that he/she is willing to write your plan within the time frame. Forest Stewardship Management Plans must be completed within TWELVE (12) MONTHS OF THE APPROVAL DATE. Failure to submit a Consultant Forester prepared plan and the cost share reimbursement forms to the Division of Forestry by the due date will result in forfeiture of any reimbursement payment.
3) Do not sign a contract with a Consultant Forester to prepare your plan UNTIL you have received a written approval letter from the West Virginia Division of Forestry.
4) Upon receipt of the completed Stewardship Plan Application at the Division of Forestry, pending available funding, a grant will be written to the Consultant Forester agreeing to pay 75% of the approved cost of your Forest Stewardship Management Plan. The approved rate used for the Forest Stewardship Management Plan is as follows: $600.00 for Cost of Plan plus $6.50 per forested acre. Non forested acres will not be cost shared.

Example for 10 Forested Acres
Formula: $600.00 + ($6.50 x 10 acres) = $665.00

	New Plan
Total cost of plan	$665.00
State Reimburses Forester	$498.75 (75%)
Final Landowner Expense	$166.25 (25%)

Example for 100 Forested Acres
Formula: $600.00 + ($6.50 x 100 acres) = $1250.00

	New Plan
Total cost of plan	$1250.00
State Reimburses Forester	$937.50 (75%)
Final Landowner Expense	$312.50 (25%)

Private Consultant Foresters may charge more than the approved rate. However, forester reimbursements will not exceed the approved acreage rate. Any additional Consultant Forester Fees will be the responsibility of the landowner.

Upon approval of the plan the Division of Forestry will notify you by letter with a copy to your Consultant Forester of the qualifying acres approved for payment.

WEST VIRGINIA DIVISION OF FORESTRY
SERVICE FORESTERS

REGION 1		
Forester	County	Address & Phone Number
Brent Lyons Brent.G.Lyons@wv.gov	Hancock, Brooke, Ohio, & Marshall north of route 250	USDA Service Center 1 Ball Park Drive McMechen, WV 26040 304-238-1029 304-546-2275 cell phone
vacant	Wetzel & Marshall south of route 250	PO Box 40 Farmington, WV 26571 304-825-6983
Anne Kinkopf anne.m.kinkopf@wv.gov	Marion, Taylor	PO Box 40 Farmington, WV 26571 304-825-6983 Cell phone304-502-3383
Mike Boyce Michael.S.Boyce@wv.gov	Monongalia	Mont Chateau Research Center 1 Mont Chateau Road Morgantown, WV 26508-8079 304-502-2269 Cell phone
Mike Reese John.M.Reese@wv.gov	Preston & Tucker	PO Box 40 Farmington, WV 26571 304-825-6983 304-380-1518 cell phone
Dan Cooley Daniel.P.Cooley@wv.gov	Barbour, Harrison	PO Box 40 Farmington, WV 26571 304-825-6983 304-541-8126 cell phone

REGION 2		
Forester	County	Address & Phone Number
Todd Carnell Todd.P.Carnell@wv.gov	Mineral	1 Depot Street Romney, WV 26757 304-822-4512 304-703-5546 cell phone
Curtis Betty Curtis.A.Betty@wv.gov	Pendleton	PO Box 245 Franklin, WV 26807 304-703-1897 cell phone
Jarred Kinlein Jarred.R.Kinlein@wv.gov	Berkeley, Morgan, Jefferson	1 Depot Street Romney, WV 26757 304-822-4512 office 304-490-5993 cell phone
James Johnson james.b.johnson@wv.gov	Hampshire	1 Depot Street Romney, WV 26757 304-822-4512 304-703-2079 cell phone
Isaac Bergdoll Isaac.K.Bergdoll@wv.gov	Grant	60 B Industrial Park Road Moorefield, WV 26506 304-538-2397 office 304-703-9716 cell phone

Christopher Kesner christopher.j.kesner@wv.gov	Hardy	60 B Industrial Park Road Moorefield, WV 26506 304-538-2397 office 304-703-4099 cell

REGION 3		
Forester	County	Address & Phone Number
Danny James Danny.L.James@wv.gov	Lewis, Upshur	61 5th St Building 1 Suite 201 Buckhannon, WV 26201 304-712-5627 cell phone
Johnny King Johnny.L.King@wv.gov	Braxton	PO Box 187 Summersville, WV 26651 304-872-0830 304-534-2328 cell phone
Joe Jelich Joe.S.Jelich@wv.gov	Clay	PO Box 2/25 Schoolview St. Elizabeth, WV 26143 304-275-0261 304-380-3574 cell phone
Curtis Helton J.Curtis.Helton@wv.gov	Pocahontas	PO Box 345 Marlinton, WV 24954 304-799-6151 304-380-3781 cell phone
Mitch Gruver mitchell.c.gruver@wv.gov	Randolph	61 5th St Building 1 Suite 201 Buckhannon, WV 26201 304-439-3003 office phone (304) 618-9463 (Cell)
Jack Spencer Jack.J.Spencer@wv.gov	Nicholas	PO Box 187 Summersville, WV 26651 304-872-0830 304-731-6138 cell phone 304-731-6138 cell phone
Cole Kalna Cole.Z.Kalna@wv.gov	Webster	240 South Main Street Suite 101 Webster Springs, WV 26288 (304) 406-2857 (Cell)
REGION 4		
Forester	County	Address & Phone Number
Vacant	Fayette	330 Harper Park Drive, Suite J Beckley, WV 25801 304-256-6775
William “Craig” Okes W.Craig.Okes@wv.gov	Summers	Court House Annex 120 Ballenger St. Suite 207 Hinton, WV 25951 304-466-2799 304-546-5095 cell phone
Mat Bailey Mathew.W.Bailey@wv.gov	Region Wide Forester	330 Harper Park Drive, Suite J Beckley, WV 25801 304-256-6775 304-731-6250 cell phone

Vacant	Monroe	717 N. Jefferson Street Lewisburg, WV 24901 304-647-7425
Vacant	Mercer, McDowell, Wyoming	330 Harper Park Drive, Suite J Beckley, WV 25801 304-256-6775 304-731-0496 cell phone
Anthony Kesterson Anthony.W.Kesterson@wv.gov	Greenbrier	717 N. Jefferson Street Lewisburg, WV 24901 304-647-7425 304-380-3398 cell phone
Mark Hudnall Mark.D.Hudnall@wv.gov	Raleigh	330 Harper Park Drive, Suite J Beckley, WV 25801 304-256-6775 304-894-7491 cell phone

REGION 5		
Forester	County	Address & Phone Number
John Holden john.b.holden@wv.gov	Kanawha	130 Rattlesnake Run Charleston, WV 25314 304-558-1264
Michael Dolin Michael.I.Dolin@wv.gov	Boone, Logan	PO Box 645 Holden, WV 25625 304-239-2055 304-380-1532 cell phone
Craig Elswick Craig.A.Elswick@wv.gov	Cabell	PO Box 189 Milton, WV 25541 304-743-6186 304-894-2696 cell phone
Ian Smith Ian.T.Smith@wv.gov	Putnam	624 Forestry Drive West Columbia, WV 25287 304-675-6626 304-380-8271 cell phone
H. Larry Six H.Larry.Six@wv.gov	Mason & Mingo	624 Forestry Drive West Columbia, WV 25287 304-675-6626 304-380-7490 cell phone
David Turnipseed Davis.S.Turnipseed@wv.gov	Lincoln	PO Box 189 Milton, WV 25541 304-743-6186 304-380-6428 cell phone
Matt Cook Matthew.C.Cook@wv.gov	Wayne	PO Box 189 Milton, WV 25541 304-743-6186 304-550-7389 cell phone

REGION 6		
Forester	County	Address & Phone Number
Vacant	Ritchie	PO Box 2 25 Schoolview St. Elizabeth, WV 26143 304-275-0261 cell phone
Jon Wilson Jon.T.Wilson@wv.gov	Pleasants, Tyler	PO Box 2 25 Schoolview St. Elizabeth, WV 26143 304-275-0261 304-389-3831 cell phone
Jordan Stewart	Jackson, Wood	PO Box 2 25 Schoolview St. Elizabeth, WV 26143 304-275-0261 Cell Phone
Jesse King Jesse.L.King@wv.gov	Gilmer, Calhoun	PO Box 2 25 Schoolview St. Elizabeth, WV 26143 304-275-0261 304-488-9157 cell phone
	Wirt	PO Box 2 25 Schoolview St. Elizabeth, WV 26143 304-275-0261 304-206-0403 cell phone
Cody Adkison Cody.C.Adkison@wv.gov	Doddridge	PO Box 2 25 Schoolview St. Elizabeth, WV 26143 304-275-0261 681-417-8987

UPDATED 4/17/2024

VENDOR REGISTRATION INSTRUCTIONS

First down load the most current form, obtained via this link:
http://www.state.wv.us/admin/purchase/vrc/WV1A.pdf

Responses are required in all sections of the WV1A, unless otherwise noted

Section 1: Enter landowner name, address, and telephone number on the appropriate lines. (Fax Number is optional)

Section 2: Check 'Individual' unless another classification is more appropriate.

Section 3: Enter social security number (second row) unless the landowner has a FEIN number (first row).

Section 4: Check appropriate box, if applicable.

Section 5: Register on-line if necessary

Section 6: Not Applicable

Section 7: Check appropriate box.

The Consultant must sign name in BLUE INK, list title, and date the form (Page 5)

You will also need to submit a current W-9 form, obtained via this link:
https://www.irs.gov/pub/irs-pdf/fw9.pdf

Rev. 02/24

S:\shared\FOREST MANAGEMENT\FOREST STEWARD SHIP\VENDOR REGISTRATION INSTRUCTIONS

Appendix C
TECHNICAL ASSISTANCE PROTOCOL

1. ELIGIBILITY

NIPF landowners who own at least 10 acres of qualifying forestland and have a desire to manage their property according to the program standards may participate in the Forest Stewardship Program. To qualify, forest land must have existing tree cover or other woody vegetation, or suitable to grow such vegetation, and be owned by an individual, group, association, private corporation, or other legal private entity.

Landowners who are interested in the Forest Stewardship program must enroll their entire contiguous property into the program; however open pasture, cropland, or water body acreage will not be eligible for plan preparation cost share assistance.

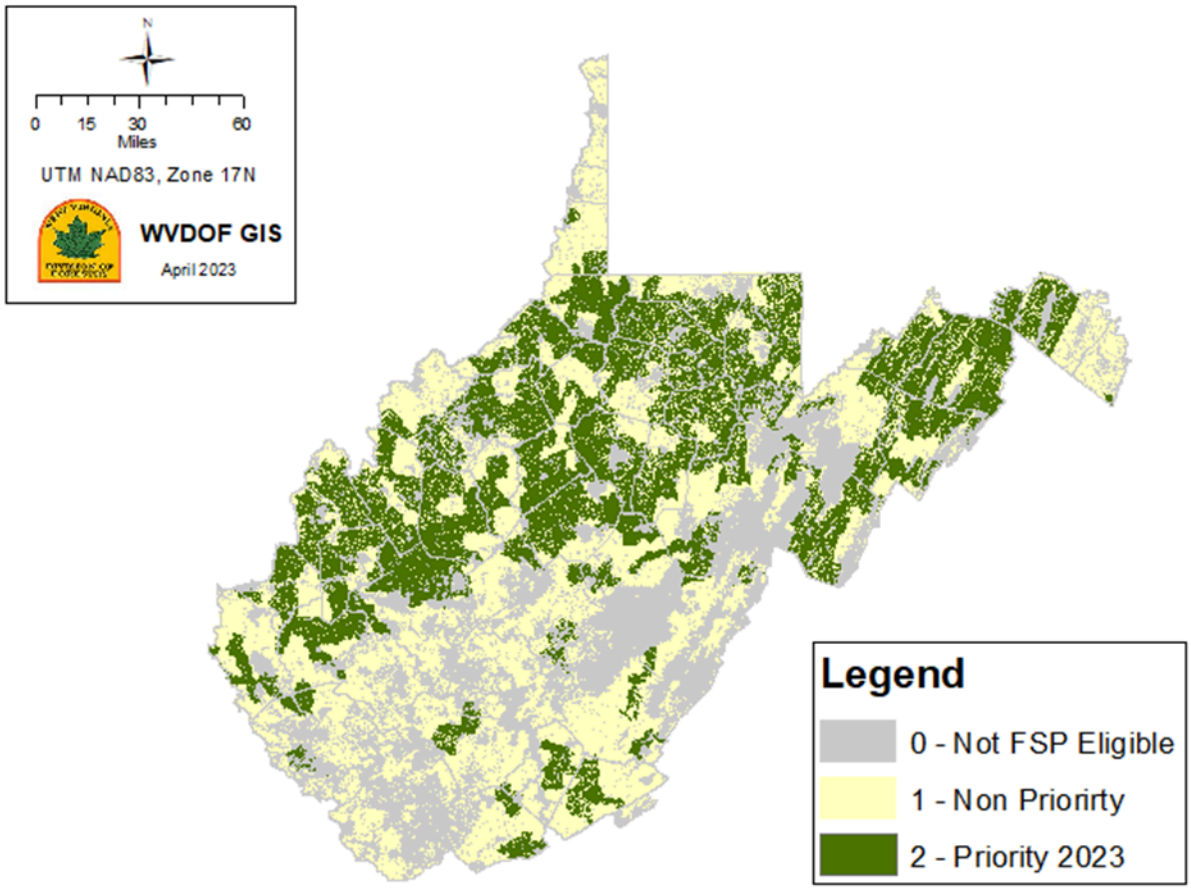
To prioritize federal investment and demonstrate the positive impact states are having on private forest land, NASF leadership and the Forest Service in January 2019 agreed Forest Stewardship priority areas will be no more than 50% of total eligible Forest Stewardship acres.
To assist the states in their efforts, a spreadsheet was shared among states with the calculated 50% priority acreage based on USDA and Forest Service estimates. West Virginia's estimated Agriculture land potential is based on USDA highly erodible agriculture land data. The Forest Service and USDA agreed that no more than 10% of highly erodible ag land is eligible for the Forest Stewardship program and can be converted to forests, riparian forest buffers or other agroforestry practices. Total NIPF Acres Holdings of 10 or more acres is based on Brett Butler's National Woodland Owner Survey 2011-2013 data. The data is derived from Forest Inventory Anaylisis plot data collected by state forestry agencies. Total Potential Forest Stewardship Acres is the total of Ag Land Potential and Total NIPF Acres. The 50% of eligible acres column is half of the Total Potential Forest Stewardship Acres. Compared to WVDOF estimates where total potential Forest Stewardship Acres were higher by 1.1 million acres in total, and 107,033 acres for NIPF as shown in Table 1.1.

FS/FIA	Ag Land Potential	Total NIPF Acres	Total Potential Forest	FS/FIA B. Butler Est. Ac.
Brett Butler	10% Erodible Ag Land	Holdings > 10 Acres	Stewardship Acres	50% of Total for Priority
Estimates	434,600	9,721,000	10,155,600	5,077,800
WVDOF	Private Low Vegetation Class*	All NIPF Lands*	Total FSP Potential	WVDOF Priority Areas
Estimates	1,444,008	9,828,033	11,272,041	5,071,718

Table 1.1: USDA and WVDOF estimates for potential Forest Stewardship Program acres (USDA FS email communications, WVDOF GIS 2020).

* Latest available GIS data for land ownership area classes classified as – airports, urban areas, company lands, mine lands, tax exempt, protected lands, and public lands were removed from total 2016 forestland and low vegetation landcover acreage.

A revision in 2023 priority areas uses a revised ranking scheme based on HUC-12 watershed boundaries with summarized data mostly from *Forests to Faucets 2.0*, importance for drinking water study stats and rankings. Additional priority datasets used included percent of HUC-12 watershed area statistics for current and historical Forest Stewardship Program areas, FIA high forest productivity areas, TNC's resilient areas, WVDNR SWAP priority areas, Wildland Urban Interface, Managed Timberland tax program acres, core forest areas, NIDRM forest health risk, and NIPF acres. A total of 311 watersheds were identified totaling 5,071,718 NIPF acres for the Forest Stewardship Program's primary focus, i.e. "priority area", until the next plan update, is shown in Map 3.9. This new priority area is within 6,082 acres of the FS target acreage established in 2020 of 5,077,800 acres.is shown in Map 1.1.



Map 1.1 Forest Stewardship Federal Investment Area

2. PROGRAM ENROLLMENT

Landowners who are interested in the Stewardship Program should visit their local WVDOF Service Forester, the Division of Forestry website at www.wvforestry.com or a participating certified Forest Stewardship Consulting Forester to learn more about the program. It is the responsibility of the agency representative and/or consultant to carefully explain to each landowner the benefits of the program and the procedures involved in the development of their Forest Stewardship plan.

Landowners should also understand that the purpose of the program is to encourage *active forestland management*. This includes measures to increase timber growth, improvement of wildlife habitat and opportunities for recreational pursuits, ***but not necessarily public access for recreation***.

To be eligible landowners must obtain and complete a Forest Stewardship Program Application and send it to their appropriate Service Forester. If a consultant is selected to develop the plan, a Vendor Registration and Disclosure Statement form, and a W-9 Request for Taxpayer Identification Number and Certification form must also be submitted by the consultant to become registered in the WV OASIS system.

- After reviewing the application and paperwork the Service Forester will initial and date the application. The Service Forester will send the original application form, to the State Office.

The Stewardship Application is needed for accounting purposes for cost-shared plans. If the Service Forester will be preparing the plan, landowner information will be recorded on the Record of Request Ledger.

3. STEWARDSHIP PLAN WRITER CERTIFICATION

Professional foresters and technicians, licensed in West Virginia, who want to be included on the Certified Forest Stewardship Consulting Forester list and be eligible to prepare Forest Stewardship plans must attend training sessions sponsored by the Forest Stewardship Program each State fiscal year, (July 1 — June 30). With the onset of CoVid, classes are offered online monthly through Zoom classes. Participants will need to take ten (10) hours of a combination of Zoom classes and in person trainings to meet the training qualifications. Other training sessions such as, Society of American Foresters meetings, Tree Farm trainings, WV Board of Registered Foresters trainings, or other trainings preapproved by the WV Stewardship Program Coordinator can also be counted toward the 10 hours of required training. The training sessions are designed to provide continuing education for professional foresters, Society of American Foresters Continuing Forestry Education (CFE) credits, and an opportunity to relay program administration information to participating Consulting Foresters and WVDOF foresters. All WVDOF Regional Foresters, Assistant Regional Foresters, and Service Foresters are also required to complete the training requirements.

4. CONSULTING FORESTER INVOLVEMENT

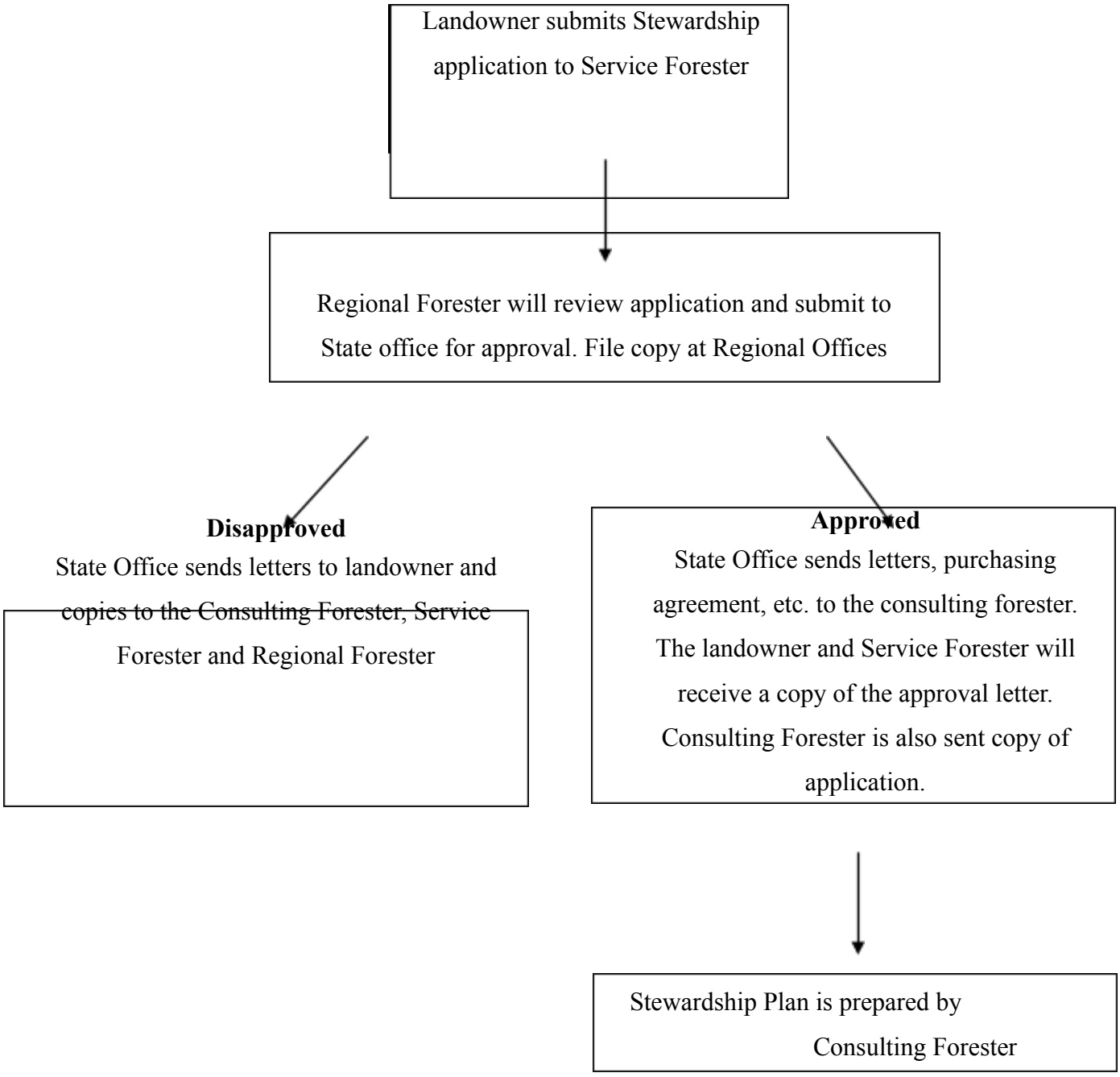
Landowners who wish to have a certified Forest Stewardship Consulting Forester write their plan must follow the procedures listed below. The landowner must receive written approval from the WVDOF prior to allowing the Consulting Forester to begin reconnaissance work on the property.

