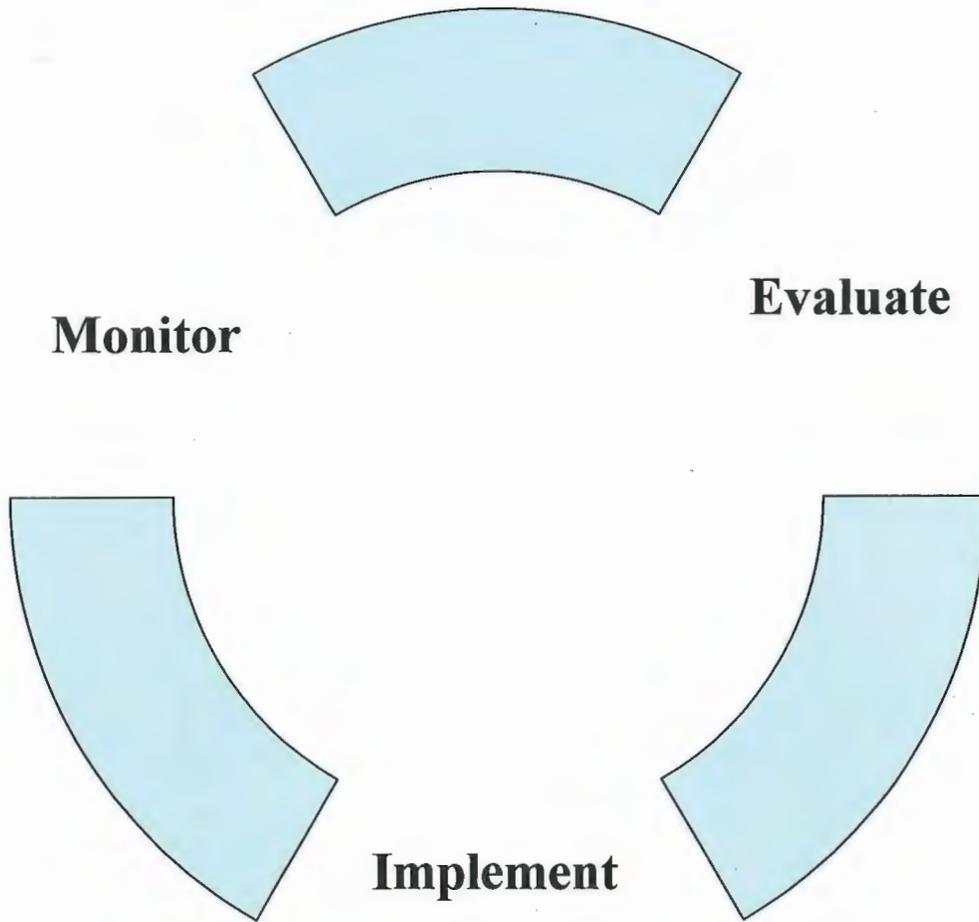


**Allegheny National Forest
Fiscal Year 2007
Monitoring and Evaluation Report**



ALLEGHENY NATIONAL FOREST
MONITORING AND EVALUATION REPORT
FISCAL YEAR 2007

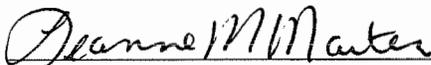
ABSTRACT

This report evaluates the results of monitoring the implementation of the Allegheny National Forest Land and Resource Management Plan for Fiscal Year 2007. It is the first Monitoring and Evaluation Report since 2001.

The objectives of monitoring and evaluating Forest Plan implementation are to determine how well management standards and guidelines have been applied, and to evaluate the effectiveness of management direction. This report displays monitored items by Minimum Legal Objectives (MLO), Forest Plan Objectives (FPO), and Strategic Monitoring Objectives (SMO). It also discusses the effects and effectiveness of Forest Plan management direction by resource program.

APPROVAL

I have reviewed and approve the Forest Plan Monitoring and Evaluation Report for FY 2007 that was prepared by the Allegheny National Forest Interdisciplinary Monitoring Team. I am satisfied that monitoring and evaluation efforts meet the intent of the Forest Plan (pages 38 to 52) and I agree with the conclusion that there is no need to amend the plan at this time.



LEANNE M. MARTEN

Forest Supervisor

Date: 7-17-08

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LIST OF ABBREVIATIONS

ASQ – allowable sale quantity
BA – Biological Assessment
BOF – Bureau of Forestry
CUA – concentrated use area
dbh – diameter at breast height
DCNR – Department of Conservation and Natural Resources
DEP – Department of Environmental Protection
FACTS – Forest Service Activity Tracking Summary
FEIS – Final Environmental Impact Statement
FHM – Forest Health Monitoring
FHP – Forest Health Protection
FIA – Forest Inventory Analysis
FPO – forest plan objective
FS – Forest Service
FY – fiscal year
HWA – Hemlock Woolly Adelgid
K-V – Knutsen-Vandenberg
MA – Management Area
MLO – minimum legal objective
MRC – management requirements and constraints
msl – mean sea level
NF – National Forest
NFS – National Forest System
NNIS – non-native invasive species
NRS – Northern Research Station
OGM – oil and gas management
p – page
pp – pages
Pa. – Pennsylvania
PDA – Pennsylvania Department of Agriculture
SMO – strategic monitoring objective
TIM – Timber Information Manager

Introduction to Monitoring

Monitoring and evaluation are separate, sequential activities required by the National Forest Management Act. Monitoring is the collection of data by observation or measurement. Evaluation is the analysis and interpretation of monitoring data. The purpose of monitoring and evaluation is to determine whether or not Forest Plan implementation activities comply with Forest Plan direction, and whether or not the application of Forest Plan standards and guidelines is meeting Forest Plan goals and objectives. The results of monitoring and evaluation can verify implementation activities or can ultimately lead to change in Forest Plan management direction.

2007 Transition to Land and Resource Management Plan Monitoring Plan

The revised 2007 Allegheny National Forest (NF) Land and Resource Management Plan (called Forest Plan in this document) went into effect on April 30, 2007. During the plan revision process, annual monitoring plans were not published. The last published annual monitoring plan was for Fiscal Year (FY) 2001. Many items tracked in the Annual Monitoring Plans from 1989 to 2001 were updated and used during the plan revision process as described in Appendix B of the Forest Plan, Description of the Analysis Process. The Forest Plan is organized as described below and we will follow this outline in monitoring to measure and evaluate our work.

Part 1 - Vision of the Forest Plan - Management of the Allegheny NF is guided by three broad Desired Condition Statements as described in our Forest Plan (pages (pp) 9 to 12):

- 1) Use of the Forest;
- 2) Ecosystem Conditions; and
- 3) Infrastructure.

These statements describe a future condition that is the long term goal of the Forest Plan. Activities conducted during implementation are to contribute to the achievement of this desired condition.

We also established goals and objectives (or aspirations) to guide management of the Forest's resources. Goals are generally written in broad general terms. Objectives are concise, usually time specific, statements of measurable planned results. In order to meet future conditions, the Forest was "zoned" into distinct management areas, each with a vision for a desired condition and an array of allowable activities compatible with the resource goals and the desired condition. Standards and guidelines -- the specific, technical direction for managing resources -- were established to protect natural resources and help obtain the intended outcomes.

Part 2 - Strategy of the Forest Plan - Identifies how the Allegheny NF will achieve the desired conditions with estimates of activities, outputs, and conditions. It contains the Monitoring Plan (pp 37 to 51) which describes what will be measured to determine how well we are moving towards predicted outcomes, protection of resources, and desired conditions of the land.

The Monitoring Plan has the following tables:

- #13 Minimum Legally Required Items (from 36 CFR 219);
- #14 Items to Measure Achievement of Forest Plan Objectives; and

#15 Items to Address Strategic Monitoring Information to be utilized for a five-year comprehensive evaluation of the Forest Plan.