APPROVAL PROCEDURE

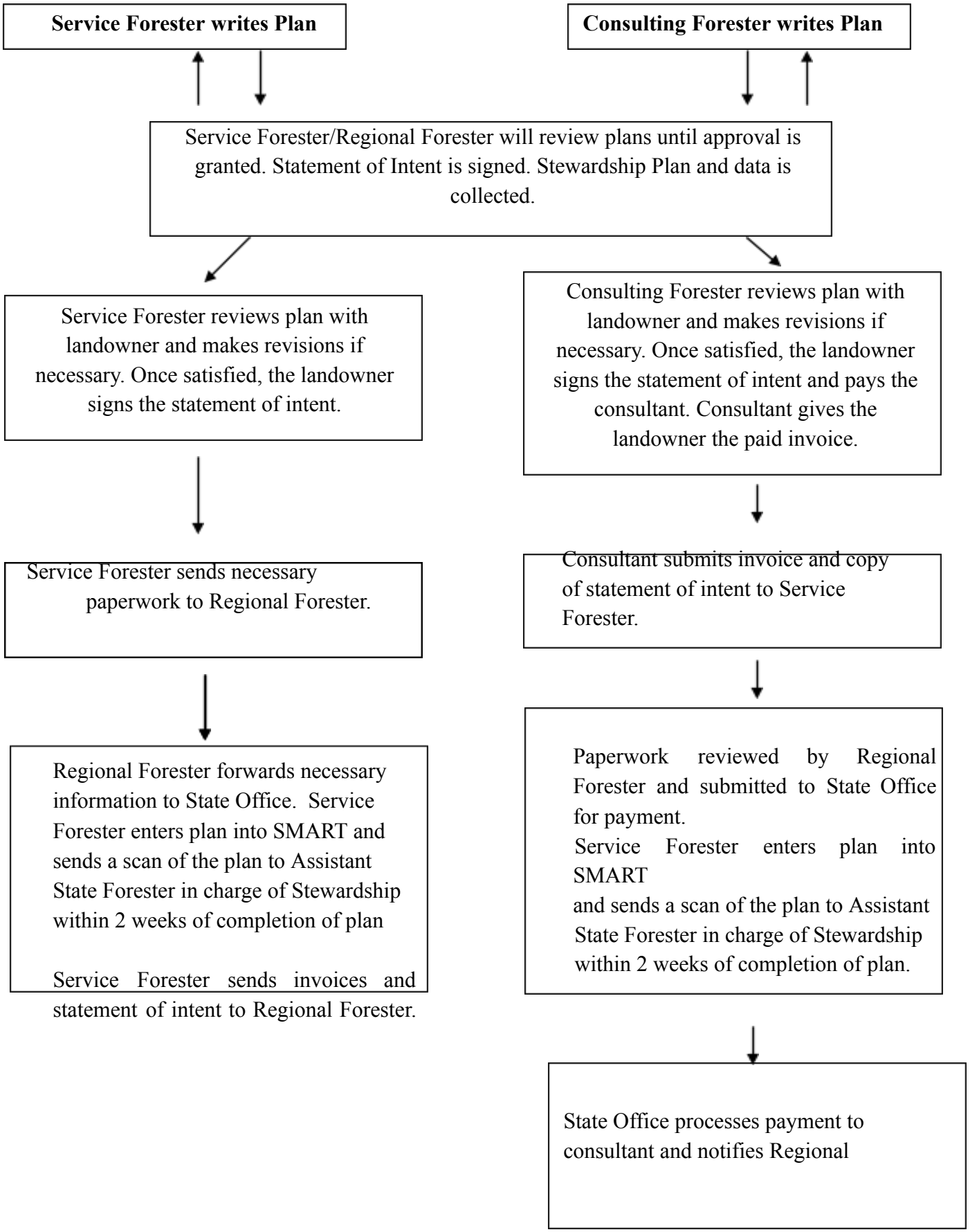
1. The landowner must complete, sign and submit 1) the Stewardship Application form, to the Service Forester. The landowner should include the Consulting Forester's name at the bottom of the application. The Service Forester will review the application to insure that the form is completed correctly. If it is correct, the Service Forester will initial and date and then send the paperwork to the State Office and retain a copy for their files.
2. The State Office will check to see if the consultant is on the Certified List and if there is sufficient funding to approve the plan preparation reimbursement.
3. Once the Purchasing Division assigns a vendor number, the consultant will be sent an agreement to sign and return to the Division's State Office. A counter signed purchasing agreement will then be sent with an approval letter and an invoice form to the Consulting Forester, with copy to the landowner, the Service Forester will receive a copy of the approval letter. The Consulting Forester will also receive a copy of the Stewardship Application. (**Any time spent by the Consulting Forester on the plan prior to receiving the approval letter will be at the landowner's or consultant's expense**.)
4. The Consulting Forester will have up to twelve (12) months from the date of the approval letter to submit the reimbursement paperwork to the DOF State Office. **Consulting Foresters who do not submit the required paperwork to the DOF State Office by the due date will forfeit any plan reimbursement payment.**
5. If the Consulting Forester fails to complete the plan in a timely manner, which causes the landowner to miss the due date, the landowner may select another Consulting Forester to prepare the plan and re-apply.
6. The Consulting Forester reimbursement paperwork must contain:

    - The signed Consulting Forester Invoice which was previously sent to the Consultant along with the signed statement of intent from the Stewardship Plan.

CONSULTING FORESTER INVOLVEMENT FLOW CHART



STEWARDSHIP PLAN COMPLETION FLOW CHART



Forester and Service Forester.

APPENDIX D
Consulting and Foresters Protocols

1. INITIAL RECONNAISSANCE

The primary plan preparer arranges a meeting at the landowner's property, where the landowner, or landowner agent, meets with the natural resource specialists to discuss their management objectives and briefly tour the property. A Consulting Forester may act as the landowner's agent if the landowner cannot attend the initial reconnaissance. If a consultant is preparing the plan, the specialists shall consist of the consultant and any other professionals (if necessary) to address the landowner's needs and objectives. The Service Forester may participant at the landowner's and/or the consulting forester's request.

Other professionals who may be contacted to see if they are able to attend the reconnaissance include the following:

(NRCS): If an *erosion problem or a potential erosion problem exists* that is to be corrected, or the landowner wishes to conduct a practice *in an area designated as a wetland*.

WVU Extension Agent: If *woodland grazing* is to be a part of the management plan, or the landowner wishes to pursue management of other specialty forestry products where the extension agent may have some specialized knowledge or information.

WV Conservation Agency: For conservation in general.

Other Specialists: Examples may include a fisheries or wildlife specialist from the Division of Natural Resources, who can contribute specialized information to the plan.

The other professionals do not have to be present during the initial visit. The primary author can arrange for their input or to visit the site at a future date.

This initial reconnaissance visit provides landowners with an opportunity to explain their goals, as well as an opportunity to identify any specific practices and concerns. The resource professionals exchange ideas with the landowner and make observations about the property to determine how and where to carry out the practices identified by the landowner.

2. PLAN PREPARATION IF CONSULTANT IS NOT INVOLVED

The Service Forester will take the responsibility for preparing the plan. The initial reconnaissance will be done by the Service Forester and any other professionals (if necessary) to address the landowner's needs and objectives.

If the Stewardship plan involves a multi-county ownership, the Service Forester with the majority of the property falling in his/her county, will coordinate the plan preparation process. If a Service Forester position is vacant, or the Service Forester is unable to develop the plan due to other circumstances, the Regional Forester will assign another Service Forester from their Region to prepare the plan.

3. CONSULTING FORESTER PREPARED PLAN

a. The Consulting Forester meets with the landowner and other professionals as needed on the property, develops and sends a draft of the plan with maps, appendices and cruise data summaries to the Service Forester for review and comments.
b. The Consulting Forester works with the Service Forester to incorporate the comments/suggestions into the final plan, before reviewing it with the landowner. If necessary, the Service Forester will have the associated specialists review the plan.
c. Once the plan meets DOF standards, the Service Forester will keep a copy of the plan as well as sign in triplicate in blue ink and return the Statement of Landowner Intent to the Consulting
Forester.
d. The consulting forester reviews the final plan with the landowner. If any changes are made to plan after the landowner reviews it, the consulting forester will send the revised pages to the Service Forester. Once satisfied with the plan, the landowner signs in triplicate in blue ink the statement of intent. The consultant is not paid by the landowner until the landowner signs the statement of intent.
e. Once the Consulting Forester is paid, he or she will send the consulting forester's paid invoice to the landowner indicating payment has been received.
f. The Consulting Forester–will submit the invoice and a copy of the signed Statement of Landowner Intent form to the Service Forester.
g. The Service Forester will send the invoice, signed statement of intent, and a copy of the plan to the Regional Forester. The Regional Forester will review all information sent by the Service Forester and forward it to the designated State Office.
h. The Regional Forester will review all information sent by the Service Forester and forward it to the designated State Office.
i. The State office will see that the payment is processed.

4. SERVICE FORESTER PREPARED PLAN

a. The Service Forester meets with the landowner on the property, then develops the plan and sends a draft of the plan with maps, appendices and cruise data summaries to the Regional Forester for review and comments.
b. The Service Forester works with the Regional Forester to incorporate the comments and suggestions into the final plan. Once the plan meets DOF Standards, the Regional Forester will sign in triplicate, in blue ink, the Statement of Landowner Intent.
c. The Service Forester will review the completed plan with appropriate maps and appendices with the landowner. If any changes are made to the plan after the landowner reviews it, the Service Forester will send the revised pages to the Regional Forester. Once satisfied with the plan, the landowner signs in triplicate in blue ink the Statement of Landowner Intent.
d. The Service Forester will forward an original signed Statement of Landowner Intent, and a copy of the entire Stewardship Plan, the supplemental contents are optional, to the Regional

Forester, who will review all the information sent by the Service Forester and forward it to the State Office.

e. The Service Forester will then enter the plan in SMART and file the plan in the county files.

5. FUTURE PLAN REVISION OR ADDENDUMS

Landowners may request a revision or addendum to their Forest Stewardship Plan under the following circumstances:

- Ten years following the plan's original completion date
- Change in ownership and/or objectives
- Additional acreage has been added to the original parcel

New plan requests due to landownership changes will be paid at the regular plan preparation rates. All acreage addendums and new plan requests will be subject to approval by the Assistant State Forester.

6. PLAN REVISION AND ADDENDUM PROCEDURES

Revisions and addendums must follow the plan preparation procedures as established in this operating plan.

For cost share, the landowner must complete another Forest Stewardship Plan application form and send it to the Service Forester. The Service Forester will forward it to the Regional Forester who will then forward it to the designated State Office. The word "REVISED" must be written in bold letters on the top of the application. If a consultant is involved, the Consulting Forester must first receive the approval letter from the designated State Office before the consultant begins the fieldwork.

As a minimum, updates to the following plan components must be included in Forest Stewardship Plan revisions. These updates should be either incorporated into the previous plan or attached to the plan as an addendum.

1. Title Page - Same format as the original, plus the wording "Revised Plan".
2. Introductory Page - Including a short paragraph stating the reasons for the plan update, defining the scope of the update (i.e. what is included within the update, and the landowner's management objectives.)
3. Updated Table of Contents page that includes the plan update as an addendum to the original plan.
4. Updated forest type map - computer generated if possible, including any new acreage, roads, or change in stand types.
5. Updated topographic map computer generated if possible, including boundary lines and UTMs or Latitude and Longitude coordinates.
6. Updated stand descriptions if the stand characteristics or recommendations have changed due to management activities or landowner objectives. (Cruise information, cruise data summaries and general cruise data tables, must also be updated if the stand characteristics have changed dramatically due to natural or man-made disturbances.)
7. Updated 10-year timeline for entire plan acreage.
8. Include most current information on Forest Health, General Management, Recommendations, Harvesting Recommendations, Wetland and Riparian Zones, Threatened and Endangered Species and a new activity record form.

7. PROGRAM ACCOMPLISHMENT REPORTING

For all completed and approved plans, the Regional Forester will send scanned copies of the entire plan, including the signed statement of intent, to the DOF state office.

This information will be placed on the WVDOF's shared drive.

8. AFTER THE PLAN IS COMPLETED

The Consulting Forester or the Service Forester will contact the Forest Stewardship landowner to encourage and help them begin implementing the plan's recommended practices. They will also direct them to potential sources of financial assistance such as the ***Environmental Quality Incentives Program (EQIP), Conservation Reserve Program (CRP), or Conservation Reserve Enhancement Program (CREP)*** should funding be available. If necessary, they shall return to the site to provide additional technical assistance. They may also help landowners find contractors to perform the work or materials and supplies to do the work themselves.

APPENDIX E
Components of a Forest Stewardship Plan

PLAN PREPARATION FORMAT AND CONTENTS

A forest stewardship management plan is a multiple-use document which contains integrated strategies for managing each of the major resource components on the landowner's property over a ten-year period. Resource specialists from the administering agency and the private sector contribute to the plan. All forested property is included.

The landowner shall rank their first three objectives for the property, while providing for each of the other objectives in a compatible manner. With the landowner's objectives known, the professional forester can refer to the appropriate minimum standards and basic guidelines when developing the plan. The following components constitute the minimum information that must be included in all plans.

Use 8 ½ x 11 white 20 lb. bond paper. This weight paper should also be used for all maps. Final product must be delivered, faxed, emailed, or mailed to the Service Forester.

1. COVER PAGE (*see sample in appendix F*)
The cover page shall include bold text identifying the plan as a **Forest Stewardship Plan**: the landowner's name, address, telephone number, and the county where the property is located; the name, address phone number, WVRPF # of the professional forester who prepared the plan; preparation date, expiration date, and total plan acreage.

2. INTRODUCTION LETTER (*see sample in appendix F*)
Briefly explains the importance of good forest management, management planning and how their Forest Stewardship plan is organized. This letter congratulates the landowner for entering the Forest Stewardship Program.

3. STATEMENT OF LANDOWNER INTENT (*see sample in appendix F*)
Once the plan is completed, this page will include the signatures of the *landowner, DOF Service Forester, Consulting Forester (if involved) and Regional Forester* if it is a state prepared plan. A plan is considered complete only after the signed Statement of Landowner Intent page is sent to the Assistant State Forester. The landowner's signature date will be considered the plan's completion date.

4. TABLE OF CONTENTS
This table will provide a quick reference to the specific sections of the management plan.

5. LOCATION & ACCESSIBILITY
This includes the landowner's name, total property acreage, its county and reference to the closest town and major highways. Accessibility may include public road access to the property as well the condition of access in the forested areas of the property itself.

6. LANDOWNERS OBJECTIVES
The landowner's primary management objectives for the property, along with the other resource

concerns are identified in several paragraphs. These objectives should be identified on the Stewardship application and through personal conversations with the landowner. These may include, but are not limited to: Timber Management, Wildlife Management including T & E species, Recreation, Soil, Air, and Water Conservation, Aesthetics, Forest Stand improvement, Riparian Area Management, Agroforestry, Pollinator Habitat, Carbon Sequestration, and protection of cultural resources.

7. BOUNDARY AND WOODLAND DESCRIPTION

Describe the boundaries and how well they are marked and briefly describe the current woodland conditions. This should include such things as a general description of the timber conditions, wildlife habitat present, existing recreational facilities, previously installed practices, past harvest history, spongy moth occurence, etc.

8. SUMMARY GUIDELINES FOR ADDRESSING RESOURCE ELEMENTS & ISSUES IN FOREST STEWARDSHIP PLANS

A forest stewardship plan should be written to address the landowner's objectives while adhering to National and State Forest Stewardship Management Plan guidelines. It is also important to integrate those resource elements identified under the management template developed by the American Tree Farm System, NRCS and the United States Forest Service. Instructions for the plan writer are in bold. How resource elements are addressed in the plan depend on the landowner's objectives and the "helping verbs" must & should. "Must" is required and "should" is discretional depending on how applicable the element is to the tract.

"MUST"

ARCHEOLOGICAL, CULTURAL, & HISTORIC SITES

All forest stewardship plans must include a description of the historical and cultural resources of the general area and the subject property. Historic resources are nonrenewable; they can never be replaced once destroyed. Good stewardship implies valuing the evidence of past human occupation on the land. Federal land and State laws protect historic resources from disturbances, destruction, or removal. Landowners should be made aware of laws pertaining to historical and cultural resources in the State. Plan writers need to be aware of any such site as the Forest Stewardship Plans is being developed and should consult local authorities within the plan area if something of historic or cultural value is discovered.

Plan writers must include a statement regarding whether these resources exist on the property. If resources exist or in case they are discovered later, writers should refer the landowner to the appropriate authority for information and assistance and/or include relevant information in the plan. Consider the following elements for protecting heritage resources on private forest lands:

- Determine the locations of these resources, particularly cemeteries, prior to implementing the project.
- Plan natural resources management practices to avoid disturbing the ground on or near historical sites, if possible.
- Work with existing land contours rather than reshaping the landscape to reduce the chance of

disturbing these resources.

- Retain any objects or artifacts discovered during a project and record the location from which they came to preserve their value for research.
- Cease all work and immediately notify local law enforcement if human remains are accidently unearthed.
- Revegetate agricultural sites to reduce long-term degradation of historical resources by eliminating cultivation as a source of continued disturbance.
- Establish riparian buffer zones and filter strips (which will also protect water quality).
- Use conservation easements to protect sensitive environmental and cultural qualities.

For more information on this subject, contact the WV Division of Culture and History, Historic Preservation Office(http://www.wvculture.org/shpo/staff.html), department of archives archaeology or other agency responsible for distributing heritage/historical resource information and implementing laws.

CARBON CYCLE & CLIMATE RESILIENCE

Maintaining healthy, resilient forests over time will require a clear appraisal of the risks and opportunities presented by climate change, including consideration of how local site conditions and management history might influence a property's vulnerability to climate change impacts. Plan writers should help landowners consider climate change and develop management recommendations that will help adapt or prepare forests for expected changes.

For landowners interested in carbon sequestration, the plan preparer should consider, describe, and evaluate issues related to the carbon cycle on the tract/property and the importance of this issue to the ownership. The plan should make the landowner aware that healthy, sustainably managed forests can help to reduce atmospheric carbon and reduce the effects of climate change. The plan should make the landowner aware of potential opportunities for carbon trading and participation in ecosystem service markets, where applicable.

Where landowner objectives dictate, plans should address opportunities to enhance carbon sequestration on the property by recommending silvicultural practices that enhance the forest's ability to sequester carbon.

Examples practices for climate resilience and carbon sequestration include but are not limited to:

- Afforestation/reforestation
- Keeping stands healthy (examples):
  Control invasive species
  - Diversify species
  - Manage deer
  - Monitor for insects and diseases
- Forest management in general
- Reducing wildfire carbon emissions through hazardous fuels reduction
- Extending rotations or the length of time between harvests
- Harvesting wood products (carbon storage varies depending on species and product type)
- Thinning to increase forest stand sequestration and storage

- Reducing carbon emissions through the substitution of wood products from other materials
- Avoiding deforestation (conservation easements or any means to assure the site will remain in forestland).

FORESTS OF RECOGNIZED IMPORTANCE

Unfortunately, there is no central clearinghouse for locations of or information on Forests of Recognized Importance (FORI), also known as High Conservation Value Forests. **Nonetheless, the plan writer must address FORI if the forest contains a combination of unique values, not just a single attribute, and is part of a larger landscape containing this combination of unique values OR when the landowner wants a Tree Farm Plan. In this case, Forest Stewardship Management Plans need to align with American Tree Farm Standards.** FORIs may include but are not limited to landscapes with exceptionally high concentrations of one or more of the following:

- globally, regionally or nationally significant concentrations of biodiversity values; and/or large landscape-level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance.
- protected, rare, sensitive or representative forest ecosystems such as riparian areas and wetland biotopes
- endemic species and critical habitats of multiple threatened or endangered plant and animal species, as identified under the Endangered Species Act (ESA) or other recognized listings
- recognized large‐scale cultural or archeological sites including sites of human habitation, cities, burial grounds and in situ artifacts
- identified and protected water resources upon which large metropolitan populations are dependent
- identified unique or geologic features including geysers, waterfalls, lava beds, caves, or craters
- basic services of nature in critical situations (e.g. watershed protection)
- fundamental to meeting basic needs of local communities (e.g. subsistence, health) and/or critical to local community's traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).
- conservation easements

FOREST HEALTH AND INVASIVE SPECIES

A healthy forest is a forest that possesses the ability to sustain the unique species composition and processes that exist within it. Active management of the forest helps to maintain and improve its productive capacity, considering all the factors that influence the resource elements addressed in the Forest Stewardship Plan. Silviculture can reduce risk from wildfire, pests, and invasive species, and ensure long-term forest health and vigor. Forest health protection issues are often directly related to the active management of insects and diseases, invasive plants, and wildfire. Yearly inspections for signs of insects, diseases, or invasive plant infestations should be completed by the landowner.

Non-native invasive species are one of the greatest threats to the forestlands of our state. **The plan preparer must identify invasive species in all forest stands, the extent of infestation (estimate area by percentage), and make site-specific recommendations using integrated pest management as well as approved eradication techniques. Provide the landowner the "Fighting Invasive Plants in West Virginia" brochure or informational brochures on identifying invasive insects and diseases.**

SOIL & WATER RESOURCES

Maintaining water quality and soil stability during forest management activities is regulated by federal and state laws. This may include the establishment of streamside management zones (SMZs) or forest riparian buffers, which are meant to prevent sedimentation and maintain healthy water temperatures for aquatic life. Proper pre-harvest planning prior to cutting timber can help ensure protection of both soil and water resources. **The plan preparer must identify streams, vernal pools, ponds, and other water bodies in all stands and maps that should be protected during all management activities. Direct the landowner to the West Virginia Division of Forestry's website for detailed information on protecting soil and water. The plan preparer must adhere to Appendix E, Components of a Forest Stewardship Plan which outlines requirements regarding soil mapping and interpretation.**

THREATENED & ENDANGERED SPECIES

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.

In West Virginia, listed species are generally associated with wetlands, shale barrens, or high elevation spruce-hemlock forests. However, West Virginia has many bat species some of which are listed that utilize much of our forestland and maintain forest health by consuming moths, beetles, and other destructive pests. Habitats required by bats have four basic components: food, water, cover, and space. Careful attention to snag retention of both dead and green trees particularly those with exfoliating bark, canopy gaps, and protection of water resources needs to be part of any harvesting activity.

Plan Writers must include a letter from WVDNR as to whether Rare, Threatened & Endangered species exist on the property. If they do exist, then writers should refer the landowner to the appropriate authority for information and assistance and/or include relevant information in the plan.

The West Virginia Wildlife Diversity Program (WDP) and Natural Heritage Program are responsible for those species listed by the federal government as threatened or endangered, as well as nongame wildlife and their habitats. It also administers many outreach programs and provides vital assessment information. 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 landowners make informed decisions as they implement their plans and manage their land. Contact or refer the landowner to the:

West Virginia Division of Natural Resources
Wildlife Diversity and Natural Heritage Program
Post Office Box 67
Elkins, WV
26241-0067
Phone: (304)
637-0245
Fax: (304) 637-0250 most efficient method is via email: Brian.P.Streets@wv.gov

WILDLIFE & FISH

For many forest landowners, wildlife management is one of their top (if not the top) objective for owning forest land. **Plans must address those objectives to the degree of interest expressed by the landowners. In general, all forest stands should include basic management techniques to provide for structure and food for all wildlife and aquatic life**. Landowners wishing to manage for specific species (e.g., deer, turkey, or fish) should receive more detailed guidance on habitat components and habitat recommendations. Landowners should be directed to the West Virginia Division of Natural Resources, Wildlife Resources Section for additional assistance. Landowners that have bodies of water present on their property should contact natural resource professionals to obtain technical assistance on improvement, aquatic maintenance, and fish habitat conservation.

WOOD & FIBER PRODUCTION

Growing and selling high quality timber is a major objective for many forest landowners. Plan writers **must** adhere to Appendix E, Components of a Forest Stewardship Plan and follow the listed requirements on collecting cruise information and developing stand management descriptions and recommendations. The Forest Stewardship Plan should identify and recommend sound silviculture practices designed to help establish a new forest stand (regeneration), manage the existing trees (intermediate stand management), or implement a harvest activity to reach desired future stand condition based on management objectives.