Because we have completed only a partial year of monitoring, the Annual Monitoring and Evaluation Report contains conclusions and recommendations for only the items listed for annual evaluation in Tables 13, 14, & 15, and first year results may not be indicative of future results.

A Monitoring Guide was started, but not finished in 2007, to establish the protocols for each monitoring question. The Monitoring Guide is an open-ended document listing data sources, methodology, costs, timing, data storage location, and priority of each monitoring item. Not all of the protocols have been established for each monitoring item and not all of the items in the database are monitored annually. Some items are scheduled to be monitored less frequently and some are dependent on available funding. Each year, effective FY 2009, we will create a Monitoring Schedule that identifies and prioritizes the items to be monitored that year.

In addition to monitoring the items listed in the annual Monitoring Schedule, individual project monitoring occurs on a daily basis as employees administer work projects or contracts. Project monitoring helps insure that implementation is occurring as described in project plans and decisions. Most of this project monitoring is not formally compiled and reported in the Monitoring and Evaluation Report, but is invaluable in ensuring quality work on the ground. Project monitoring may not result in changes to the Forest Plan, but it can affirm our approaches or encourage timely adaptation in our management activities to protect resources.

The following sections contain the evaluation and monitoring results of 17 items for 2007, a list of monitoring items for future evaluation, and some other interesting monitoring completed in FY 2007. The items are organized as they appear in the Forest Plan to allow tracking and comparison by Table # and resource area. Each item lists the monitoring question, the **protocol**, **results**, and ends with **conclusions** and **recommendations**. A monitoring schedule for 2007 was not prepared, but a monitoring schedule for 2008 set priorities with available funding.

A Class value of A in the following tables under the column Precision/Reliability employs methods appropriate for modeling or quantitative measurement. Results have a high degree of repeatability, reliability, accuracy, and precision.

A Class value of B in the following tables under the column Precision/Reliability employs methods based on project records, personal communications, ocular estimates, informal visitor surveys, and similar types of assessments. Reliability, accuracy, and precision are lower than Class A methods, but the methods still provide valuable information.

17 Annual Evaluation Items for 2007 from Tables 13, 14, & 15 (use #'s in Monitoring Guide)

1. MLO #01 Stocking within Five Years of Regeneration Harvests

(Forest Plan, p 39) - from Table 13. Minimum Legally Required Monitoring Items.

Action, effect or resource to be managed	Monitoring Question	Monitoring Frequency	Evaluation Frequency	Precision/Reliability
Lands are adequately restocked within five years of regeneration harvest (36 CFR 219.12(k)5(i)) and (36 CFR 219.27 (c)(3))	Have lands been adequately restocked within five years of regeneration harvest?	Annual	Annual	A

Protocol – Stocking surveys were completed on the ground in each harvest area using Allegheny NF and Northern Research Station (NRS) stocking survey guidelines (Forest Plan, p 69, and Appendix A, p A-2). A Forest Plan reforestation standard (Forest Plan, p 69) calls for stocking surveys in all regeneration harvests to monitor tree seedling development and to determine the need for additional reforestation treatments.

Stocking surveys were conducted in many areas during the 2007 summer growing season when species and health of the vegetation were easiest to identify. Some data were stored in the Forest Service Activity Tracking System (FACTS) database and some were stored on paper. Monitoring was conducted by permanent or seasonal Forest employees or contractors. Forest district personnel summarized stocking survey results by type of harvest activity and year the harvest cut occurred.

Results - The following table lists the percent of acres stocked with adequate regeneration (tree seedlings) based on the most recent stocking survey conducted within five growing seasons of a stand's regeneration harvest treatment. Regeneration harvest includes final harvest (for even-aged management) or selection harvest (for uneven-aged management). Data are presented for both even-aged and uneven-aged silvicultural prescriptions, grouped according to "green" or "salvage" harvest. Green harvests are scheduled (non-salvage) treatments where Forest personnel generally had an opportunity to conduct reforestation activities on the site in order to establish tree seedlings in advance of the regeneration harvest. Salvage treatments are initiated in response to naturally occurring tree mortality, from agents like insects, diseases, or blowdown, where much of the reforestation activity occurs following the catastrophic event.