"SHOULD"

AESTHETIC QUALITY & DESIRED TIMBER SPECIES:

The plan preparer should consider, describe, and evaluate the aesthetic quality of the tract/property and its importance to the ownership. Where appropriate, and in compliance with landowner objectives and local regulations, recommendations should be provided in the plan to address the aesthetic quality of the property. For example, this could include recommendations to maintain the roadside aesthetic condition during timber harvesting, or recommendations to enhance view sheds around recreational resources. Where landowner objectives dictate, and as appropriate, plans could address maintaining and enhancing fall foliage, wildflowers, and scenic hiking trails.

Other considerations include:

- Measures that enhance natural aesthetics include converting agricultural fields to hardwoods or conifer forests.
- Favoring large-sized hardwood stems or unusual-formed stems within forest stands.
- Creating wooded buffer zones to protect riparian areas and enhance wildlife habitat.
- Planting or retaining tree species because of color, flower, or other characteristics.
- Retaining objects of special interest to the landowners such as vistas, bluffs, old home sites, flowering plants, unique stand of trees or other features.

AGROFORESTRY

Agroforestry intentionally combines agriculture and forestry to create integrated and sustainable land use systems. Agroforestry takes advantage of the interactive benefits from combining trees and shrubs with crops and/or livestock. In the United States, agroforestry is commonly divided into five main practices: Windbreaks, Alley Cropping, Silvopasture, Riparian Forest Buffers, and Forest Farming. Riparian forest buffers have been installed and managed in the Chesapeake Bay counties of the state, and forest farming, also known as multi-story cropping or non-timber forest products, is also a popular practice. Mushrooms, ginseng, maple syrup, and other products from the forest can provide additional income to landowners. If landowners express any interest in one of the agroforestry practices, direct them to the National Agroforestry Center (https://www.fs.usda.gov/nac/) or the nearest WVU Extension or NRCS office.

BIOLOGICAL DIVERSITY

Biodiversity is the variety of life (including diversity of species, genetic diversity, and diversity of ecosystems) and the processes that support it. Landowners can contribute to the conservation of biodiversity by providing diverse habitats. It is important to select management options that offer the greatest opportunities for promoting wildlife habitats and conserving biodiversity while fulfilling other land ownership objectives. **Based on landowner objectives plan writers should consider various options when developing the plan.** Some of these options include, but are not limited to, the conservation of wildlife habitats and biodiversity by:

- Managing stand-level habitat features, including different forest age classes and community types, relative to the need at the landscape-level.
- Promoting aquatic and riparian areas.
- Conserving rare species and communities.
- Protecting special features and sites.
- Developing partnerships with natural resource agencies and conservation organizations.

CONSERVATION-BASED ESTATE/LEGACY PLANNING or LAND TRANSFER

The average age of a family forest owner in West Virginia is 63 years old. The decisions that these aging landowners make about the future use and ownership of their land are the biggest driver of landscape change that we face. Ensuring that enough forests, in large enough property sizes continue in the future will not only help ensure working forests, but also the continuation of the many critical public benefits that these forests provide. In addition, many forest stewardship practices, particularly silvicultural recommendations, require multi-year or even multi-decade timeframes to reach their goal. It is, therefore, critical to pair silvicultural recommendations with estate planning.

Stewardship Plan writers are a trusted source of information about land and can play a critical role in helping landowners make an informed decision about the future use and ownership of their land. Specifically, plan writers **should** help landowners by:

- Helping to collect information
- Discussing client goals for the land
- identifying succession issues and objectives
- assisting with maintaining and monitoring of plan
- sharing educational materials (see links below)

- including language in the FSP management plan about the current ownership of the land and the implications for passing land through that type of ownership
- sharing names of competent estate planning professionals
- proving opportunity for peers to share their experience

Links:

- "What will become of your timberland" publication – USFS: http://www.srs.fs.fed.us/pubs/31987
- "Legacy Planning for Forest Landowners" (Virginia): http://www.ext.vt.edu/topics/environment-resources/legacy-planning/index.html
- "Ties to the Land" resources (Oregon): http://tiestotheland.org/
- "Your Land, Your Legacy" publication (Massachusetts): https://masswoods.org/legacy
- http://www.heirsproperty.org/
- http://www.fs.fed.us/spf/coop/programs/loa/flp.shtml
- Explains taxation on timber, tax laws by state, estate planning, et al. www.Timbertax.org

FIRE MANAGEMENT

The plan preparer should identify fire hazards in the forest stands and homestead and make site-specific recommendations. Direct the landowner to the West Virginia Firewise site https://wvforestry.com/firewise-wv/) **and provide the "Reduce the Risk" brochure.** Other considerations and recommendations include:

- Removing dead leaves, pine needles, tree branches and combustible debris from around homesteads.
- Storing firewood away from porches or decks.
- Storing machinery, such as four-wheelers, lawn mowers, and weed eaters, and fuel away from decks or porches.
- Planting less-flammable trees and shrubs around the home, including flowering dogwood, Eastern redbud, azaleas, and hydrangeas.
- Recommending a water supply within the property area, such as ponds and dry hydrants.
- Recommending fire breaks within the property.
- Describing how to control vegetation around the homestead.

RECREATION

Many private landowners own property for its recreation value. **Plan writers should enhance recreation potential by identifying recreational resources, describing opportunities, and providing guidance to maintain those attributes that meet the landowner's objectives.** Reclaimed skid trails for hiking or establishing game foot plots on landings for hunting are two such examples. Opportunities for birding, camping, and fishing may also be considered.

WETLANDS

Wetlands include areas where water covers the soil or is present either at or near the surface of the soil all year or for varying periods of time during the year (including during the growing season). Wetlands

generally include swamps, marshes, bogs, and fens. Wetlands are also highly diverse and productive ecosystems with emphasis on supporting water quality protection, wildlife habitat, timber production, and more. The landowner is responsible for understanding laws and regulations related to forestry practices before engaging in wetland management activities on their land. The WV Division of Forestry, the WV Department of Environmental Protection, and NRCS local offices can also provide information on forestry practices permitted in wetlands. **The plan preparer <u>should</u> identify wetlands in all stands and maps. Direct the landowner to the Corps of Engineers brochure on recognizing wetlands: http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/rw_bro.pdf**

9. TOPOGRAPHY AND SOILS DESCRIPTION

Provide a brief description of the predominate soil types, slopes and aspects on the property. Include soil descriptions and interpretations regarding potential forest productivity. Identify any interpretations regarding potential equipment limitations and/or erosion problems that may limit management opportunities. Refer to soils map if necessary.

10. EXPLANATION OF SITE INDEX, SIZE CLASS AND FOREST TYPES

Provide a brief description of site index and forest types and how this information will be used in the plan.

11. METHOD OF RECONNAISSANCE AND CRUISE DATA COLLECTION

Use the attached cruise intensity handout to determine the minimum number of points (BAF 10) to be taken in each stand and record the number of points in the plan. Plots may be located randomly or on a grid pattern. <u>Sawtimber volumes must be calculated using "International 1/4" Tree Scale</u>. This tree scale is the standard used by the WV State Division of Forestry. The plans will provide basic cruise data. However, the cruise will not be intensive enough to sell forest products or to conduct an appraisal.

12. SOILS MAP – in color

Provide a soils map with the property boundaries and soil types identified. The soils map shall include the following:

a. North arrow
b. Landowner's name
c. Plan acreage
d. County location
e. Date prepared
f. Plan preparer's name
g. Property boundary
h. Map legend

NOTE: This is all easily done on web soil survey

13. BOUNDARY CONDITION MAP – MUST BE A TOPO MAP

Provide a map with the property lines identified, indicating how the boundaries are marked. This map may be combined with the forest type map. The boundary map shall include the following:

a. North arrow
b. Landowner's name
c. Plan acreage
d. County location
e. Date prepared
f. Plan preparer's name
f. Property boundary
g. Map scale
h. Map legend

14. FOREST TYPE MAP – MUST BE A TOPO MAP

Provide a map identifying the different management stands within the property. This map may be combined with the boundary condition map. The forest type map shall include the following:

a. North arrow
b. Landowner's name
c. Plan Acreage
d. County location
e. Date prepared
f. Plan preparer's name
g. Property boundary
h. Map scale
i. Map legend
j. Forest type delineations

15. TOPOGRAPHIC STAND MAP

The stand map must be a topographic map. The topographic stand map shall include the following:

a. North arrow
b. Landowner's name
c. Plan acreage
d. County location
e. Date prepared
f. Plan preparer's name
g. Property boundaries
h. Access roads
i. Roads or trails within the property
j. Cultural resources
k. Bodies of water within or adjacent to property
l. Map scale (no less than 1": 1000', if possible)
m. Clearly defined stand boundaries
n. UTMs or latitude and longitude coordinates

16. GENERAL INVENTORY INFORMATION (TABLE 1) (*see sample in back of appendix*)

This information will be in table format and include the landowner's name, date, and the following column headers.

a. Stand number
b. Acres*
c. Total Bd. Ft. Volume (Int. ¼)*
d. Total Pulpwood Volume (tons)*
e. Average Stand Diameter Inches
f. Basal Area Sq. Ft.
g. Stocking Trees

* *These columns will be totaled for the entire property.*

17. STAND MANAGEMENT SUMMARY (TABLE 2) (*see sample in back of appendix*)

This information will be in table format and will include landowner's name, date and the following column headers.

a. Stand number
b. Acres
c. Site index
d. Cover type / Size class
e. Stand description
f. Spongy moth hazard rating
g. Recommended management activity

18. 10-YEAR PROPOSED ACTIVITY SCHEDULE (TABLE 3) (*sample in back of appendix*)

This information will be in table format and will include the landowner's name, date and the following column headers.

a. Stand number
c. Year

b. Acres
d. Activity

19. STAND MANAGEMENT DESCRIPTIONS AND RECOMMENDATIONS

Stand management recommendations should integrate the various resource activities to be performed over the next ten-years. These activities should be designed to correspond with the landowner's objectives. They should describe in site specific detail ***what, where, when, why, and how*** to perform practices, supplemented with appendix material where appropriate.

The following information should be included in each stand description, if applicable.

a. Acreage
b. Forest type
c. Site index
d. Size class
e. Age
f. Stocking level
g. Soil & water quality considerations
h. Evidence of fire or pest damage
i. Presence of invasive plant species
j. Evidence of fire or pest damage
k. T&E species, critical habitats, cultural resources, streams and water bodies
m. Recommended treatment(s)
n. Management history (If known)

20. APPENDICES

Each Forest Stewardship plan should include the following appendices; however Consulting Foresters do not need to include the appendices in the final plan copy provided to the Division of Forestry, Service Forester.

G. Glossary of Terms

H. Management Information Fire Management
Firewise West Virginia
Forest Health
General Forest Management Recommendations
Invasive Species & Integrated Pest Management
Controlling Invasive Plant Species
Invasive pests that threaten & kill trees
Soil & Water Resources
Harvesting Near Streams, Wetlands or Riparian Zones
Erosion Control and Seeding Guidelines for Logging Operations
Archeological, Cultural, and Historic Sites
Historic and Cultural Resources
Threatened & Endangered Species
Threatened & Endangered Species Recognition
Unique Ecosystems/Plant Committees
Wildlife
Wood & Fiber Production

General Timber Harvesting Recommendations
Timber Sale Checklist

Conservation Estate Planning

Supplemental Materials Available by Landowner Request

I. *Additional Cost Sharing Programs*
J. *Cost Share Assistance Information & Agency Contacts*
K. *Tax Tips for Forest Landowners*

Other materials which describe common management practices should be included in all plans where they apply, for example, lists of common wildlife plantings with their suitable soil types and the season of year to plant them.

21. CRUISE DATA SUMMARIES

This is a copy of the actual field data summaries from the cruise.

ACTIVITY RECORD

LANDOWNER:______________________________COUNTY:_____________________________

Date:	Type of Activity	Acres Involved	Species	Volumes Tons/Bd Ft	Income	Cost

CRUISE INTENSITY GUIDE

Minimum Number of Plots per Stand
(Prism or fixed area plots)

Using roughly cv of 70% at 15% error one standard deviation or 68 % confidence level.

Small acreage

10-19 acres	5 plots
20-29 acres	6 plots
30-39 acres	7 plots
40-49 acres	8 plots
50-59 acres	9 plots
60-79 acres	12 plots
80-100 acres	15 plots
101-150 acres	18 plots
Over 150 acres	22-25 plots

Using formula:

$$n = \frac{(1)^2 (cv70\%)^2}{(15\%)^2}$$

of

$$plots = \left(\frac{1std}{2}\right)^2 x \left(\frac{cv}{E}\right)^2$$

Plots needed at 68% Confidence Interval

	COEFFICIENT of VARIATION %								
E%	120	110	100	90	80	70	60	50	40
5	576	484	400	324	256	196	144	100	64
10	144	121	100	81	64	49	36	25	18
15	64	54	45	36	29	22	16	11	7
20	36	31	25	21	18	13	9	8	4

SAMPLE

GENERAL INVENTORY INFORMATION (TABLE 1)

*Not to be used to sell forest products *

LANDOWNER:_____ DATE:_____

TOTALS

STAND NUMBER	ACRES	TOTAL BD. FT. VOLUME	TOTAL PULPWOOD VOLUME (tons)	AVE. STAND DIAMETER INCHES	BASAL AREA SQ. FT	STOCKING TREES

*All Board Foot volumes based on International ¼ inch rule for tree measurement
** More detailed cruise data is necessary for planning harvests

SAMPLE

STAND MANAGEMENT SUMMARY TABLE (TABLE 2)

LANDOWNER:_____ DATE:_____

STAND	ACRES	SITE INDEX	COVER TYPE/ SIZE CLASS	DESCRIPTION	S.M. HAZARD RATING	MANAGEMENT ACITIVITY

SPECIES CODES:

BB- black birch
BE-beech
BG-black
BL-black locust
CO-chestnut oak
HIC-hickory
HM-hard maple
gum RO-red oak WA-white ash
SASS-sassafras
YP-yellow poplar
SM-soft maple
SO-scarlet oak
SW-sourwood

SAMPLE

10-YEAR PROPOSED ACTIVITY SCHEDULE (TABLE 3)

LANDOWNER:_____ DATE:_____

STAND #	ACRES	YEAR	ACTIVITY

STEWARDSHIP PLAN CHECKLIST

LANDOWNER NAME:
PREPARED BY:

PLAN ELEMENTS	YES	NO	EXPLAIN
1. Cover Page			
2. Introduction Letter			
3. Statement of Landowner Intent			
4. Table of Contents			
5. Landowner's Objectives			
6. Location & Accessibility			
7. Boundary and Woodland Description			
8. Summary of Forest Management Needs and Opportunities			
A. Aesthetic Quality (optional)			
B. Agroforestry (optional)			
C. Archeological, Cultural & Historic Sites (required)			
D. Biological Diversity (optional)			
E. Carbon Cycle & Climate Resistance (required)			
F. Fire Management (optional)			
G. Forests of Recognized Importance (FORI) (required)			
H. Forest Health & Invasive Species (required)			
I. Recreation (optional)			
J. Soil & Water Resources (required)			
K. Threatened & Endangered Species (required) DNR letter attached			
L. Wildlife & Fish (required)			
M. Wood & Fiber Production (required)			

PLAN ELEMENTS	YES	NO	EXPLAIN
9. Explanation of Site Index, Size Class & Forest Types			
10. Topography and Soils Description			
11. Method of Reconnaissance and Cruise Data Collection			
12. General Inventory Information (Table 1)			
13. Stand Management Descriptions and Recommendations			
14. Stand Management Summary (Table 2)			
15. 10-Year Proposed Activity Schedule (Table 3)			
16. * Soils Map			
17. * Boundary Condition Map			
18. * Forest Type Map			
19. Topographic Stand Map (1"=1,000' if possible) (Include Lat. and Long.)			
20. Copies of Cruise Data Summaries			
APPENDICIES ***(Standard in landowner's plan but optional in State's copy)***			
1. Glossary of Terms			
2. Activity Record Form			
3. Invasive pests that threaten & kill trees			
4. Invasive Plant Species Information			
5. Threatened and Endangered Species Information			
6. General Forest Management Recommendations			
7. General Timber Harvesting Recommendations			
8. Timber Sale Checklist			
9. Preparing to Sell Forest Products			
10. Best Management Practices (BMP) for Wetland or Riparian Zones			
11. Log Road Seeding Alternatives Information			
12. Financial Assistance Information and Agency Contacts			
13. Tax Tips for Forest Landowners (USDA Forest Service publication)			

14. Listing of References			

*See listing of necessary elements on previous pages in this document

All items checked Yes, indicates the plan is approved. Any items checked No, indicates the item is missing and must be added to the plan prior to approval. An item checked Explain must be explained below by item reference. The explanation should be detailed and specifically address the action necessary to approve the item.

Explain:

Approved by:_____ **Date:**_____

APPENDIX F
Sample plan and checklist

FOREST STEWARDSHIP

A FOREST RESOURCES MANAGEMENT PLAN FOR THE PROPERTY OF:

Mr. and Mrs. John Q. Landowner
Located in Any County, WV
Rt.1 Box 1
Any Town, WV 12345
304-111-1111

Prepared by:
Any Forester
1900 Kanawha Blvd., East
Charleston, WV 25305
304-558-2788
RF #___

____ Total Acres Planned
Prepared on 8/20/18
Plan Expires on 8/20/28

INTRODUCTION LETTER

SAMPLE

Dear Stewardship Landowner:

You may be wondering, "what is forest management"? Forest management is the art, science, and business of managing a forest for its most productive and beneficial use based on the landowner's goals and objectives. To you, a private property owner, this means a professionally prepared plan to use as a guide in making every acre of your land as productive as possible. It will take time and some investment on your part to achieve your goals and objectives. Forest management operations are long term and the amount of time from stand initiation to maturity may span two to three generations, or even more.

This plan is valid for the next ten years; however, market changes, new developments in forest management or any unusual circumstances such as forest fires, insects and/or disease attacks may warrant a revision. Other economic or even personal factors could develop that might alter or change your primary goals. However, one of the virtues of professional forest management is its flexibility and a call to your local Service Forester will result in professional advice about changing circumstances.

In any endeavor, it is good business to invest your dollars where they will yield the maximum return. A suggested work schedule that considers wildlife, timber, recreation, water quality, and other considerations is included in your plan.

Congratulations on developing a management plan for your timberland! A managed forest produces a greater yield of timber and profit than does an unmanaged forest. And it simultaneously provides better fringe benefits, such as diverse wildlife, aesthetic appeal, and increased recreational opportunities.

In my opinion, your desire to professionally manage your timber land will not only lead to a better and more productive forest for you and your family, but it will help insures the future economy of the State of West Virginia.

The information and recommendations specific to your property are in the first part of the document, followed by general information applicable to most or all forests.

Sincerely yours,

West Virginia
Forest Stewardship Program

STATEMENT
OF
LANDOWNER INTENT

I intend to follow the recommendations and findings of the forester, based on his/her reconnaissance and inventory. If I decide to have a commercial timber harvest, I will seek the advice of a professional forester and I agree that any timber harvesting will be completed according to this plan, to assure proper forest management. I understand that the inventory represented in this plan is not intensive enough to be used for the sale of any forest products.

I also reserve the right to have this plan amended according to future needs, which may change my situation, and I understand that the Division of Forestry, Service Forester, must concur with changes which involve cost-share practices.

_____ _____

Date Landowners' Signature

_____ _____

Date Consultant or DOF Service Forester's Signature

_____ _____

Date DOF Service Forester's or Regional Forester's Signature

Contents

PROPERTY INFORMATION

LOCATION AND ACCESSIBILITY

This includes the landowner's name, total property acreage, its county and reference to the closest town and major highways. Accessibility may include public road access to the property as well the condition of access in the forested areas of the property itself.

LANDOWNER'S OBJECTIVES

The landowner's management objectives for the property are to be listed in bullet point form or numbered in order of importance.

BOUNDARY AND WOODLAND DESCRIPTION

Describe the boundaries and how well they are marked and briefly describe the current woodland conditions. This should include such things as a general description of the timber conditions, wildlife habitat present, existing recreational facilities, previously installed practices, past harvest history, gypsy moth info, etc.

SUMMARY OF FOREST MANAGEMENT NEEDS AND OPPORTUNITIES

ARCHEOLOGICAL, CULTURAL AND HISTORIC SITES

Plan writers must include a statement as to whether or not these resources exist on the property. If they do, then writers should refer the landowner to the appropriate authority for information and assistance and/or include relevant information in the plan

Example: There are no known archeological, cultural or historic sites on this property. However, should any sites be located, please contact the WV Division of Culture and History at the address below.

WV Division of Culture and History
The Culture Center
Capitol Complex
1900 Kanawha Boulevard East
Charleston, WV 25305-0300
http://www.wvculture.org/

INVASIVE SPECIES AND INTEGRATED PEST MANAGEMENT

The plan preparer must identify invasive species in all forest stands, the extent of infestation (estimate area by percentage) and make site-specific recommendations using integrated pest management as well as approved eradication techniques

Example: Japanese stiltgrass was observed in each stand but was limited to the roads. This accounts for approximately 5% of the area of all stands. In many instances, the use of hand pulling, digging, mowing and other mechanical measures can be an effective control of initial populations of Japanese stiltgrass. There were no serious insect or disease problems detected on this tract during the reconnaissance and forest inventory. Some fifteen acres of predominately chestnut oak sites received severe gypsy moth defoliation and near one hundred percent oak mortality around 2002. A subsequent salvage cutting was completed during 2005.

SOIL AND WATER RESOURCES

The plan preparer must identify streams and other water bodies in all stands and maps. Direct the landowner to the West Virginia Division of Forestry's website for detailed information on protecting soil and water. The plan preparer must adhere to the Stewardship Operating Plan, Components of a Forest Stewardship Plan which outlines requirements regarding soil mapping and interpretation.

PLANS FOR PROPERTY LOCATED IN THE POTOMAC WATERSHED, RECEIVING FUNDING FROM THE CHESAPEAKE BAY PROGRAM THE FOLLOWING NEEDS TO BE INCLUDED:

Make sure BMPs for Streamside Management Zone (SMZ) are strictly followed and ***maintain a >50% canopy cover for the first 35'*** *measured as horizontal distance perpendicular to the water beginning at the top of the bank, or wetland edge. A light selection harvest can occur above the 35' horizontal distance up to 100' slope distance. Strict adherence to the WV Silvicultural BMPs so the Streamside Management Zone will be protected to prevent exposure of mineral soil and subsequent erosion. Equipment operation in this area should be limited to points where the stream must be crossed. Pulling cut trees from this area is permitted by cable. When mineral soil is exposed it shall be stabilized immediately by seeding and mulching, as well as any other additional measures that may be necessary to prevent sediment from entering the stream.*

Example: The topographic stand maps depicts the streams on the property. Please refer to wvforestry.com https://wvforestry.com/pdf/DOFbmpManual2018.pdf for detailed information on protecting soil and water quality.

THREATENED AND ENDANGERED SPECIES

Plan Writers must include a statement as to whether or not Threatened & Endangered species exist on the property. If they do, then writers should refer the landowner to the appropriate authority for information and assistance and/or include relevant information in the plan. Must also place a copy of the WVDNR's response letter in the appendix of the plan.

Check with your state wildlife agency and USFWS Threatened and Endangered Species 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 Division of Natural
Resources Wildlife Diversity and Natural
Heritage Program Post Office Box 67
Elkins, WV 26241-0067
Phone: (304)637-0245
Fax: (304)637-0245

The most efficient way for the forester to make this determination for the landowner is to email a digital map of the property in question to: brian.p.streets@w.gov

The USFWS consider the areas within 5 miles of an Indiana bat capture point, 2.5 miles of an Indiana bat roost, or 5 miles from any Indiana bat cave (and 10 miles

from Hellhole cave) to be known use areas for the species. They use a 6 mile buffer for Virginia big-eared bat hibernacula and roosts. The USFWS has not yet provided any final guidance on the northern long-eared bat use areas following the uplisting of the species to endangered, but the 4(d) rule for the species which still is in effect for the next year specifies the known use areas as 150 feet from roosts and 1/4 mile from hibernacula.

In terms of application, the conclusion would be that any property within a buffer as described above would be "within a known use area" whereas a known occurrence point would be considered "a known occurrence."

The USFWS has on its website a listing of species that are listed as T&E Species. Click on the link to find a specific species to find a list of fact sheets about the animal/plant in question. If any T&E species are shown to be on or in close proximity to the property include the fact sheets in the appendix and advise the landowner they need to contact USFWS service if any forest management activities are to take place on the property.

WILDLIFE

Plans must address those objectives to the degree of interest expressed by the landowners. In general all forest stands should include basic management techniques to provide for structure and food for all wildlife.

Example: The woodland on this tract consists of a variety of tree size classes and timber species, which provides for the diversity needed by both game and non-game wildlife. There are numerous spring seeps on the tract and several good quality den trees. A conifer plantation and old field site with prominent forest edge are present and there are several small woodland openings such as access roads and gas pipeline rights-of-ways. There is also an abundance of hard mast species such as oaks, hickories, and beech. These are all important attributes that contribute to diverse wildlife populations.

The recommended timber cutting and wildlife enhancement practices will help to regulate, on a continuing basis, the kind and amount of food and cover needed by wildlife during all seasons of the year. Implementation of these recommended timber and wildlife management practices will maintain or enhance habitat for

woodland game species such as deer, wild turkey, black bear, squirrel, raccoon and ruffed grouse as well as numerous non-game wildlife species.

Additional wildlife management recommendations, as well as a listing of food plot mixtures, are included in the appendix of this plan.

WOOD AND FIBER PRODUCTION

Growing and selling high quality timber is a major objective for many forest landowners. Plan writers must adhere to Appendix E, Components of a Forest Stewardship Plan and follow the listed requirements on collecting cruise information and developing stand management descriptions and recommendations.

Example: The timber cruise completed on the tract indicates the following current sawtimber and pulpwood volumes:

TOTAL BOARD FOOT VOLUME—1,321,447 (International ¼ Inch)
CORDWOOD VOLUME—2,655.8 TON (1,002.19 CORDS)

The Stand Descriptions and Management Recommendations in this Forest Stewardship Plan contain recommendations for growing and selling high quality timber.

FOREST OF RECOGNIZED IMPORTANCE (FORI)

Where present and relevant to the property the plan writer must address forests of recognized importance (FORI). Specifically, high conservation value forests are those that possess one or more of the following attributes:

a. ***Forest areas containing globally, regionally or nationally significant: concentrations of biodiversity values; and/or large landscape-level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance***
b. ***Forest areas that are in or contain rare, threatened or endangered ecosystems***
c. ***Forest areas that provide basic services of nature in critical situations (e.g. watershed protection)***
d. ***Forest areas fundamental to meeting basic needs of local communities (e.g. subsistence, health) and/or critical to local communities traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).***

Examples: Red spruce forest, bogs, wetlands, caves (check with the WVDNR Natural Heritage Program). FORI does not have to cover the entire property. The property can contain a portion of the FORI on the larger landscape.

CONSERVATION-BASED ESTATE/LEGACY PLANNING INFORMATION (OPTIONAL)

The average age of a family forest owner in the United States is 62 years old. The decisions that these aging landowners make about the future use and ownership of their land are the biggest driver of landscape change that we face. Ensuring that enough forests, in large enough property sizes continue in the future will not only help ensure working forests, but also the continuation of the many critical public benefits that these forests provide. In addition, many forest stewardship practices, particularly silvicultural recommendations, require multi-year or even multi-decade timeframes to reach their goal. It is, therefore, critical to pair silvicultural recommendations with estate planning.

Foresters are a trusted source of information about land and can play a critical role in helping landowners make an informed decision about the future use and ownership of their land. Specifically, foresters can help landowners by providing:

- ***Educational materials (see links in appendix);***

- ***Language in the FSP management plan about the current ownership of the land and the implications for passing land through that type of ownership;***
- ***Names of competent estate planning professionals: and***
- ***Opportunity for peers to share their experience***

AESTHETIC QUALITY (OPTIONAL)

The plan preparer should consider, describe and evaluate the aesthetic quality of the tract/property and its importance to the ownership. Where appropriate, and in compliance with landowner objectives and local regulations, recommendations should be provided in the plan to address the aesthetic quality of the property.

CARBON CYCLE (OPTIONAL)

For landowners interested in carbon sequestration, the plan preparer should consider, describe and evaluate issues related to the carbon cycle on the tract/property and the importance of this issue to the ownership. The plan should make the landowner aware that healthy, sustainably managed forests can help to reduce atmospheric carbon and reduce the effects of climate change.

FIRE MANAGEMENT (OPTIONAL)

The plan preparer <u>should</u> identify fire hazards in the forest stands and homestead, and make site-specific recommendations. Direct the landowner to the West Virginia Firewise site and provide the "Reduce the Risk" brochure.

<u>RECREATION (OPTIONAL)</u>

Plan writers <u>should</u> enhance recreation potential by identifying recreational resources, describing opportunities and provide guidance to maintain those attributes that meet the landowner's objectives.

TOPOGRAPHY AND SOILS

Provide a brief description of the predominate soil types, slopes and aspects on the property. Include soil descriptions and interpretations regarding potential forest productivity. Identify any interpretations regarding potential equipment limitations and/or erosion problems that may limit management opportunities. Refer to soils map if necessary.

SITE INDEX AND FOREST TYPES

Provide a brief description of site index and forest types and how this information will be used in the plan.

METHOD OF RECONNAISANCE AND CRUISE INFORMATION

The minimum number of points (BAF 10) to be taken in each stand is to be determined with the attached cruise intensity handout. The number of points taken must be included. Plots may be located randomly or on a grid pattern. Sawtimber volumes must be calculated using "International 1/4" Tree Scale. This tree scale is generally accepted as the standard by the WV State Division of Forestry. The plans will provide good basic cruise data. However, the cruise will not be intensive enough to sell forest products or to conduct an appraisal.

SOILS MAP

Provide a soils map with the property boundaries and soil types identified. The soils map shall include the following:

a. North arrow
b. Landowner's name
c. Plan acreage
e. Date prepared
f. Plan preparer's name
g. Property boundary

d. County location ***h. Map legend***

BOUNDARY CONDITION MAP

Provide a map with the property lines identified, indicating how the boundaries are marked. This map may be combined with the forest type map. The boundary map shall include the following:

a. North arrow
b. Landowner's name
c. Plan acreage
d. County location
e. Date prepared
e. Plan preparer's name
f. Property boundary
g. Map scale
h. Map legend

FOREST TYPE MAP

Provide a map identifying the different management stands within the property. This map may be combined with the boundary condition map. The forest type map shall include the following:

a. North arrow
b. Landowner's name
c. Plan Acreage
d. County location
e. Date prepared
f. Plan preparer's name
g. Property boundary
h. Map scale
i. Map legend
j. Forest type delineations

TOPOGRAPHIC STAND MAP

The stand map shall be computer generated. The topographic stand map shall include the following:

a. North arrow
b. Landowner's name
c. Plan acreage
d. Plan preparer's name
e. Property boundaries
f. Access roads
g. Roads or trails within the property
h. Cultural resources
i. Bodies of water within or adjacent to property
j. Map scale (no less than 1" = 1000', if possible)
k. Clearly defined stand boundaries
l. UTMs or latitude and longitude coordinates
m. Areas for management activities

GENERAL INVENTORY INFORMATION *

(NOT TO BE USED FOR THE SALE OF FOREST PRODUCTS)

TABLE I

Stand Number	Acres	Total Bd. Ft. Volume**	Total Cordwood Volume (Tons)	Avg. Stand Diameter (in.)	Basal Area Sq. Ft.	Stocking Trees/Acre
TOTALS:						

*

More detailed cruise data is necessary for planning harvests

** *Total board foot volumes are based on the International ¼ Inch Rule for tree measurement*

STAND MANAGEMENT SUMMARY TABLE

TABLE II

STAND	ACRES	SITE CLASS	COVER TYPE SIZE CLASS	DESCRIPTION	SPONGY MOTH HAZARD RATING	MANAGEMENT ACTIVITY

SPECIES CODES:

WA – White Ash BAS – Basswood BC – Black Cherry BB – Black Birch BE – Beech BG – Black Gum
BL – Black Locust BO – Black Oak CO – Chestnut Oak ELM – Elm EH – Hemlock HI – Hickory
SM – Sugar Maple MSC – Miscellaneous WP—White Pine NRO – Red Oak SASS – Sassafras RM – Red Maple
SO – Scarlet Oak SYC – Sycamore WAL – Black Walnut WO – White Oak YP – Yellow Poplar YB—Yellow Birch
NS—Norway Spruce SP—Scotch Pine

10 YEAR PROPOSED ACTIVITY SCHEDULE

TABLE III

STAND	PRIORITY	TIME PERIOD	ACTIVITY

NOTE: *This is only a proposal of work that should be carried out and an approximate time-table based upon the needs of individual stands and expected returns on investments*

STAND MANAGEMENT DESCRIPTIONS AND RECOMMENDATIONS

Stand management recommendations should integrate the various resource activities which are to be performed over the next ten-years. These activities should be designed to correspond with the landowners objectives. They should describe in site specific detail what, where, when, why and how to perform practices, supplemented with appendix material where appropriate.

The following information should be included in each stand description, if applicable.

a. Acreage
b. Forest type
c. Site index
d. Size class
e. Age
f. Stocking level
g. Soil & water quality considerations
h. Evidence of fire or pest damage
i. Presence of invasive plant species
j. Evidence of fire or pest damage
k. T&E species, critical habitats, cultural resources, streams and water bodies
m. Recommended treatment(s)
n. Management history (If known)

STAND **ACRES**

Soils: _____
Site Index: ____ (Forest Type)

STAND DESCRIPTION

RECOMMENDED TREATMENTS

STAND MANAGEMENT DESCRIPTIONS AND RECOMMENDATIONS

Stand management recommendations should integrate the various resource activities which are to be performed over the next ten-years. These activities should be designed to correspond with the landowners objectives. They should describe in site specific detail what, where, when, why and how to perform practices, supplemented with appendix material where appropriate.

The following information should be included in each stand description, if applicable.

a. Acreage
b. Forest type
c. Site index
d. Size class
e. Age
f. Stocking level
g. Soil & water quality considerations
h. Evidence of fire or pest damage
i. Presence of invasive plant species
j. Evidence of fire or pest damage
k. T&E species, critical habitats, cultural resources, streams and water bodies
m. Recommended treatment(s)
n. Management history (If known)

STAND **ACRES**

Soils: _____
Site Index: ____ (Forest Type)

STAND DESCRIPTION

RECOMMENDED TREATMENTS

STEWARDSHIP PLAN CHECKLIST

LANDOWNER NAME:
PREPARED BY:

PLAN ELEMENTS	YES	NO	EXPLAIN
1. Cover Page			
2. Introduction Letter			
3. Statement of Landowner Intent			
4. Table of Contents			
5. Landowner's Objectives			
6. Location & Accessibility			
7. Boundary and Woodland Description			
8. Summary of Forest Management Needs and Opportunities			
A. Aesthetic Quality (optional)			
B. Agroforestry (optional)			
C. Archeological, Cultural & Historic Sites (required)			
D. Biological Diversity (optional)			
E. Carbon Cycle & Climate Resistance (required)			
F. Fire Management (optional)			
G. Forests of Recognized Importance (FORI) (required)			
H. Forest Health & Invasive Species (required)			
I. Recreation (optional)			
J. Soil & Water Resources (required)			
K. Threatened & Endangered Species (required) DNR letter attached			
L. Wildlife & Fish (required)			
M. Wood & Fiber Production (required)			

PLAN ELEMENTS	YES	NO	EXPLAIN
9. Explanation of Site Index, Size Class & Forest Types			
10. Topography and Soils Description			
11. Method of Reconnaissance and Cruise Data Collection			
12. General Inventory Information (Table 1)			
13. Stand Management Descriptions and Recommendations			
14. Stand Management Summary (Table 2)			
15. 10-Year Proposed Activity Schedule (Table 3)			
16. * Soils Map			
17. * Boundary Condition Map			
18. * Forest Type Map			
19. Topographic Stand Map (1"=1,000' if possible) (Include Lat. and Long.)			
20. Copies of Cruise Data Summaries			
APPENDICIES ***(Standard in landowner's plan but optional in State's copy)***			
1. Glossary of Terms			
2. Activity Record Form			
3. Invasive pests that threaten & kill trees			
4. Invasive Plant Species Information			
5. Threatened and Endangered Species Information			
6. General Forest Management Recommendations			
7. General Timber Harvesting Recommendations			
8. Timber Sale Checklist			
9. Preparing to Sell Forest Products			
10. Best Management Practices (BMP) for Wetland or Riparian Zones			
11. Log Road Seeding Alternatives Information			
12. Financial Assistance Information and Agency Contacts			

13. Tax Tips for Forest Landowners (USDA Forest Service publication)			
14. Listing of References			

*See listing of necessary elements on previous pages in this document

All items checked Yes, indicates the plan is approved. Any items checked No, indicates the item is missing and must be added to the plan prior to approval. An item checked Explain must be explained below by item reference. The explanation should be detailed and specifically address the action necessary to approve the item.

Explain:

Approved by:_____ **Date:**_____

APPENDIX G

GLOSSARY OF FORESTRY TERMS

ACRE - A unit of area used in land measurement equal to 160 square poles, 4,800 square yards or 43,569 square feet.

ADVANCE REGENERATION - Seedlings or saplings that are present in the understory prior to removal of any over story.

AGE CLASS - A group of trees in a stand that are at or nearly the same age.

ARTIFICIAL REGENERATION (reproduction) - Creation of a new age class by direct seeding, or by planting seedlings or cuttings.

AESTHETICS - The perception of beauty conveyed by a natural scene, a pleasant sight.

BASAL AREA - Total area of cross section of stems measured at breast height (4½ feet above the ground), usually expressed in square feet per acre.

BEST MANAGEMENT PRACTICES - Guidelines establishing standards for all aspects of logging which have been developed to reduce sedimentation of streams.

BIOLOG1CAL DIVERSITY - The distribution and abundance of different plant and animal communities.

CLEANING - A release treatment made in an age class not past the sapling stage in order to free the favored trees from less desirable individuals of the same age class which overtop them or are likely to do so.

CLEAR-CUT - An even-age method of regenerating a stand through the removal, in a single cut, of all trees larger than seedlings. The new age class develops in a fully-exposed microclimate. In some situations, small numbers of trees may be left within the clear-cut opening for some special purpose.

CLIMAX FOREST - The final stage of succession, that is relatively stable and self-perpetuating.

COMPETITION - the constant demand of each organism growing space, light, nutrients and water.

COMPOSITION, STAND - The proportion of each tree species in a stand expressed as a percentage of the total number, basal area or volume of all tree species in the stand.

CONDITIONING CUT - A harvest cut which is used to improve the overall health of the stand by removing mature, over mature, low vigor and poor quality trees. The result is a stand of better stocking, more vigorous and desirable species, increased diversity, quality and growth potential.

CONSERVATION - The wise-use of natural resources. The management of a resource which retains the basic character of that resource over time.

CROP TREE - Any tree that is selected to become a component of a future final harvest.

CROWN CLASS - A class of tree based on crown position relative to crowns of adjacent trees.

> **Dominant** - Trees with crowns extending above the general level of the main canopy of groups of trees, and receiving frill light from above and comparatively little from the sides. Co-dominant- Trees with crowns forming the general level of the main canopy in groups of trees, receiving frill light from above and comparatively little from the sides.
>
> **Intermediate** - Trees with crowns extending into the lower portion of the main canopy of groups of trees, but shorter in height than the co-dominants. They receive little direct light from above and none from the sides.
>
> **Overtopped (suppressed) -** Trees of varying levels of vigor that have their crowns completely covered by the crowns of one or more neighboring trees. These trees receive little if any direct light.

CROWN COVER - The ground area covered by the crowns of trees or woody vegetation as delineated by the vertical projection of crown perimeters and commonly expressed as percent of total ground area (syn. Canopy Cover).

CROWN DENSITY - The compactness, or depth of foliage of the crowns of trees and/or shrubs.

CULL TREES - Any tree in which 50% or more of the total volume is defective.

CUTTING CYCLE - The planned interval between partial harvests in an uneven-aged stand.

DEFERMENT CUT- A regeneration practice during which, up to 20% of the basal area of the stand is carefully selected for retention. These trees are meant to remain through the end of the succeeding rotation. This practice creates a two-aged stand.

DEN TREE - Any tree with one or more cavities that afford shelter or protection to wildlife.

DIAMETER AT BREAST HEIGHT (DBH) - A measuring point on a tree made at 4 feet above the ground on the uphill side.

DIAMETER CLASSES - A group of trees or logs of similar sizes at a common point. Usually in two-inch increments at DBH for trees and one inch increments, inside the bark on the small end for logs.

ECOSYSTEM - The natural complex of plant and animal populations and the particular sets of physical conditions under which they exist.

ENDANGERED SPECIES - Any life form which is in danger of extinction throughout all or a significant portion of its range. Its population level is so critically low and/or its habitat is so degraded that immediate action must be taken to avoid the loss of the species.

EVEN-AGED STAND - A stand of trees containing a single age class in which the range of tree ages is usually less than 20 percent of rotation.

FAUNA - of or related to the animals of a specified region or time, a descriptive list of such animals.

FLORA - Of or relating to plants, the plants of a particular region or time, a descriptive list of such plants.

FOREST HEALTH - Forest can be considered healthy when there is a balance between growth and mortality, and the forest has the resiliency to react and overcome various forest impacts. Potential forest stressors include insects, pathogens, weather, climate, pollution and others.

FOREST PRODUCTIVITY - The ability of tree species to grow on a particular site; influenced by internal (tree physiology) and external (soil, climate) factors.

FOREST RESOURCES - Natural resources associated with forested ecosystems, included but not limited to; fish, air, clean water, wildlife, vegetation, soil, recreation and aesthetics.

FULLY STOCKED STANDS - Any stand containing a combination of basal area and stems per acre sufficient to indicate optimum use of the available growing space.

GROUP SELECTION - A method of regenerating uneven-aged stands in which trees are removed, and new age classes are established, in small groups. The maximum width of the group is approximately twice the height of the mature trees, with these small openings providing micro environments suitable to regenerate shade intolerant tree species (requiring direct sunlight for growth). These areas are generally not more than one-quarter acre in size.

HABITAT - The specific combination of food, shelter, and water that is required to accommodate a species.

HARDWOOD STAND - Any forest stand in which the number of stems, basal area or volume consists of a majority of broad-leaf tree species.

IMPROVEMENT CUTTING - A cutting made in a stand past the sapling stage primarily to improve composition and quality by removing less desirable trees.

INTERMEDIATE STREAMS - Any water course which carries a visible flow of water periodically, usually depending on the season of the year, or the current and recent weather condition.

INTERMEDIATE TREATMENTS - A collective term for any treatment designed to enhance growth, quality, vigor and composition of the stand after establishment of regeneration and prior to final harvest.

INVENTORY (forest) - The gathering of information such as the forest condition, land area, tree volumes, growth and mortality to provide for effective management planting.

LANDSCAPE - An area composed of interacting ecosystems that are repeated because of geology, land form, soils, climate, iota and human influences throughout the area. Landscapes are generally of a size, shape and pan em which is determined by interacting ecosystems.

MATURE FOREST - Generally used in an economic sense to indicate that a forest has attained harvest age.

MULTIPLE-USE - The act of satisfying more than one need with a single resource.

NATURAL REGENERATION - A stand of created from natural seeding, sprouting, securing or layering.

OLD-GROWTH FOREST - Forests that contain a wide range of tree sizes and ages, a deep, multilayered crown canopy, diverse shrub and for layers, and significant accumulations of coarse woody debris including snags and fallen logs. Stands typically appear all-aged rather than even-aged. Large trees can be evidence that the old growth ecosystem has had sufficient time to develop diverse structure, although not all old growth stands have large trees, particularly on less productive sites. Large trees can exist in relatively young stands on very productive sites.

PARTIAL CUTTING - The removal of a specific segment or component of a stand in a single operation, followed by a series of operations which remove other components until a specific goal is attained.

PERENNIAL STREAMS - Any stream channel containing a visible volume of water throughout the year with the exception of drought periods.

PINE STAND - Any forest stand whose composition, based on number of stems, volume or basal area, consists of a majority of pine species (trees with needles in bundles).

PRECOMMERCIAL THINNING - A thinning that does not yield trees of commercial value, usually designed to improve crop tree spacing.

PRESCRIPTIONS - The written instructions by a forester for the preparation and administration of a resource management practice.

PRUNING - To cut off or remove dead or living tree branches to improve tree growth, quality and commercial value of the tree.

RARE (species) - Species of a given region that are found in unusual habitats where local edaphic, topographical or biotic factors provide conditions unfavorable for those species having a more widespread distribution. Examples of such areas in WV are rock cliffs, rocky water splashed river

banks, sphagnum bogs (or glades) and shale barrens.

REGULAR UNEVEN-AGED (balanced) STAND - A stand in which three or more distinct age classes occupy approximately equal areas and provide a balanced distribution of diameter classes.

RELEASE - A treatment designed to free young trees from undesirable, usually overtopping, competing vegetation. Treatments include cleaning, liberation and weeding.

RESIDUAL STAND - The aggregate of trees remaining in a stand following a silvicultural practice or natural disturbance.

RIPARIAN ZONE - The immediate area influenced by the presence of a concentration of water. The banks of streams, lakes or marshes.

ROTATION - The planned number of years between the regeneration of a forest stand and its final cutting.

SALVAGE CUTTING - The removal of dead trees or trees being damaged or killed by injurious agents other than competition, to recover value that would otherwise be lost.

SAPLING - A tree, usually young, that is larger than a seedling but smaller than a pole, generally between 1" and 5" in diameter.

SEDIMENTATION - The process of depositing a solid after being transported by a liquid. The act or process of depositing soil particles onto the stream bed.

SHADE INTOLERANT - A description assigned to any tree species whose seedlings are incapable of sustained development in low light.

SHADE TOLERANT - Plants that are more competitive in shaded environments through selection for low respiration rates, they also tend to have lower photosynthetic rates and hence grow slowly in all environments.

SHRUB - A woody plant of relatively low height, distinguished from a tree by having several stems rather than a single trunk.

SHELTERWOOD METHOD - A method of regenerating an even-aged stand in which a new age class develops beneath the partially-shaded micro-environment provided by the residual trees. In one or more succeeding harvests the residual stand is removed to fully release the established regeneration.

SILVICULTURE - The art and science of controlling the establishment, growth, composition, health and quality of forests and woodlands. Silviculture entails the manipulation of forest and woodland vegetation in stands and on landscapes to meet the diverse needs and values of landowners and society on a sustainable basis.

SILVICULTURE SYSTEM - A planned process whereby a stand is tended, harvested and reestablished. The system name is based on the number of age classes and/or the regeneration

method used.

SINGLE TREE SELECTION - A method of creating new age classes in uneven-aged stands in which individual trees of all size classes are removed more or less uniformly throughout the stand to achieve desired stand structural characteristics.

SITE CLASS - A classification of site quality, usually expressed in terms of ranges of dominant tree height at a given age or potential mean annual increment at culmination.

SITE QUALITY (Productivity) - The productive capacity of a site, usually expressed as volume production of a given species.

SITE PREPARATION - Reduction of competing vegetation, the removal of physical obstacles to planting and the drainage of water toward or away from the planted trees - to insure successful establishment of new trees.

SITES - Areas considered by ecological factors with reference to capacity to produce forests or other vegetation; the combination of biotic, climatic and soil conditions of an area.

SIZE CLASSES - Tree sizes recognized by distinct ranges, usually of diameter or height.

SNAG - A standing dead tree from which the leaves and most of the branches have fallen.

SPECIES DIVERSITY - The amount of variety of life forms associated with an area. Used as an indicator of the health of an ecosystem.

STAND - A contiguous group of trees sufficiently uniform in age class distribution, composition and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit.

Mixed Stand - A stand in which there is a mixture of species.

Pure Stand - A stand composed of essentially a single species.

Stratified Mixture - A stand in which different species occupy different strata of the total crown canopy.

STAND DENSITY - A quantitative, absolute measure of tree occupancy per unit of land area in such terms as numbers of trees, basal area, or volume.

STAND IMPROVEMENT - A term comprising all intermediate cuttings made to improve the composition, structure, condition, health and growth of even or uneven-aged stands.

STAND PRESCRIPTIONS - A written evaluation of a forest stand including directions and guidelines to be applied in order to change the condition of the stand to some desired condition as expressed in the management plan.

STEWARDSHIP - The integration of managing, growing, nurturing and harvesting of trees for useful products with the conservation of soil, air and water quality, wildlife and fish habitat and aesthetics. A management ethic advocating practices designed to improve a resource.

STOCKING - An indication of growing-space occupancy relative to a pre-established standard. Common indices of stocking are based on percent occupancy, basal area, relative density and crown competition factor.

SUCCESSION (ecological) - A process of community development that involves changes in species structure and community processes over time.

SUCCESSIONAL STAGE - One in a series of usually transitory communities or developmental stages that occur on a particular site or area over a period of time. Eventually, on most sites, a relatively stable, self-perpetuating stage, called a climax, is attained.

SUSTAINABLE - To produce a steady predictable quantity of all resources over time.

THREATENED SPECIES - One which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. This species may be rare but relatively stable in its population size, or it may be fairly common but declining rapidly.

THINNING - A cutting made to reduce stand density of trees primarily to improve growth, enhance forest heath or to recover potential mortality.

TIMBER COVER TYPES - A descriptive classification of forest land based on present occupancy of an area by commonly recognizable combinations of tree species.

TIMBER SIZE CLASS A descriptive classification grouping a broad range of tree sizes together based on the common utility of trees within that range.

TOLERANCE, SHADE - The relative capacity of a plant to become established and grow in the shade.

TREE - A usually tall, woody plant, distinguished from a shrub by having comparatively greater height and characteristically, a single trunk rather than several stems.

TREE SHELTERS - A translucent plastic tube supported by a stake, placed around tree seedlings. Shelters protect seedlings from deer and small mammal damage and extremes in environmental conditions, thereby boosting the seedlings chances of survival and usually enhancing the growth rate.

TWO-AGED STAND - A stand composed of two distinct age classes that are separated in age by more than 20 percent of rotation.

UNEVEN-AGED STAND - A stand of trees of three or more distinct age classes, either intimately mixed or in small groups, separated in age by more than 20% of the rotation.

UNDERSTOCKED - A stand with any combination of basal area and stems per acre insufficient to optimally utilize the available growing space by the trees present.

VEGETATIVE COVER - The composite of all plant life on a given site.

WATERSHED - The entire area contributing to the supply of a river or lake; a drainage area. The entire area of land upon which the excess water (runoff) enters a common stream.

WETLANDS - Lands transitional between terrestrial and aquatic systems the water table is usually at or near the surface or the land is covered with shallow and sometimes temporary waters, at least part of the year.

SUPPLEMENTARY MATERIALS

Supplementary Materials

Table of Contents

INVASIVE PESTS THAT THREATEN AND KILL TREES

The transportation of goods and services, plants and animals worldwide has introduced unwanted invasive species which have threatened particular plants, trees, and ecosystems in our forests of West Virginia. In many cases these invasives have devastating impacts on our native vegetation due to the lack of control through natural checks and balances such as parasites, diseases, insects, predators, etc. not present in our ecosystems.

In West Virginia, Forest Health Protection Specialists, foresters, landowners, and wildlife biologists strive to manage invasive species in an attempt to maintain a healthy forest ecosystem and reduce economic or environmental harm or harm to human health . The challenges to management depend on the objectives for a given piece of land as invasives can impact wood fiber, wildlife needs, recreation and aesthetics.

While there are many invasives in the state and some heading our way, forest managers should be particularly concerned and aware of Spongy moth, Beech Bark disease, Emerald Ash Borer, Hemlock Wooly Adelgid, Thousand Cankers Disease, and Asian Longhorned Beetle. Annual monitoring for these invasives with plans for management options should help the landowner control the impact brought on by these forest pests.

SPONGY MOTH INFORMATION

Minimizing Impacts in Your Woodlands

The spongy 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. Currently it is found statewide except for counties in the southwest portion of the state.

In the northeastern states, spongy moth populations peak every 8 to 11 years. They feed on more than hundreds of different tree and shrub species in forest and urban areas. Repeated heavy defoliation by spongy moths leads to the death of trees. Spruce, pine and hemlocks die after one year of heavy defoliation. Hardwood tree mortality after two successive years of defoliation, can reach as high as 80%.

RECOMMENDATIONS

There are five essential steps in minimizing spongy moth impacts:

1. IDENTIFY STANDS WHERE SEVERE IMPACTS ARE LIKELY

Spongy 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 spongy 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 spongy moth mortality in West Virginia, the Division of Forestry has developed guidelines (see below) for estimating the potential mortality that can be expected following one, two or three consecutive years of spongy 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 spongy moth parasites and predators, effectiveness of control measures and weather conditions. Each of these factors is in of themselves difficult to predict. Though not perfect, the guidelines do provide an indication as to where severe impacts are most likely to occur.

Guidelines for estimating potential mortality

% Oak	Potential Mortality	
50% +	HIGH	25%
21—49%	MODERATE	11-24%
11-20%	LOW	5- 10%
0-10%	VERY LOW	0-4%

Using these guidelines, your timber stands were assigned hazard ratings for potential mortality from spongy moth. *(See Stand Management Summary Table (Table 2))*

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

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

MANAGEMENT OBJECTIVE	**EGG MASSES/ACRE**
Timber	1,000
Aesthetics	700
Wildlife - Mast Production	500
Recreation - Nuisance Prevention	250

Inspect your woodland for egg masses sometime after the leaves drop in the fall each year. If they are found, count the number on a 1/40 acre plot. You only want to determine the number of new (current year) egg masses per acre. New egg masses are brightly colored and firm to the touch. Old

egg masses are faded and spongy. To do this, step off a rectangular plot 27 feet by 40 feet. Count the number of new egg masses on trees, stumps, down logs, etc. 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 spongy moth hazard ratings. Average the per acre egg mass counts and if you find 1,200 or more egg masses per acre 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, may also cause problems. It should be noted that the West Virginia Department of Agriculture will conduct egg mass surveys on your property upon request.

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.

Contact your consulting forester, the local DOF Service Forester or entomologists from 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 early to mid- May when the caterpillars are small.

The West Virginia Department of Agriculture (WVDA) coordinates and conducts a Cooperative State County Landowner (CSCL) spongy moth suppression program for the landowners of West Virginia in cooperation with the county commissions in the generally infested counties and with the USDA-Forest Service who has historically provided cost share dollars for the program. Aerial spraying is done on a demand basis to minimize forest damage. Sign-up for the Spongy Moth CSCL program is available June through August at your WVU County Extension Office or your local WVDA office in any of the participating counties.

4. USE SILVICULTURE TO MINIMIZE IMPACTS

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

Thinning and improvement cuttings 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 spongy moth defoliation and to resist attack by secondary organisms.

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

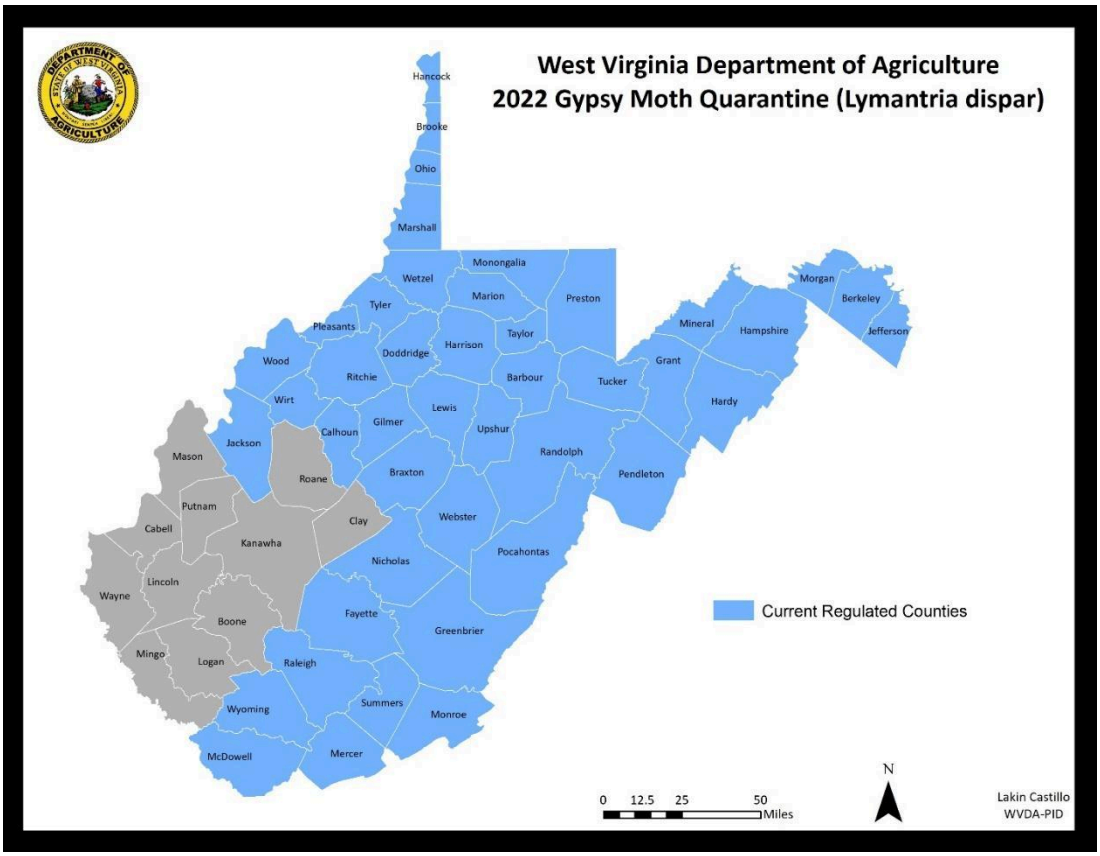
5. SALVAGE DEAD TREES WITHIN TWO YEARS

Despite your precautions, if the spongy 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.

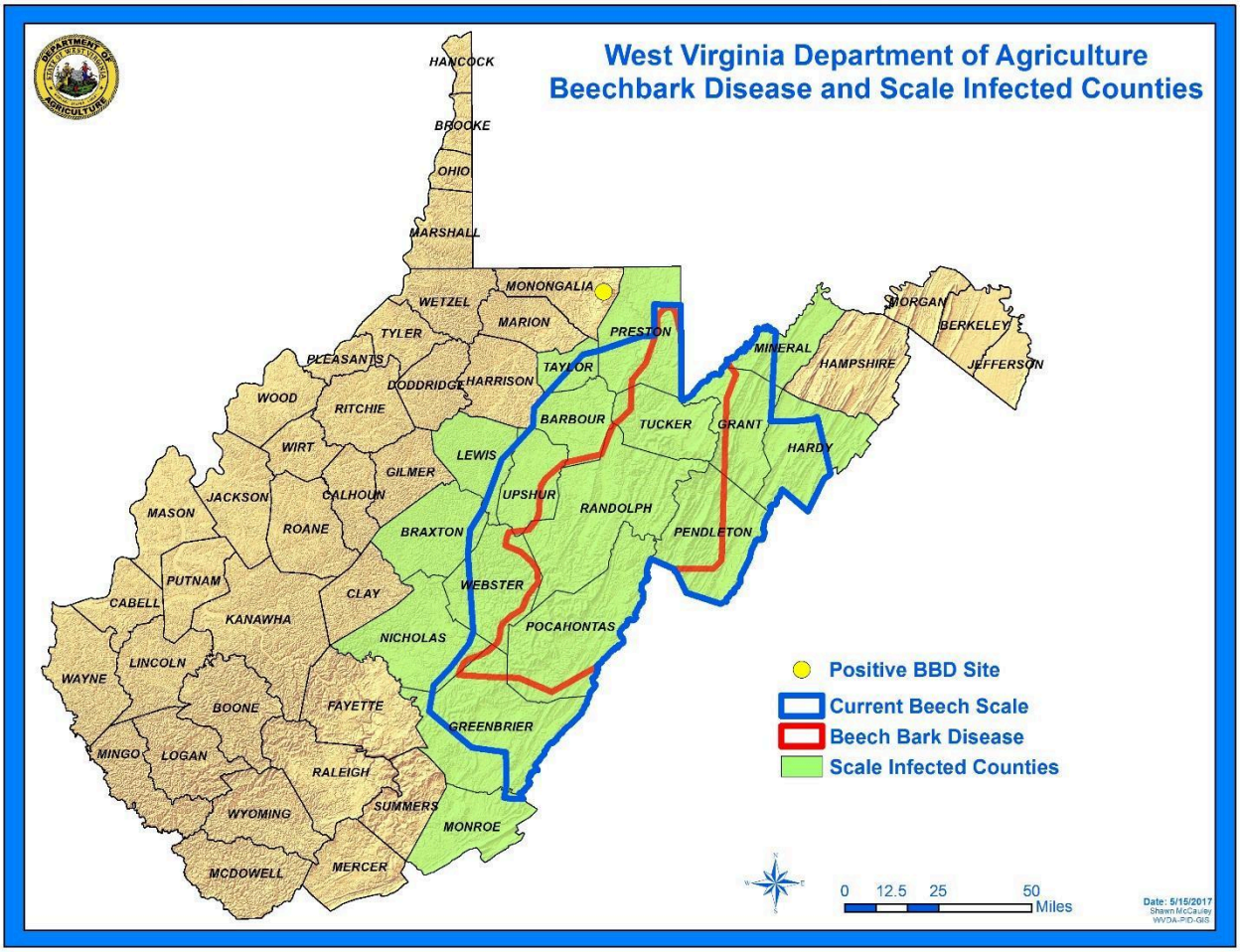
6. SPONGY MOTH REGULATORY PROGRAM

It should be noted that a spongy moth regulatory program does exist although it does not directly affect most landowners. The program monitors the intrastate and interstate movements of spongy moth regulated articles from spongy moth regulated areas to presently "uninfested" counties. Articles include nursery stock; cut Christmas trees, logs, mobile homes and outdoor household articles. West Virginia currently has 44 counties regulated and considered generally infested by Lymantria dispar. The WVDA regulates the movement of articles out of these counties into non quarantined counties or states. There were no new counties quarantined in 2022. More information can be obtained by calling your local WVDA representative.



Beech Bark Disease

Beech Bark Disease is a result of the exotic beech scale insect (*Cryptococcus fagisuga*) infesting American beech trees. These infestations are followed by one of two species of *Neonectria* fungi, *Neonectria faginata* or *Neonectria ditissima* that eventually kill the tree. Currently, the disease is centered in eastern West Virginia (Figure 1). The American beech provides wood products and valuable mast for wildlife every 2-3 years. In our northern forest type, it provides most of the available mast.



The American beech provides wood products and valuable mast for wildlife every 2-3 years. In our northern forest type, it provides most of the available mast.

Management for Beech Bark Disease

Monitor and evaluate the insect and disease status of the stand. The disease begins with many beech scale insects feeding on tree sap while forming a white wooly wax over their bodies. Once the beech scale insects have opened wounds in the bark, the *Neonectria* fungus begins to colonize the bark, cambial layer, and sapwood of the tree. This stage of

the disease produces cankers sometimes resulting in isolated tarry spots oozing from the bark and causes fissures on the outer bark. Disease-free stands should be surveyed at regular intervals to detect the arrival of beech scale.

1) Develop a plan for Beech scale infestation and subsequent infection.
   a. Minimize potential impact by reducing in advance the amount of beech (large trees) in the overstory.

   b. Beech regeneration can be controlled using group selection, individual tree selection or cutting strategies that favor shade intolerant species (i.e. clearcutting or heavy shelterwood).

   c. All trees heavily infested by beech insect scale and/or infected by *Neonectria* spp. should be salvaged, and trees with little or no scale and no *Neonectria* fungus should be retained. In all cases, large, overmature trees should be removed because they serve as targets for intercepting the beech scale and then as infestation for surrounding trees (Houston et al. 1979). Trees with smooth bark should be retained over those with roughened bark since these areas harbor and promote initial infestations.

   d. Dead and dying beech creates hazard trees that endanger people and property because weakened trees are prone to bole breakage called "Beech snap".

Hemlock Woolly Adelgid

Eastern hemlock (*Tsuga canadensis*) is the most shade-tolerant and long-lived tree species in Eastern North America. Its unsurpassed ability to tolerate low light enables it to form dense canopies and stands that provide a unique habitat for many plant and wildlife species. Hemlock Wooly Adelgid is a non-native invasive insect that attacks and kills Eastern and Carolina Hemlock. Once infested and left untreated, trees rarely recover.

Management for Hemlock Woolly Adelgid

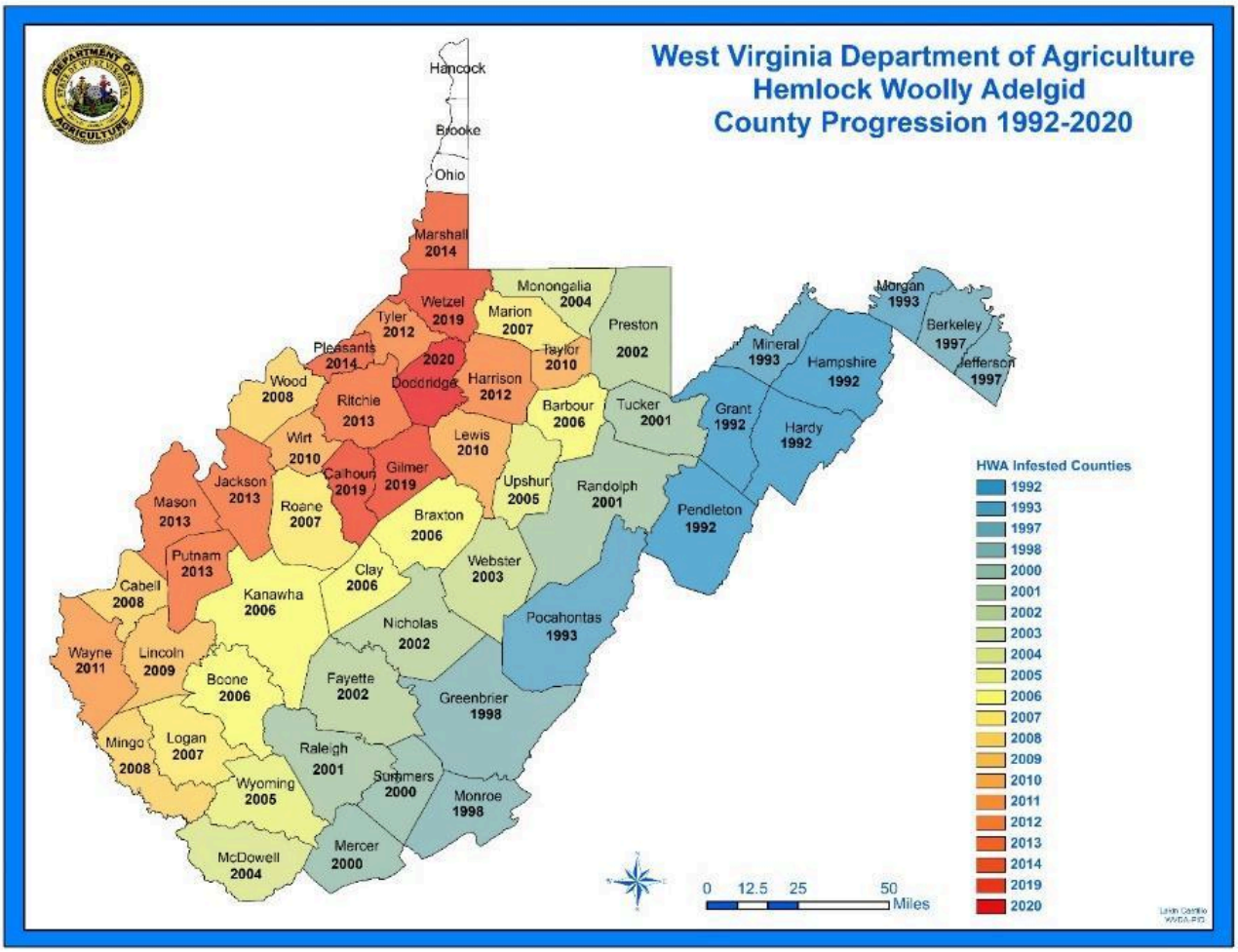
Monitor and evaluate the presence of HWA in your hemlock stands in late March- early April. Look for immobile white wooly masses at the base of needles on the undersides of hemlock twigs. Trees that have been impacted for years will display off-colored needles, often grayish- cast with thinning crowns. HWA is present in most all of West Virginia.

1) Control treatments are available but are labor intensive and expensive and may be suitable for individual trees. Check with your Service Foresters. In forested stands where HWA is present, management options are limited.
   a. Salvage operations and planning for the next stand – remove all Hemlock.

      Hemlocks play an important role in many ecosystems in West Virginia. They provide shelter and thermo-cover for wildlife, cooling shade for trout streams, and coarse woody debris on the forest floor and streams. Consider replacing hemlock by favoring native species such as White Pine or Red Spruce by natural regeneration or planting. Some

non-native hemlock species can also be planted.

b. Forgoing control treatments is another option. In some recreational areas, directional felling of danger trees would be a good practice.



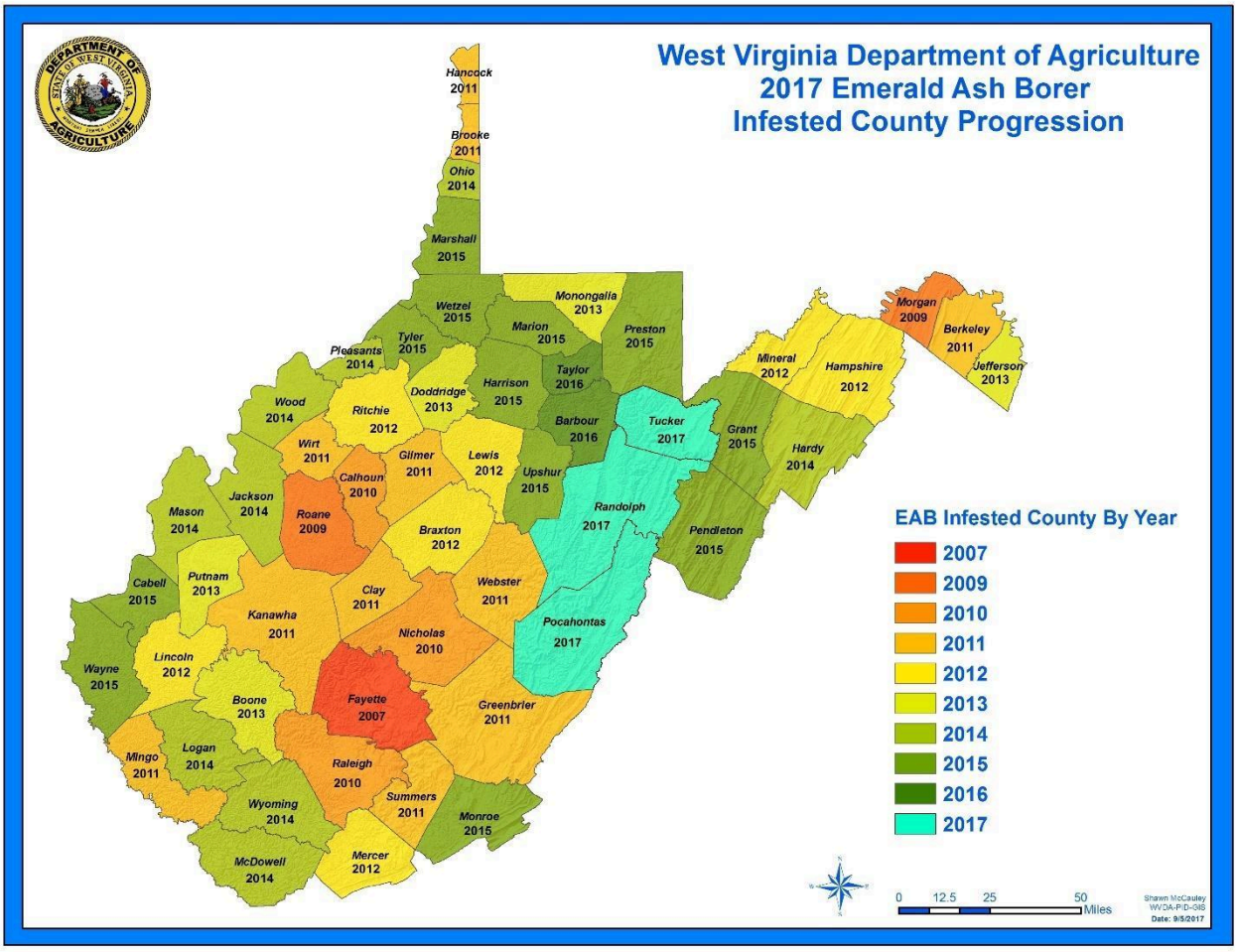
Emerald Ash Borer

White Ash is found in every county in West Virginia. Green Ash can be found in the rich alluvial soils along major water courses. It is conceivable that these species will disappear from our West Virginia Forests. EAB is an exotic beetle from Asia that first appeared in 2007 in West Virginia most likely through the transportation of infested firewood. Emerald ash borer beetles are usually 1/3 to ½ inch long and are usually with metallic emerald green wing covers. The beetles emerge in May to early June and live for about 3 weeks. They feed upon ash foliage, usually leaving small, irregularly shaped patches along the leaf margins. The female will lay approximately 30 to 60

eggs during its lifespan. The eggs are deposited individually in bark crevices or under bark flaps on the trunk or branches. Eggs hatch in 7 to 10 days.

After hatching, the larvae chew through the bark and into the phloem and cambial region. Larvae feed on the phloem for several weeks, creating serpentine galleries packed with fine sawdust-like fass. The larvae overwinter in shallow chambers, excavated in the outer sapwood or in the bark. Pupation begins in late April or early May. The newly formed adults emerge head-first through a D-shaped exit hole.

It is difficult to detect EAB in newly infested trees because they exhibit few, if any, external symptoms. As the EAB densities build, foliage wilts, branches die, and the tree canopy becomes increasingly thin. Many trees appear to lose 30 to 50 percent of the canopy after only a few year of infestation. Trees may die after 3 to 4 years of heavy infestation.



Management for Emerald Ash Borer

The goal of the WV DOF is not to eliminate ash from the forest, but to create a more

diverse forest resource that is resistant to catastrophic changes affecting a single species or genera. Generally, the recommendation is to reduce the ash component of forest stands to a maximum 10% of the total basal area, and to promote tree species diversity. Vigorous pole size and smaller ash should be targeted for retention. Removing one large ash has a much greater effect on reducing EAB population potential than does removing many saplings or a few pole size trees.

Stands with high basal areas of ash present the greatest challenges since it will occur as pockets within the stand. Reducing these pockets may create large canopy gaps. These large openings encourage both ash regeneration and recruitment. Where possible these gaps should be less than 60 feet in diameter. If these large gaps cannot be avoided, then active treatment of ash regeneration may be necessary to keep it at an appropriate level and to encourage species diversity. In some cases, planting a desired mix of tree species may be necessary.

Monitor and evaluate Ash trees in the stand. Controlling the spread of emerald ash borer begins with keeping ash trees healthy and unstressed. The insect is usually spread through human activities, such as moving infested firewood. Prevent ash borer by inspecting firewood closely before purchasing and buy locally when possible. Do not transport firewood if you live in an area that has an ash borer population. Infested trees are identified by canopy dieback, D-shaped exit holes and bark splitting on your ash trees.

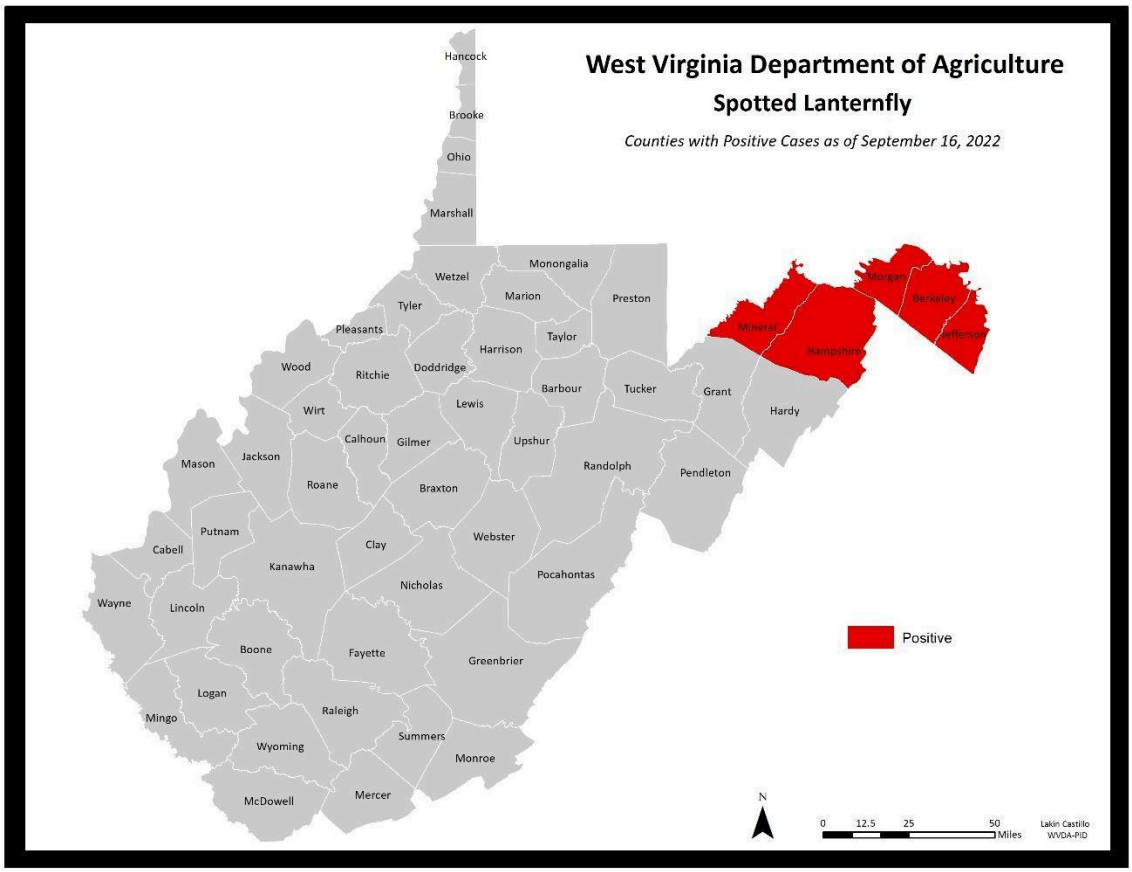
1) Control treatments are available but are labor intensive and expensive and may be only suitable for individual trees. Check with your Service Foresters.
    a. In forested stands where infestation is present:
        i. Remove all infested trees plus all large Ash >12"DBH. Leave small Ash for future stand. Using some of the wood is better than letting it all die and rot.

    b. In forested stands with high value Ash, monitor for EAB annually. Reduce the Ash component in your stand by removing lesser quality trees. Efforts to leave some Ash for genetic stock are more likely to survive if "neighboring threats are reduced". Two to four mature ash per acre with well-formed crowns can serve as seed trees.

    c. To retain stand vigor:
        i. Minimize harvesting damage
        ii. Use current BMPs
        iii. Stay current with new EAB research
        iv. Be aware of EAB locations in West Virginia

Spotted Lanternfly (*Lycorma delicatula*) (SLF) poses risks to both West Virginia's agriculture and forest industries. SLF causes severe damage to several important agricultural and forest crops including grapes and black walnut. These destructive insects damage plants by feeding on a plant's

sap and thus depleting it of water and nutrients. They also damage plants by coating foliage with their excrement. A dark mold grows on the excrement and prevents photosynthetic activity, thereby reducing plant metabolism and indirectly causing decline and eventual death. SLF was first detected in WV in 2019 and is currently found in 6 counties. SLF has a high potential to rapidly spread throughout West Virginia, especially along major transportation routes.



INVASIVE PLANT SPECIES INFORMATION

Invasive Shrub and Tree Control Methods

- Herbicides to use: Systemic herbicides, active ingredients of glyphosate, triclopyr or imazapyr. Make sure the label is read thoroughly to ensure both the plant and habitat are listed as acceptable for treatment.
    - — Cut-stump: involves removing brushy part of plant (ensure no seeds are spread) and treating the cut surface with a concentrated amount of herbicide. Effective as long as ground is not frozen.
    - — Basal bark: involves spraying the base of a plant with a horticultural oil-herbicide mix; best done a foot or so off the ground. Effective as long as ground is not frozen.
    - — Foliar: Best for large patches with few desirable species mixed in. Best to treat in late fall or early spring, when plants are sending resources to their roots.
    - — Hack-and-squirt: For Tree of Heaven, creating a ring of hack marks around the entire tree and squirt a concentrated herbicide solution into the wound; best done in late summer, prevents root suckering.
- Mechanical or manual control: best for small infestations or areas that are sensitive where herbicides cannot be used. Must be done repeatedly to get good results. NOT recommended for Tree of Heaven and other species that readily re-sprout.
- Biocontrol: Rose rosette disease is a native virus spread by mites. It causes rapid elongation of new shoots followed by a "witches broom" growth pattern. The witches broom shoots may take on a reddish or dark orange color. Shoots may also grow in a spiral pattern or have much thicker branches than other shoots. A rose plant will typically die within 1-2 years of infection. Infection can be spread through clipping an infected branch and placing it on a healthy plant.

Invasive Herb Control

- Japanese Knotweed:
    - — Cut stems in June, allow re-growth, and spray with aquatic-approved herbicide in August. Pick up plant pieces as these can resprout.
    - — Can repeatedly mow for several years in a row for small infestations to exhaust roots.
- Purple Loosestrife
    - — Spray in mid-summer and in early fall
    - — *Galerucella* beetles
    - — Can dig out single plants or small clumps, ensuring all root tissue is removed.
- Japanese Stiltgrass
    - — Repeated mowing or hand-pulling for small infestations.
    - — Systemic herbicides or herbicides specific to annual grasses
- Garlic Mustard
    - — Hand-pulling light infestations
    - — Systemic herbicides (i.e. glyphosate) can be used in late fall or early spring.

— Fire can encourage growth.

Invasive Vine Control

- Mile-a-minute
  - — Biological: A weevil has been approved for release in the US (*Rhinoncomius latipesl* that feeds on the weed. WVDA has a release program.
  - — Chemical: Low rate of glyphosate should get approval from WVDA prior to treatment because of Mile-a-Minute's growth habit.
  - — Cultural: Prevent vegetation gaps and disturbances; maintain broad vegetative buffers on riparian zones and forest edges. Can be hand pulled (using gloves) if infestation is small enough.
- Kudzu

— Chemical: General use herbicides (glyphosate, triclopyr, metsulfuron, picloram), spraying as much as possible.

  - — Can combine chemical control with prescribed burns

— Manual: Can mow or cut vines to prevent invasiveness.

— Extensive care must be taken due to growth on and around vital tree species.

THREATENED & ENDANGERED SPECIES

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 and/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 Division of Natural Resources
Wildlife Diversity and Natural Heritage Program
Post Office Box 67
Elkins, WV 26241-0067
Phone: (304) 637-0245
FAX: (304) 637-0250
Email: Brian.P.Streets@wv.gov

Federally Endangered Species for West Virginia:

Indian Bat	*Myotis sodalis*
Virginia Big-eared Bat	*Corynorhinus townsendii virginianus*
Gray Bat	*Myotis grisescens* (Accidental – not seen since 1991)
Eastern Cougar	*Puma concolor couguar* (Probably extirpated)
Clubshell	*Pleurobema claua*
Fanshell	*Cyprogenia stegaria*
James Spinymussel	*Pleurobema collina*
Pink Mucket Pearlymussel	*Lampsilis abrupta*
Tubercied-blossom Pearlymussel	*Epioblasma torulosa eorulosa*
Northern Riffleshell	*Epioblamsa torulosa rangiana*
Harperella	*Ptilirnnium nodosum* (fluviatile)
Northeastern Bulrush	*Scirpus ancistrochaetus*
Running Buffalo Clover	*Trifolium stoloniferum*
Shale Barren Rockcress	*Arabis serotina*

Federally Threatened Species for West Virginia:

Bald Eagle	*Haliaeetus leucocephalus* (DELISTED but still addressed under the Bald and Golden Eagle Protection Act)
Flat-Spired Three Toothed Landsnail	*Triodopsis platysayoides*
Cheat Mountain Salamander	*Plethodon nettingi*
Northern Long Eared Bat	*Myotis septentrionalis*
Virginia Spiraea	*Spiraea virginiana*
Small Wholred Pogonia	*Isotria medeoloides*

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. Critical habitat is defined as: specific geographic areas, whether occupied by listed species or not, that are determined to be essential for the conservation and management of listed species, and that have been formally described in the Federal Register. An area designated as critical habitat is not a refuge or sanctuary for the species. Listed species and their habitat are protected by the Act whether or not they are in an area designated as critical habitat

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, P.O. Box 67, Elkins, WV 26241, telephone number: 304-637-0245.

GENERAL FOREST MANAGEMENT RECOMMENDATIONS

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 Fire Forester or Service Forester for your county or to your local volunteer fire department.

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

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

3. 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.

4. Destructive grazing by livestock and deer can be extremely detrimental to forest trees and regeneration. Therefore, livestock grazing of the woodland should be restricted. A sound deer harvest management plan should be adopted by the landowner to ensure that the deer population is maintained at a level compatible with the capacity of the habitat. In addition, timber harvesting measures (i.e. leaving a significant volume of slash in harvested stand) should be incorporated into timber sale contracts which will help deter browse impacts.

5. 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.

6. 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 scotch pines, Norway spruce, yellow poplar and black walnut. (Note: open areas should typically be retained from a wildlife diversity standpoint; however, if planted with trees, additional mast producing species should be incorporated into plantings to increase wildlife habitat quality.)

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

8. Various silvicultural treatments should be conducted over the woodland acreage. These

include cleanings in sapling hardwood stands, thinning 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.

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

10. 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.

11. Maintain wildlife food species such as dogwood, service berry, hawthorn, crabapple, 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.

12. 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.

13. 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 (refer to Supplemental Materials). A contract prepared by a forester, when followed, prevents damage to the stand and environment and usually results in better prices.

14. 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 generations. A well-managed forest will provide profits and many other amenities on a perpetual basis.

15. Protect important wildlife habitat features such as spring seeps, riparian areas, caves, rock outcrops, etc.

GENERAL TIMBER HARVESTING RECOMMENDATIONS

HARVESTING TREES

Commercial harvests can be conducted to remove mature sawtimber, trees of poor form or quality and undesirable species. It is recommended that trees to be cut be marked by a professional forester and that a sales agreement be prepared to assure the use of good logging practices (refer to Supplemental Materials). 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 the General Cruise Information Table. The proposed harvest cuts should leave adequate residual volume for another harvest in 10 to 12 years while meeting the silvicultural needs of the stand and the wildlife needs for the area along with the landowners objectives and economic desires. 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 logger's 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

Several stands on the tract are inaccessible at the present time; however, several roads will be constructed on the property during the scheduled harvest 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 WV Best Management Practices). 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 fixture. These roads also provide opportunities for woodland recreation such as hunting, fishing, horseback riding, etc.

TIMBER SALE CHECKLIST FOR FOREST LANDOWNERS

DESCRIPTION OF THE HARVEST SITE GUARANTEED BY LANDOWNER

A. Surveyed property lines (possible legal description)
B. Property lines verified with neighboring boundaries
C. Cutting boundaries designated with a margin of safety when near property boundaries
D. Clearly designated cutting boundaries within the land holding

DESCRIPTION OF THE TIMBER TO BE SOLD

A. By marked tree designation (single tree selection, crop tree release, etc.)
B. By merchantable timber designation
C. By species designation
D. By clearcut (must be boundary designation)
E. By diameter limit
F. All require volume estimates (with the appropriate scale specified in each case)

PROTECTING THE PROPERTY (note have the logger register the logging operation with the DOF)

A. Off-site water pollution restrictions
B. Soil protection
C. Waterways - protective measures (specify use of BMP's)
D. Residual tree damage restrictions
E. Structures to protect (fences, bridges, culverts, etc.)
F. Reclamation of critical area requirements
G. Removal of trash provision
H. Logger obligations for fire prevention, suppression and damages

MINIMIZING THE DAMAGE

A. Road planning requirements
B. Equipment specifications and restrictions
C. Wet weather operation restrictions
D. Subletting of contract restrictions
E. Landowner approval, restrictions for roads, skid trails and log landing locations
F. Penalty clauses for excessive damage to residual timber stand

RETIRING THE ROAD SYSTEM

A. Provisions for water diversion structures
    1. Requirements for waterbars on skid trails and broad-based dips on haul roads if future access is required
    2. Requirements for roadside ditching
    3. Providing for culverts and bridges at stream crossings
B. Requirements for final grading of road, out-sloping and crowning
C. Requirements for lime, fertilizer, seed and mulch where required

OWNERSHIP, HANDLING, AND DISPOSAL OF WOOD WASTE

A. State who owns tree tops and slash during the contract period
B. Provide for disposal of wood waste following harvest
C. Provisions for cleanups of log landings

PROVIDING FOR GOOD BUSINESS PRACTICES

A. State how much time allowed for removal of timber (term of contract and provisions for extensions)
B. State the amount, method, and time of payment
C. Provide for liability responsibilities in case of accidents
D. State proper names and signatures
E. Provide for penalties for cutting of unmarked trees (usually two to three times the stumpage value)
F. Make special provisions for building sawmills and other facilities on premises
G. Provide a statement of how the buyer will have access to the property (ingress and egress)
H. Provide for methods for making additions or changes in contracts (require approval in writing by both parties)
I. Provide for third party designations to settle contract disputes

PREPARING TO SELL FOREST PRODUCTS

BEFORE YOU SELL THE TIMBER

A. Know your boundaries
B. Contact professional foresters for a timber cruise and a plan
C. Learn what you have in the way of species, quality, volume, logging limitations and accessibility

OBTAIN INFORMATION REGARDING MARKETS

A. Who is buying the timber?
B. What are some prices being paid?

THE TIMBER SALE INVOLVES DEVELOPMENT OF A PROSPECTUS THAT INCLUDES

A. Description of timber sale
B. A timber showing date
C. Bid opening date
D. Outlines of some pertinent contract provisions

THE CONTRACT SHOULD INCLUDE

A. Legal description
B. Timber for sale description
C. Method of payment
D. Length of contract
E. Special provisions for damage, road developments, restrictions, etc.

THE HARVEST INVOLVES (register the job with the Division of Forestry)

A. Planning the job with the logging contractor to locate:
    1. Timber concentrations
    2. Haul roads
    3. Landings and skid trails
    4. Maintaining buffers (no cut areas)
    5. Planning for water control structures
    6. Determining development of permanent roads vs. temporary roads

MONITORING THE ACTIVE LOGGING JOB INVOLVES

A. Watching for contract compliance
B. Checking on damages
C. Maintenance of water control structures

ENDING THE HARVEST INCLUDES

A. Smoothing and water barring skid roads
B. Smoothing and draining landings
C. Smoothing and draining haul roads
D. Cleaning or removing water control structures
E. Seeding areas disturbed

THE WEST VIRGINIA FOREST WATER QUALITY PROGRAM

A. Is not statutory
B. Water siltation, however, is illegal
C. Includes an educational program
D. Incorporates logging registration
E. Monitors compliance

BEST MANAGEMENT PRACTICES (BMPS)

Practices used in logging to limit erosion and prevent siltation of creeks

A. Planning the operation
B. Using filter strips
C. Using necessary water control structures
D. Maintaining these structures
E. Seeding certain areas when finished

Any decision to initiate a timber harvest on your woodlands can be frightening and even a bewildering experience. However, both educational and technical assistance is available which can lead you through the step-by-step procedures of selling your forest products.

A properly planned timber harvest can result in immediate financial returns along with future benefits such as a more productive woodland, better wildlife habitats and increase property values due to increased accessibility, improved recreational potential for hiking and hunting and the ability to better protect your woodland from fire, insects and disease.

BEST MANAGEMENT PRACTICES (BMPS) FOR 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 habitat.

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 predominately forested, occupied by shrubs and grasses or even have emergents or aquatic beds. There are over 200 different species of birds, mammals, reptiles and amphibians in the eastern United States that to some extent 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 other species.

Therefore, at least a 15’ no cut zone should be maintained. Tree removal is generally not permitted in this zone especially to preserve adequate shading of the stream. A light selection zone for the next 60' should be used where only minimal numbers of carefully selected trees can be removed.

In situations where a forested buffer along a stream does not exist, one should be created by stopping the present use or by planting a forested buffer. In agricultural use areas a minimum total buffer of 95-100' should be established and maintained. Sometimes narrower buffers are sufficient if they are carefully 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.

LOG ROAD SEEDING ALTERNATIVES INFORMATION

SEEDING AND MULCHING SPECIFICATIONS

• All landings will be seeded and mulched.
• All mineral soil disturbed within the Streamside Management Zone will be seeded and mulched. Road fills and other disturbed soil that are not part of a road surface should be seeded and mulched immediately after construction.
• Any road that exceeds 15% slope and is not effectively stabilized must be seeded and mulched.
• All areas seeded and mulched must develop vegetative cover. Lime and fertilizer are not required but proper application may reduce the number of return trips to ensure vegetative catch.
• Compacted soils should be scarified to a depth of 2-3 inches to ensure good seed germination and rooting.
• Straw is the preferred mulch. Use of hay is permissible but not encouraged due to the risk of spreading invasive or exotic species.
• For each section of the planned logging operation, all exposed mineral soil areas that are to be seeded and mulched should have the high berms removed, outsloped, smoothed, water barred and then seeded and mulched immediately after they are no longer needed. Don't wait!

SEED MIXTURE

The goal of any seed mixture is to ensure temporary stabilization of the site and to provide a microclimate and soil conditions conducive to the re-establishment of native vegetation. Wildlife enhancement may be a secondary priority according to landowner desires, but, in any case, the DOF does not recommend seed mixtures containing any WVDNR-designated Threat Level 1 invasive species

SHADED AREAS

- Late summer and fall mix: 30 lbs. Lathco Flat Pea, 50 lbs. winter wheat, 15 lbs. Creeping Red Fescue
- Spring and summer mix: 30 lbs. Lathco Flat Pea, 20 lbs. Annual Ryegrass, 15 lbs. Creeping Red Fescue

SUNNY AREAS

- Late summer and fall mix: 50 lbs. winter wheat, 12 lbs. Crimson or Red Clover, 15 lbs. Creeping Red Fescue
- Spring and summer Mix: 20 lbs. Annual Ryegrass, 12 lbs. Crimson or Red Clover, 15 lbs. Creeping Red Fescue

SEEDING DATES AND RECOMMENDATIONS

• Best months to ensure seeding success are March through June and late August through early October.
• The worst months to seed are July, late October, November, December and January. Seeding can be done during these times, but weather conditions may hinder vegetative establishment.
• Frost seeding or seeding on snow is more likely to succeed in February or early March.
• All legume seeds must be inoculated before seeding.
• Lime and fertilizer will help to ensure vegetative cover on exposed subsoil and dry sites.

FINANCIAL ASSISTANCE AND AGENCY CONTACTS

There are federal government programs that can reimburse a percentage of the cost, not to exceed the maximum rate allowed to a landowner for installing needed conservation practices on their land. All conservation practices have their own specifications and maximum reimbursement rates. These specifications must be met in order to receive payment. Landowners may be required to submit bills, invoices, time sheets, etc. in order to receive payment. If a landowner is interested in obtaining financial assistance on forestry and/or wildlife practices with the Natural Resources Conservation Service (NRCS) and/or Farm Service Agency (FSA) the following steps must be completed. It is highly recommended that landowners call ahead of time to make sure that someone will be in the office that day.

Step 1. Register your property with the local Farm Service Agency (FSA) office to obtain a Farm ID number, if you do not already have one. In order for the FSA to assign a farm number you will need to provide the following information:

1. Complete/file Form AD-2047 (Request for Farm and Producer Record Change).
2. A copy of your deed or a tax tickets with current owners name.
3. Locate the property boundary on maps in the FSA office. (Plat of survey helpful here.)
4. Complete and file Form AD-1026 (Highly Erodible Land Conservation and Wetland Conservation Certification).
5. Complete and file Form CCC-941 (Payment Eligibility Average Adjusted Gross Income Certification).

Failure to submit any of the above paperwork will stop the process until it has been completed. It should be noted that other forms/paperwork may be required based on the status of ownership.

Step 2. Contact your local Natural Resource Conservation Service (NRCS) office and complete and file an application for Environmental Quality Incentives Program (EQIP). For CRP/CREP the local Farm Service Agency (FSA) office will need to be contacted.

Step 3. NRCS, along with other technical service providers, will then meet with you to explain the programs in more detail and determine what practices, if any, are needed. If your application is approved for funding, you will be notified by the local NRCS office and be asked to sign a contract for financial assistance. It is very important that landowners do not begin practices until they are notified that their project has been approved and a contract has been developed and signed. Similar process is implemented with the local FSA office.

USDA CONTACT INFORMATION FOR FINANCIAL ASSISTANCE ON EQIP, AMA, CREP, ETC.

COUNTY	NRCS – ADDRESS AND PHONE NUMBER	FSA – ADDRESS AND PHONE NUMBER
Barbour	16358 Barbour Co. Hwy. Suite 5 Philippi, WV 26416 304-457-4516	USDA Building 200 Sycamore Street Elkins, WV 26241 304-636-6703
Berkeley, Morgan	151 Aikens Center Suite 1 Martinsburg, WV 25404 304-263-7547	151 Aikens Center Suite 5 Martinsburg, WV 25404 304-263-7547
Boone	2631 5th Street Rd. Huntington, WV 25701 304-697-6033	8150 Court Ave #C Hamlin, WV 25523 304-824-3236
Braxton, Clay	1336 State St. Gassaway, WVW 26624 304-364-5103	1336 State St. Gassaway, WV 26624 304-364-5103
Brooke, Hancock, Ohio, Marshall,	1 Ball Park Drive McMechen, WV 26040 304-242-0576	1 Ball Park Drive McMechen, WV 26040 304-242-0576
Cabell, Wayne	2631 5th Street Rd. Huntington, WV 25701 304-697-6033	8150 Court Ave #C Hamlin, WV 25523 304-824-3236
Calhoun, Roane	677 Ripley Rd, Suite 2 Spencer, WV 25276 304-927-1022	677 Ripley Rd, Suite 2 Spencer, WV 25276 304-927-1022
Doddridge, Harrison	87 Ollie Lane Mount Clare, WV 26408 304-624-9232	87 Ollie Lane Mount Clare, WV 26408 304-624-9232
Fayette, Raleigh, Wyoming	465 Ragland Rd. Beckley, WV 25801 304-255-9225	473 Ragland Rd. Beckley, WV 25801 304-253-9597
Gilmer	201 E. Main St. Glenville, WV 26351 304-462-7171	24 Gateway Dr. Weston, WV 26452 304-269-8431
Grant	8 Maple Hill Ave., Suite 2 Petersburg, WV 26847 304-257-4702	8 Maple Hill Ave., Suite 1 Petersburg, WV 26847 304-257-4702
Greenbrier	179 Northridge Dr. Lewisburg, WV 24901 304-645-6172	179 Northridge Dr. Lewisburg, WV 24901 304-645-6172
Hampshire	500 E. Main St. Romney, WV 26757 304-822-3020	500 E. Main St. Romney, WV 26757 304-822-3020

COUNTY	NRCS – ADDRESS AND PHONE NUMBER	FSA – ADDRESS AND PHONE NUMBER
Hardy	223 N. Main St. Moorefield, WV 26836 304-530-2825	223 N. Main St. Moorefield, WV 26836 304-530-2826
Jackson	2118 Ripley Rd. Ripley, WV 25271 304-372-6231	2118 Ripley Rd. Ripley, WV 25271 304-372-6231
Jefferson	209 E. Third Ave. Ranson, WV 25438 304-725-3471	209 E. Third Ave. Ranson, WV 25438 304-725-3471
Kanawha Putnam (FSA)	Keystone Prof. Bldg. 418 Goff Mt Rd, Suite 102 Cross Lanes, WV 25313 304-776-5256	Keystone Prof. Bldg. 418 Goff Mt Rd, Rm 101 Cross Lanes, WV 25313 304-776-5256
Lewis	24 Gateway Dr. Weston, WV 26452 304-269-8431	24 Gateway Dr. Weston, WV 26452 304-269-8431
Lincoln, Logan, Mingo	2631 5th Street Rd. Huntington, WV 25701 304-697-6033	8150 Court Ave #C Hamlin, WV 25523 304-824-3236
Marion	47 Mountain Park Dr. White Hall, WV 26554 304-363-8861	47 Mountain Park Dr. White Hall, WV 26554 304-363-8861
McDowell, Mercer, Summers	Forest Science Lab 241 Mercer Springs Rd Princeton, WV 24740 304-487-1404	473 Ragland Rd. Beckley, WV 25801 304-253-9597
Mineral	67 North Tornado Way, Suite 3 Keyser, WV 26726 304-788-2332	500 E. Main St. Romney, WV 26757 304-822-3020
Monongalia	201 Scott Ave, Suite B Morgantown, WV 26508 304-291-4377	47 Mountain Park Dr. White Hall, WV 26554 304-363-8861
Monroe	190 Highway 3 East Union, WV 24983 304-772-3006	PO Box 497 Union, WV 24983 304-772-3006
Nicholas, Webster	449 Water St., Room 211 Summersville, WV 26651 304-872-1731	1336 State St. Gassaway, WVW 26624 304-364-5103
Pendleton	1205 Petersburg Pike Franklin, WV 26807 304-358-2285	1205 Petersburg Pike Franklin, WV 26807 304-358-2285

Pleasants	201 Underwood Street Middlebourne, WV 26149 304-758-2173	91 Boyles Ln Parkersburg, WV 26104 304-422-9072

COUNTY	NRCS – ADDRESS AND PHONE NUMBER	FSA – ADDRESS AND PHONE NUMBER
Pocahontas	16000 Seneca Trail, Suite B Buckeye, WV 24924 304-799-4317	16000 Seneca Trail, Suite A Buckeye, WV 24924 304-799-4317
Preston	157 Plaza Court, Suite 13 Kingwood, WV 26537 304-329-1923	157 Plaza Court, Suite 13 Kingwood, WV 26537 304-329-1923
Mason Putnam (NRCS)	224-C First Street Point Pleasant, WV 25550 304-675-2020	224-A First Street Point Pleasant, WV 25550 304-675-2020
Randolph, Tucker	200 Sycamore St. Elkins, WV 26241 304-636-6703	200 Sycamore St. Elkins, WV 26241 304-636-6703
Ritchie, Wirt, Wood	91 Boyles Ln Parkersburg, WV 26014 304-422-9072	91 Boyles Ln Parkersburg, WV 26014 304-422-9072
Taylor	16358 Barbour Co., Hwy., Suite 5 Hwy 250 S Philippi, WV 26416 304-457-4516	47 Mountain Park Dr. White Hall, WV 26554 304-363-8861
Tyler, Wetzel	201 Underwood Street Middlebourne, WV 26149 304-758-2173	1 Ball Park Drive McMechen, WV 26040 304-242-0576
Upshur	200 Sycamore St. Elkins, WV 26241 304-636-6703	24 Gateway Dr. Weston WV 26452 304-269-8431

TAX TIPS FOR FOREST LANDOWNERS
https://www.timbertax.org/publications/fs/taxtips/TaxTip2023.pdf

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Forney, Ronald H., Roy B. Clarkson, Christina Nichols Harvey and John Kartesz.

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Kochenderfer, James M., G. W. Wendel, William E. Kidd, Jr. Woodlot Management: Building Roads. West Virginia University Extension Service, Morgantown, West Virginia. Accompanying DVD.

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APPENDIX H STEWARDSHIP PLAN SUPPLEMENTARY MATERIALS

Forestland Issues

BIODIVERSITY

Biodiversity means a variety of life forms. It can be considered at three levels: ecosystem, community and individual species. All three levels are interconnected and hierarchical; species are dependent on communities, which are dependent on the larger ecosystems in which they reside. Biologically diverse ecosystems tend to be more productive and resilient than those with less diversity.

BIOENERGY

Bioenergy is an environmental energy alternative to fossil fuels and may be the key to helping reduce fire danger in the nation's forests. However, several obstacles must be successfully addressed before biomass energy can become viable. First, to make biomass fuel delivery feasible, forest managers must have a viable market within reasonable distance that pays an adequate price. Second, to assure payback of large initial investments, investors in energy production facilities must have a reliable fuel source at prices that allow competitive production over a long enough period. Today, neither of these situations exists. The use of biomass for energy will always be the lowest-value use. Small- diameter or other or non-traditional wood products will out-bid the energy industry for the biomass supply. The biomass energy market, however, can provide a way of disposing of otherwise problematic residual material in a least-cost, if not profitable, manner.

CARBON CYCLE

A carbon sink absorbs CO2 from the atmosphere, and stores it as carbon; in the case of a growing forest, carbon storage is in the form of wood and other vegetation and soil carbon. Young fast-growing forests absorb carbon dioxide more rapidly than older forests. An old forest is characterized by slow-growing trees and carbon losses due to death and decay that may translate to a net loss of carbon overtime. As a result of photosynthesis carbon dioxide is removed from the atmosphere and stored in biomass. This is a part of the carbon cycle known as carbon sequestration. Trees and wood are carbon sinks, accumulating carbon as they grow and acting as stable carbon stores upon maturity. This carbon storage applies even when trees are converted to lumber. When trees die or succumb to fire, their stored carbon is released back into the cycle through decay and combustion.

FOREST HEALTH

Forest health is defined by the US Forest Service as a condition wherein a forest has the capacity across the landscape for renewal, for recovery from a wide range of disturbances, and for retention of its ecological resiliency while' meeting current and future needs of people for desired levels of values, uses, products, and services.

PRESCRIBED FIRE

Prescribed fire is the use of wildland fire to accomplish land and resource management objectives. Prescribed burns, designed to mimic the impact of small natural fires, are often applied on forests that have excessive buildup of flammable materials. Currently, WVDOF statewide procedure allows

for prescribed burning only on National Forests and WVDNR Wildlife Management Areas. Prescribed burning is not approved by WVDOF at any other locations in the state.

Wildlife Diversity Recommendations: Unique Habitat Identification and Management

Landowners contributing to the conservation of West Virginia's natural heritage through excellent forest stewardship will want to identify and manage the unique wildlife habitats on their property. These habitats, places such as natural wetlands, native grasslands, caves and forests that occur on limestone soils and floodplains, frequently harbor animals and plants in great need of conservation attention. They contribute to a tract's diversity of vegetation, and consequently its diversity of wildlife.

Unfortunately many of these habitats are overlooked in planning, or their conservation is not considered to be of value, resulting in some of these wildlife habitat locations being destroyed or degraded. Mapping and managing these habitats is an important component of stewardship for landowners who want to be steward to the full suite of wildlife that may potentially occur on their land. Identification of these places is easy with a basic understanding of their key components (listed in the table below). Managing them appropriately with input from a WV Division of Natural Resources Wildlife Diversity Program or other wildlife biologist can sustain or restore a tract's wildlife diversity; the table below includes some recommendations to consider.

Mapping and conserving these 'at-risk' habitats is also a good way to lessen the risk of impacting rare species federally-listed as endangered or threatened by US Fish and Wildlife Service. Each unique habitat described below has federally-listed species that utilize that habitat along with state 'species in greatest need of conservation' (SGNC) that may use it (SWAP 2006). Many such species are rare because all or part of their life cycle occurs in these uncommon habitats. Some exceptions include the federally threatened small whorled pogonia which occurs in mature mixed hardwood stands (and so is worth a forester and landowner learning to identify) and several federally listed freshwater mussels in our rivers that will benefit by the application of good road building and erosion control practices. For the full report on habitats and species of top conservation concern in the state, see the SWAP online at http://www.wvdnr.gov/Wildlife/PDFFiles/wvwcap.pdf

Unique West Virginia wildlife habitats, associated rare and non-game species, and habitat recommendations (2015 WVDNR State Wildlife Action Plan)

Important Habitats – Habitat Recommendations	**All habitats ranked as High Priority by WVDNR SWAP for the wildlife species dependent on them:**
Caves and karst (limestone bedrock region that incorporates sinkholes, springs, sinking streams, limestone ledges) – Plan timber harvests with buffers around karst features and caves to maintain habitat elements (woody debris, shade, mast producing trees) utilized by SGNC in caves. Give extra attention to protect water quality and flow of 'sinking streams' that once underground are primary habitat for many cave-restricted species	Some species in West Virginia's caves occur nowhere else in the world, and many others are restricted to caves in the Central and Southern Appalachians. Over 75 SGNC require this habitat type and include Indiana (FE) and Virginia big-eared bats (FE), Allegheny woodrats, WV spring salamander, and numerous cave-dwelling invertebrates such as the Madison Cave isopod (FT), spiders, snails, and beetles.

Hemlock Forests – Treat healthy specimens to protect against hemlock wooly adelgid infestations to conserve representative stands (Contact a WVDA Forest Entomologist for treatment information)	If not infested by hemlock woolly adelgid: Habitat for at least 19 SGNC, including Indiana bat (FE), Allegheny woodrat, wood thrush, Cooper's Hawk
Wetlands (forested headwater spring seeps, seasonal woodland (vernal) pools, floodplain forests, forest and shrub swamps, bogs) – Protect existing wetlands from conversion. Protect all wetlands from direct impacts of equipment. Plan timber harvests so that local hydrology (i.e. flow into or from the wetland) is not altered, good water quality is maintained in feeder springs or streams, and the encroachment of invasive plants is limited. Conserve forested wetlands over long term through excellent forest practices.	Habitat for the northeastern bulrush (FE), and over 45 SGNC including bald eagles, Virginia big-eared (FE), other bats, multiple salamanders, frogs, insects, small mammals, and birds. Virginia spiraea (FT) and running buffalo clover (FE) occur in the open rocky river scour zones adjacent to floodplain forests in the New, Gauley, and Bluestone River Basins. Also, critical places to protect for their contribution to watershed hydrology and ecosystem services that regulate water quantity and quality. The number and acreage of floodplain forest systems has been severely diminished in the state and few intact floodplain forests exist.
Calcareous Forests (forests on soils derived from limestone and dolomite) – Protect existing stands from conversion to non-forest uses, conserve forest type over long run through excellent forestry practices; plan timber harvests to minimize encroachment of invasive plants.	Habitat for at least 21 SGNC including Virginia big-eared bat (FE), running buffalo clover (FE), Allegheny woodrat, cerulean warbler.
Cliffs, rock outcrops, and Talus (sparsely vegetated rock exposures, many with all three components together) – Plan timber harvests with a buffer around these systems to maintain the habitat elements (woody debris, perches, and mast producing trees) needed by SGNC and to prevent direct impacts to SGNC by equipment.	At least 18 SGNC such as the Virginia big-eared bat (FE), flat-toothed three-spired landsnail (FT) (a Cheat River Gorge endemic), peregrine falcon, and timber rattlesnakes.
Red Spruce Forest – Protect and maintain spruce stands, release naturally regenerating spruce within northern hardwood stands, plan timber harvests to minimize encroachment of invasive plants	Habitat for 20 SGNC, including Cheat Mountain Salamander (FT), West Virginia north flying squirrel (until recently FE), northern saw-whet owl).
Woodlands (student trees, open canopy), native grasslands, and glades (herbaceous openings) on shallow soils of shale, limestone or sandstone (non-forest because of hot and dry conditions) – Protect sites from development (e.g. road construction, quarrying), plan timber harvest in adjacent stands to minimize encroachment of invasive plants.	Harbor several herbaceous plant species that are restricted to these habitats, including shale barren rockcress (FE) that occur nowhere else in the world except in the Central Appalachians. Wildlife habitat for Virginia big-eared bat (FE), and many species of butterflies and beetles ranked as SGNC.

SGNC: Species in Greatest Need of Conservation FT: Federally Threatened
FE: Federally Endangered

Habitat Management Recommendations

for General Wildlife Diversity

Planning Checklist

Important Habitat Components and Habitat Recommendations	Habitat Component Priority	Recommended No. or %:	Existing Units:	Planned Units:
Early successional forested habitat sapling stage (0-20 year age class) with heavy stem densities — diversity of hard and soft mast producing species (i.e. dogwood, hawthorn, crabapple, apple, black haw) preferred. Northern and northeast facing slopes typically are the most productive sites. Even age silvicultural techniques and field border cuts are commonly utilized to accomplish this objective (a few mast producing trees and shrubs may be in out areas).	High	15-20%		
Mature deciduous forested habitat with a diversity of understory and herbaceous vegetation with a significant portion of the stocking in hard mast (i.e. oak, beech) production. Thinnings and selective harvests are commonly utilized to reduce BA to enhance mast production and understory vegetation.	High	40-60%		
Herbaceous forested openings, savannas and/or linear openings (skid roads, pipelines, etc.) dispersed throughout forested areas, and/or haylands and pasture fields bordering forested habitat provide important brood habitat. Legume/grass cover such as white clover, birdsfoot trefoil, creeping red fescue, tick trefoil, orchard grass is recommended	High	5-10%		
Openlands such as haylands, pasturelands can be enhanced by conversion to legume and/or warm season grass cover based upon management objectives. A portion of openland habitat should be bordered by early successional forests. In addition, forest edges along openings can be “feathered back” utilizing border cuts.		If Applicable		
Snags – maintain snags in forested stands by leaving dead or dying trees	Medium	Min. 3-5 / acre		
Mow forest openings, logging roads, rights-of-way, etc. on an annual or biennial basis — mowing should be delayed until July 15. In larger and openings, a portion of the may be placed on a longer mowing rotation to allow it to revert to old field stage habitat which provides for additional diversity in plant communities.		If Applicable		
Waterholes and or vernal poets should be constructed in areas lacking standing water (i.e. dry ridge tops, upper slopes) benefit to many species including amphibians, bats, etc.	Medium	As Needed		
Protection of seeps and riparian areas from bad environmental impacts — 100 foot buffers commonly recommended. Maintain mast producers in vicinity of seeps light thinnings are permissible to enhance mast production in these areas.	High	As Needed		

Brush piles and windrows constructed along forested edges of openland habitat and/or fencerows. Brushpiles provide escape and nesting cover for an assortment of songbirds and mammals.	Medium	If Applicable		
Live den and cavity trees — retain cull trees and snags of various DBHs in forest stands to provide trees for cavity using wildlife.	High	5-7 / acre		
Evergreen forested habitat — conifers, mountain laurel, and rhododendron preferred in close proximity to hard mast production and early successional habitat components.	Medium	5-10%		
Large woody debris such as large tops and cull logs should be per acre sustained in forested stands to provide habitat for a diversity of species.	Medium	1-3 per acre (min. 30 ft. and 8" Dia.)		
Small grain food plots (min. of 1 acre in size) - left unharvested and fallow for the following year. Preferred species include corn, milo sorghum, wheat, sunflower, buckwheat.	Low	5%		
Livestock should be excluded from woodland areas to eliminate impacts to forest regeneration and stand composition.		100% (unless small portion retained for shade for livestock)		
Artificial nesting structures — If natural cavities arc a limiting factor, manmade structures can be constructed for a variety of wildlife species (i.e. squirrel, owls, bluebirds, wood ducks, etc.).		If Applicable		
Orchards (i.e. apple) and soft mast producing thickets (i.e. crabapple, hawthom) should be maintained. In addition, these areas can be enhanced by pruning and releasing fruit-bearing trees.		If Applicable		

Important Wildlife Foods: American beech, oak, greenbrier, black cherry, grapes, black walnut, paw paw, hickory, dogwood, hawthorn, sumac, hop-hornbeam, viburnums, birch, alder, aspen, sassafras, persimmon, black gum, clover/grasses, various forbs, ferns, mountain laurel, rhododendron, witch-hazel, serviceberry, blueberry, huckleberry, insects (summer months)

Notes:

- ✔ Mature white oak stands with conifer cover should be retained.
- ✔ Snags can be created by girding trees.
- ✔ Control of invasive plant species is recommended.
- ✔ As a rule of thumb, trees typically have to be 40-50 years of age to provide quality den sites.
- ✔ As a rule of thumb, trees typically have to be 30-40 years of age to produce hard or soft mast.
- ✔ In oak-hickory dominated stands, timber rotations will typically range between 100 and 140 years depending upon species composition (red oak dominated stands shorter rotations, white oak dominated stands - longer rotations.
- ✔ Scattered or small clumps of spruce/pine scattered throughout deciduous stands are more valuable than solid pine plantations.
- ✔ Retention of 3-5 mature trees which exhibit exfoliating bark characteristics (i.e. shagbark hickory) should be left in timber sales as potential roosting areas for bats.
- ✔ As a rule of thumb, optimum size for herbaceous forest openings is 2 to 4 acres. \
- ✔ Typically 10-15 sq. ft. of BA/acre of select mast producing tree and shrubs can be left in even age cuts without impacting regeneration of the stand.
- ✔ Retain genetically superior mast producing trees during timber harvests.

- ✔ Defoliated bark tree species (e.g. shagbark hickory, elm) should be retained in timber sales, when feasible, to provide potential roosting sites for bats.
- ✔ Rock outcrops should be protected from logging and other activities due to their value as donning areas for an assortment of wildlife species (i.e. timber rattlesnakes, wood rats, etc.).
- ✔ A sound deer harvest management plan to maintain deer populations at desirable levels is important so as not to have a negative impact on forest regeneration and subsequent stand composition.

General Wildlife Diversity – November 9, 2009

Habitat Management Recommendations for Wild Turkey

Planning Checklist

Important Habitat Components and Habitat Recommendations	Habitat Component Priority	Recommended No. / %	Existing Units	Planned Units:
Mature deciduous forested habitat with a diversity of understory and herbaceous vegetation with a significant portion of the stocking in hard mast (i.e. oak, beech) production in oak forest, and cherry and beech in northern types. Thinnings and selective harvests are commonly utilized to reduce BA to enhance mast production and understory vegetation.	High	50-75 %		
Herbaceous forested openings, savannas and/or linear openings (skid roads, pipelines, etc.) dispersed throughout heavily forested areas, and/or haylands and pasture fields bordering landscapes, and up forested habitat provide important brood habitat. Legume/grass cover such as white clover, birdsfoot trefoil, agricultural settings orchard grass, tick trefoil, and red creeping fescue is recommended.	High	Min. 10% in heavily forested landscapes, and up to 40% in agricultural settings		
Mow forest openings, logging roads, rights-of-way, etc. on an annual or biannual basis – mowing should be delayed until after July 15.	Medium	If Applicable		
Protection of seeps and riparian areas bad environmental impacts. Maintain mast producers in vicinity of seeps light thinnings are permissible to enhance mast production in these areas.	High	If Applicable		
Wild turkeys obtain a portion of their water needs from surface water in very dry regions. Therefore, waterholes and/or vernal pools should be developed in areas lacking	Medium	As Needed		
Evergreen forested habitat – mixed deciduous forests interspersed with conifers provided quality roosting areas.	Low	5-10%		
Minimize human disturbance (especially vehicular - ATVs) during nesting and brood rearing seasons - April 15 to July 15).	High			
Retention and/or development of wild grape arbors and/or grape vines reaching canopy — select mast producing arbors/acre trees of lower quality (remove grape vines from best crop trees and mast producers).	Medium	3-5 vines and 1-2 arbors / acre		
Livestock should be excluded from woodland areas to eliminate impacts to forest regeneration and stand composition.	High	100% (unless small portion retained for shad for livestock)		

Important Wild Turkey Foods: beech, oak, greenbrier, black cherry, grapes, dogwood, hawthorn, sumac, black gum, viburnums, clover/grasses, mountain laurel, witch-hazel, serviceberry, blueberry, blackberry, huckleberry, various forbs, insects (summer months)

Notes:

- ✔ Mixed hardwood stands should be placed on a long term rotations depending on species composition. In oak-hickory dominated stands, timber rotations will typically range between 100 and 140 years depending upon species composition (red oak dominated stands – shorter rotations, white oak dominated stands – longer rotations)
- ✔ In mixed oak stands, white oak is typically favored over the red oak group; however, timber marking efforts should be conducted in a manner to insure that oak species diversity is maintained throughout the stand.
- ✔ Approximate home range size — 500 acres — habitat components should he implemented within this acreage, if applicable.
- ✔ As a rule of thumb, optimum size for herbaceous forest openings is 2 to 4 acres.
- ✔ Scattered or small clumps of spruce/pine scattered throughout deciduous stands are more valuable than solid pine plantations.
- ✔ Native grasses such as bluestem and switchgrass can provide valuable nesting cover and should be considered for establishment in larger fields (>5 acres) with a minimum plot size of 1 acre.
- ✔ The interspersion of the required habitat components in close proximity to each other is key in providing quality wild turkey habitat.
- ✔ Kentucky 31 fescue should not be included in any herbaceous seed mixes.
- ✔ A sound deer harvest management plan to maintain deer populations at desirable levels is important so as not to have a negative impact on forest regeneration and subsequent stand composition.

Habitat Management Recommendations for Gray and Fox Squirrels

Planning Checklist

Important Habitat Components and Habitat Recommendations:	**Habitat Component Priority:**	**Recommended No. / %**	**Existing Units**	**Planned Units**
Mature deciduous forested habitat — hard mast (i.e. oak, hickory, beech) production with a moderate understory of shrubs and vines. Even-age regeneration cuts should be long and linear instead of block shaped.	High	75-100%		
Retention and/or development of wild grape arbors and/or grape vines reaching the canopy - select mast producing trees of lower quality (remove grape vines from best crop trees and mast producers).	Medium	3-5 vines/acre		
Live trees with cavity openings should be retained when timber harvests are conducted.	High	2-3/acre		
Protection of seeps and riparian areas from bad environmental impacts. Maintain mast producers in vicinity of seeps — light thinnings are permissible to enhance mast production in these areas.	Medium	As Needed		
Waterholes — Squirrels obtain the majority of their water needs from dew and succulent vegetation. However, on dry sites, water holes may have limited value for squirrels.	Low	As Needed		
Livestock should be excluded woodland areas to eliminate impacts to forest regeneration and composition, and competition for food.		100% (unless small portion retained for shade for livestock)		
Grain crops (i.e. corn, soybeans) — A few rows of unharvested grain crops left along woodland edges can provide a quality food source for fox squirrels in agricultural settings.	Low	If Applicable		
Important Squirrel Foods: Oak, beech, hickory, black walnut, black cherry, grapes, dogwood, yellow poplar, maple, black gum, mulberry, elm, fungi, hawthorn, field corn				

Notes:

- ✔ In oak-hickory dominated stand, timber rotation will typically ranged between 100 and 140 years, depending upon species composition (red oak dominated stands – shorter rotations, white oak dominated stands – longer rotations). Shorter rotations for squirrels and quality timber are both primary goals of the landowner.
- ✔ Approximate home range size 10 acres — habitat components should be implemented within this acreage, if feasible
- ✔ Artificial nesting structures have been utilized effectively in forested stands which exhibit good hard mast production, but have limited natural cavities.
- ✔ As a rule of thumb, trees typically have to be 40-50 years of age to provide quality den sites.
- ✔ In mixed oak stands, white oak is typically favored over the red oak group; however, timber marketing efforts should be conducted in a manner to insure that oak species diversity is maintained throughout the stand.
- ✔ Cavity trees with a den hole opening of approximately 3 inches in diameter are preferred by squirrels.
- ✔ Retain genetically superior mast producing trees during timber harvests.

- ✔ A sound deer harvest management plan to maintain deer populations at desirable levels is important so as not to have a negative impact on forest regeneration and subsequent stand composition.

Squirrel Planning Checklist - November 9, 2009

Habitat Management Recommendations for Ruffed Grouse

Planning Checklist

Important Habitat Components and Habitat Recommendations:	Habitat Component Priority:	Recommended No. / %	Existing Units:	Planned Units:
Early successional forested habitat — sapling stage (0-20 year age class) with heavy stem densities — diversity of hard and soft mast producing species (i.e. dogwood, hawthorn, and crabapple, apple, black haw) preferred. Northern and northeast facing slopes typically are the most productive sites. However, south and west slopes are most critical for winter habitat. Even age silvicultural techniques and field border cuts are commonly utilized to accomplish this objective (a few mast producing trees and shrubs may be in cut areas).	High	25-40% (dependent upon forest types and quality, and timber rotations)		
Mature deciduous forested habitat — hard and soft mast (i.e. oak, beech, cherry) production interspersed in close proximity to early successional habitat and herbaceous openings - diversity of species preferred. Thinnings may be needed to reduce basal area to enhance mast production.	High	Min. 25%		
Herbaceous forest openings and/or linear openings (skid roads, rights-of-way, etc.) with early successional forested edges - dispersed throughout forested landscape. Legume/grass cover such as white clover, birdsfoot trefoil, orchard grass, tick trefoil and red creeping fescue is recommended.	High	5-10%		
Mow forest openings, logging roads, rights-of-way, etc. on annual or biennial basis — mowing should be delayed until July 15.		If Applicable		
Protection of seeps and riparian areas from bad environmental impacts. Maintain mast producing trees and shrubs in vicinity of seeps - light thinnings are permissible to enhance mast production in these areas.	Medium	If Applicable		
Retention and/for development of wild grape arbors and/or grape vines reaching the canopy— select mast producing trees of lower quality (remove grape vines from best crop trees and mast producers).	High	Min. 3-5 vines/acre and or 1-2 arbors/acre		
Evergreen forested habitat — conifers, laurel, and rhododendron — preferred in close proximity to hard mast production and early successional habitat components.	High	Min. 5-10% (up to 50% where winter cover is lacking)		
Drumming logs (located in even-age timber harvests) — logs should be a minimum of 16 inches in diameter and 8 feet in length and positioned along contour of land.	Medium	Min. 2-3 per acre		
Livestock should be excluded from woodland areas to eliminate impacts to forest regeneration and stand composition.		100% (unless small portion retained for shade for livestock)		

Minimize human disturbance (especially vehicular traffic - ATVs) during nesting and brood rearing seasons — April 15 to July 15.				

Important Ruffed Grouse Foods: beech, oak, greenbrier, black cherry, grapes, dogwood, hawthorn, sumac, hop-hornbeam, viburnums, birch, alder, aspen, clover/grasses, ferns, cinquefoils, mountain laurel, witch-hazel, serviceberry, blueberry, huckleberry, insects (summer months)

Notes
:

- ✔ Guidelines above apply to managing for grouse habitat in mid and southern Appalachian regions which includes West Virginia where aspen is not an important food and cover component.
- ✔ Mature white oak stands with conifer cover should be retained.
- ✔ ~~Approximate home range size 75 acres — habitat components should be implemented within this acreage when~~ feasible.
- ✔ Typically 10-15 sq. ft. of BA/acre of select mast producing tree and shrubs can be in even age cuts without impacting regeneration of the stand.
- ✔ Scattered or small clumps of spruce/pine (especially low-growing) scattered throughout the deciduous stand are more valuable than solid pine plantations.
- ✔ Orchards (i.e. apple) and mast producing thickets (i.e. crabapple, hawthorn) should be maintained.
- ✔ Retention of slash (i.e. tops, small diameter trees) within harvested areas can provide a good deterrent toward deer browsing impacts to regeneration cuts in areas where deer browsing is an issue.
- ✔ The interspersion of the required habitat components in close proximity to each other is key in providing quality ruffed grouse habitat.
- ✔ A sound deer harvest management plan to maintain deer populations at desirable levels is important so as not to have a negative impact on forest regeneration and subsequent stand composition.
- ✔ ~~Retain genetically superior mast producing trees during timber harvests.~~

Ruffed Grouse Planning Checklist - November 9, 2009

Habitat Management Recommendations for White-tailed Deer

Planning Checklist

Important Habitat Components and Habitat Recommendations:	Habitat Component Priority:	Recommended No. / %	Existing Units:	Planned Units:
Early successional forested habitat — sapling stage (0-20 year age class) with heavy stem densities — diversity of hard and soft mast producing species (i.e. dogwood, hawthorn, and crabapple, apple, black haw) preferred. Northern and northeast facing slopes typically are the most productive sites. However, south and west slopes are most critical for winter habitat. Even age silvicultural techniques and field border cuts are commonly utilized to accomplish this objective (a few mast producing trees and shrubs may be in cut areas).	High	25-35%		
Mature deciduous forested habitat with a diversity of understory and herbaceous vegetation with a significant portion of the stocking in hard mast (i.e. oak, beech) production in oak forest, and cherry and beech in northern types. Thinnings and selective harvests are commonly utilized to reduce BA to enhance mast production and understory vegetation.	High	40-60%		
Herbaceous forest openings and/or linear openings (skid roads, rights-of-way, etc.) with early successional forested edges - dispersed throughout forested landscape. Legume/grass cover such as white clover, birdsfoot trefoil, orchard grass, tick trefoil and red creeping fescue is recommended.	High	15-25%		
Openlands such as haylands, pasturelands can be enhanced by conversion to legume and/or broadleaf cover based upon management objectives. A portion of openland habitat should be bordered by early successional forests.	Medium	If Applicable		
Mow forest openings, logging roads, rights-of-way, etc. on an annual or biennial basis — mowing should be delayed until July 15. In larger fields and openings, a portion of the fields may be placed on a longer mowing rotation to allow it to revert to old field stage habitat which provides for additional diversity in plant communities which is preferred habitat for white-tailed deer	High	If Applicable		
Waterholes should be constructed in areas lacking standing water (Le. dry ridge tops) and other areas which may lack water during portions of the year. A rule of thumb is that deer should have a minimum of one water source for each sq. mile.	Medium	As Needed		
Protection of seeps and riparian areas from environmental impacts. Maintain mast producing trees and shrubs in vicinity of seeps — light thinnings are permissible to enhance mast production in these areas.	High	If Applicable		

Retention and/or development of wild grape arbors and/or grape vines reaching the canopy— select mast producing trees of lower quality (remove grape vines from best crop trees and mast producers).	High	3-5 / acre		
Evergreen forested habitat — conifers, mountain laurel, and rhododendron preferred in close proximity to hard mast production and early successional habitat components.	Medium	5-10%		
Livestock should be excluded from woodland areas to eliminate impacts to forest regeneration and stand composition.		100% (unless small portion retained for shade for livestock)		
Orchards (i.e. apple) and soft mast producing thickets (i.e.: crabapple, hawthorn) should be maintained. In addition, these areas can be enhanced by pruning and releasing fruit-bearing trees.	High	If Applicable		
Small grain food plots (min. of an acre in size) or agricultural fields - leave a portion of fields unharvested and fallow for the following year. Preferred species include corn, milo sorghum, wheat, sunflower, buckwheat.	Low	0-10%		
Important wildlife foods: oak, beech, black cherry, grape, dogwood, hawthorn, hickory, apple, black gum, greenbrier, rhododendron, blueberry, viburnums, crabapple, grasses, legumes, forbs, browse-twigs (numerous species)				

Notes:

- ✔ Mature white oak stands with conifer cover should he retained.
- ✔ Approximate home range size - 640 acres - habitat components should be implemented within this acreage when feasible.
- ✔ Typically 10-15 sq. ft. of BA/acre of select mast producing tree and shrubs can be left in even age cuts without impacting regeneration of the stand.
- ✔ Clamps of spruce/pine (especially low-growing) scattered throughout the deciduous landscape and/or pine plantations are utilized by deer for escape and winter cover.
- ✔ Retention of slash (i.e. tops, small diameter trees) can provide a good deterrent for deer browsing impacts to regeneration cuts in areas where deer browsing is an issue.
- ✔ Supplemental feeding (i.e. deer feeders) should not be incorporated into wildlife management plans.
- ✔ There are a variety of commercial dealers which provide quality herbaceous plant mixes for wildlife openings. Do not plant invasive species.
- ✔ In mixed oak stands, white oak is typically favored over the red oak group; however, timber marking efforts should be conducted in a manner to insure that oak species diversity is maintained throughout the stand.
- ✔ A sound deer harvest management plan to maintain deer populations at desirable levels is important so as not to have a negative impact on forest regeneration and subsequent stand composition.

White-tailed Deer Planning Checklist November 9, 2009

50 things you can do to help protect your home from wildfire

No Cost, Just A Little Time

- Perform a *FIREWISE* assessment of your home.
- Move your firewood pile out of your home's defensible space.
- Clean your roof and gutters of leaves and pine needles (best done in November).
- Clear the view of your house number so it can be easily seen from the street.
- Remove conifer shrubs from your home's defensible space, especially if your home is in a high-risk area.
- Put a hose (at least 100' long) on a rack and attach it to an outside faucet.
- Trim all tree branches if they overhang your house.
- Trim all tree branches from within 20' of all chimneys.
- Remove trees along the driveway to make it at least 16' wide.
- Prune branches overhanging the driveway to have a minimum 16' overhead clearance.
- Maintain a green lawn for 30' around your home.
- If new homes are still being built in your area, talk to the developer and local zoning officials about building standards.
- Develop and discuss an escape plan for your family and pets. Have a practice drill.
- Get involved with your community's disaster mitigation plans.
- Check your fire extinguishers. Are they still charged? Are they easy to get to in an emergency? Does everyone in the family know where they are and how to use them?
- Clear deadwood and dense flammable vegetation from your home's defensible space.
- Review your homeowner's insurance policy for adequate coverage. Consult your insurance agent about costs of rebuilding and repairs in your area.
- Talk to your children about not starting fires or playing with matches.
- If you have a burn barrel that you use for burning trash, *STOP!* Burning trash is illegal in West Virginia.
- Compost leaves in the fall, don't burn them.
- If you burn your brush piles or garden debris, follow state burning regulations and local ordinances – use common sense when burning – don't burn on a windy day.
- Always have a shovel on hand and hook up the garden hose *BEFORE* you start the fire.
- Never burn if the smoke and flames are blowing towards your home (or your neighbor's home).

Minimal Cost Actions *($10 – $25 and a little time)*

- Install highly visible house numbers (at least 4" tall) on your home.
- Install big, highly visible house numbers (at least 4" tall) at the entrance of the driveway onto the street. Use non-flammable materials and posts.
- Install metal screens on all attic, foundation, and other openings on your home to prevent accumulation of leaves and needles.
- Hold a neighborhood meeting to talk about fire safety. Invite your local fire chief. Have coffee and donuts for neighbors.
- Install a fire extinguisher in the kitchen *AND* the garage.

- Install a metal shield between your home and an attached wood fence or deck.
- Replace conifer and evergreen shrubs with low-flammable plants in your home's defensible space.
- Prune and thin conifer trees that are located within 30' to 100' of your home.
- Purchase and use a *NOAA* weather alert radio. Many types of emergencies are announced through this service.
- Install a spark arrestor or heavy wire screen with openings less than 1/2" on wood burning fireplaces and chimneys.

Moderate Cost Actions *($50 - $250 and a little more work)*

- Build a gravel turnaround area near your house big enough to allow a fire truck to turn around.
- Join your neighbors in creating an additional access road into your neighborhood. Share the costs.
- Modify driveway gates to accommodate fire trucks. They should be at least 12' wide and set back at least 30' from the road. If locked, use a key box approved by your local fire department or use or a chain loop with a lock that can be cut in an emergency.
- Replace vinyl gutters and downspouts with non-flammable, metal gutters and downspouts that incorporate easily cleaned or non-clogging features.
- Treat flammable materials like wood roofs, decks and siding with fire retardant chemicals.
- Enclose decks to prevent accumulation of leaves, needles, and debris. Include a metal screen with a 1/4" or less mesh opening to prevent sparks from getting under the deck.

High Cost Actions *(more than $500)*

- Replace your roof with fire-resistant materials such as Class A shingles, metal or tile.
- Install a roof irrigation system to protect your home's roof.
- Install an independent water supply for a sprinkler system with a non-electric (e.g. propane) powered pump capable of running unattended for 24 hours.
- Replace wood or vinyl siding with non-flammable material.
- Replace single-pane glass windows and plastic skylights with tempered, double-pane glass.
- Box in roof eaves, fascias, and soffits with aluminum or steel materials with metal screens to prevent entry of sparks.
- Have electric service lines to your house placed underground.
- Relocate propane tanks inside the defensible space but at least 10' from the house.
- Have non-flammable ground cover such as gravel under and around propane tanks for 10'.
- Improve driveway culverts and bridges to accommodate the weight of a fire truck.
- Improve your driveway by straightening sharp curves and filling in sharp dips that would hinder a fire truck.

(Modified from original list compiled by Minnesota DNR Firewise Program)

Please visit these websites for more information on Firewise and how to make your home or community safer from wildfire:

FIREWISE USA™
RESIDENTS REDUCING WILDFIRE RISKS

WEST VIRGINIA DIVISION OF FORESTRY
www.wvforestry.com

WEST VIRGINIA
FOREST FIRE LAWS

The periods of each year between March 1 and May 31, inclusive, and October 1 and December 31, inclusive, are hereby designated as Forest Fire Seasons.

No person shall during ANY such fire season, except between the hours of 5:00 p.m. and 7:00 a.m. prevailing time, set on fire or cause to be set on fire any forest land, or any grass, grain, stubble, slash, debris or other inflammable materials. Any fire set during this time shall be extinguished prior to 7:00 a.m. prevailing time. Such prohibition of fires between 7:00 a.m. and 5:00 p.m. prevailing time shall not be construed to include (1) small fires set for the purpose of food preparation, or providing light or warmth around which all grass, brush, stubble, or other debris has been removed for a distance of ten feet from the fire, and (2) burning which may be conducted at any time when the ground surrounding the burning site is covered by one inch or more of snow.

No burning may be done unless all inflammable material has been removed from around the material to be burned as a safety strip for a distance which insures that the fire will not escape and which is not less than 10 feet. If fire escapes beyond the safety strip, the person responsible shall be guilty of a misdemeanor.

Before leaving ANY fire for ANY period of time, it must be totally extinguished.

Commercial permits to burn during the prohibited periods may be issued by the Division of Forestry.

All sawmills, power shovels, or an engine or machine capable of throwing sparks must be provided with an adequate spark arrestor if operating on land subject to fire by any cause.

All inflammable waste disposal areas on ANY land must annually have removed all grass, brush, debris and other inflammable material adjacent to such disposal areas to provide adequate protection to prevent the escape of fire to adjacent lands.

The State shall recover from the person or persons, firms or corporations whose negligence or whose violations of any provisions of this article cause ANY fire at ANY time on any grass or forest land the amount expended by the State.

A landowner must take all practicable means to suppress ANY fire on his property. If he fails to do so, the State shall collect from him the amounts expended by the State for such purposes.

WV Division of Forestry
1900 Kanawha Boulevard, East
Charleston, WV 25305-0180
304) 558-2788/FAX (304) 558-0143
www.wvforestry.com

5:00 P.M.

BURNING LAW

MARCH 1 - MAY 31
5:00 P.M. - 7:00 A.M.

OCTOBER 1 - DECEMBER 31
5:00 P.M. - 7:00 A.M.

MAXIMUM FINE: $1,000.00
FOR VIOLATING THE BURNING LAW

BURNING LAWS IN BRIEF

- NO BURNING FROM 7 A.M. UNTIL 5 P.M.
- FIRE MUST BE ATTENDED AT ALL TIMES
- AREA MUST BE CLEARED DOWN TO MINERAL SOIL
- FOR A MINIMUM DISTANCE OF 10 FEET AROUND WHAT IS BEING BURNED.
- IF YOUR FIRE ESCAPES, YOU ARE LIABLE FOR THE
- COSTS OF FIGHTING THE FIRE AND ANY DAMAGE THE FIRE MAY CAUSE TO OTHERS.

WILLFULLY SETTING FIRES IS A FELONY AND PUNISHABLE BY FINE AND/OR IMPRISONMENT

(WEST VIRGINIA ARSON HOTLINE 1-800-233-FIRE)

SPONSORED BY: WV DIVISION OF FORESTRY

UNITED STATES FOREST SERVICE