Even-aged prescriptions are designed to maintain either one or two major age classes of trees. If managed for two age classes, each class is usually separated by at least forty years. The older age class is usually much larger in diameter and is sparse enough to allow the younger trees to develop underneath.

Uneven-aged prescriptions are designed to maintain a wide range of age classes (three or more) over time. These prescriptions may include both group selection and single-tree selection treatments. The data in the table below were based on the standards and guidelines in the 1986 Forest Plan.

The first column lists the year an area received a regeneration harvest treatment. The second column lists the most recent year of stocking surveys that are included in this summary. The type of treatment is broken down first into Even-aged or Uneven-aged. Even-aged is further broken down into Green, Mortality Salvage, or Blowdown Salvage. Mortality salvage results primarily from insects and diseases, whereas blowdown salvage results from wind events. Even-aged Green and Even-aged Mortality Salvage are further separated into Final Harvest (one age or two ages). "Mortality Salvage Final Harvest" includes areas where a salvage shelterwood removal cut occurred as well as areas where both a salvage shelterwood seed cut and a salvage shelterwood removal cut occurred. Uneven-aged treatments are broken down into Green or Mortality Salvage.

Table 1. Percent of Acres Stocked within Five Years of Regeneration Harvest Cutting

Cut Year	5th Year Survey Year	Even-aged Prescription					Uneven-aged Prescription	
		Green		Mortality Salvage		Blowdown Salvage	Green	Mortality Salvage
		Final Harvest	2 age	Final Harvest	2 age	all	all	all
1986	1991	94.8%				74.1%		
1987	1992	87.2%				87.0%		
*1988	1993	92.3%				92.6%		
1989	1994	85.5%		89.1%			61.5%	
1990	1995	75.2%		81.0%			0.0%	
*1991	1996	85.5%		84.4%			8.9%	
1992	1997	81.7%		100.0%			6.9%	
1993	1998	86.6%	100.0%				60.2%	
1994	1999	77.1%				100.0%	64.5%	
*1995	2000	79.8%	0.0%				36.5%	
1996	2001	85.8%	23.7%	96.2%	54.5%	41.3%	12.0%	
1997	2002	79.2%	72.0%	91.8%	9.1%	42.5%	16.2%	0.0%
1998	2003	91.0%	69.5%	100.0%	53.8%	100.0%	5.0%	0.0%
*1999	2004	92.8%	0.0%	16.8%	100.0%		59.3%	
2000	2005	88.6%					0.0%	
*2001	2006	95.0%		100.0%			7.5%	
2002	2007	88.1%		26.7%	100.0%		0.0%	
Total Cut Acres 1986-2002		21,700	422	1567	501	4711	4479	50
Weighted Average Fifth-Year Restocking Percent		85.4%	52.4%	83.0%	41.3%	79.2%	31.6%	0.0%

*Drought Years - when the Palmer Drought Severity Index was less than -1 throughout the growing season.

Conclusion – Reforestation success within five years of green, even-aged (single-age) regeneration harvests (considering harvests completed between 1986 and 2002) ranges from 75.2% (1990 harvests) to 95.0% (2001 harvests). Where the fifth year survey is 2007 (cut in 2002), the success rate is slightly over 88%, a decrease from the 95% reported the previous year.

Years of reduced success rates seem to follow (within several years) years where drought conditions existed during the growing season, or where substantial insect defoliation occurred (as is the case for the first half of the 1990s). For harvests since 1998, tree seedling stocking success at the end of five years has ranged from 88% to 95%.

Reforestation success for even-aged, two-aged regeneration harvests is close to, or somewhat below, 50% for both green and salvage treatments. This is much lower than even-aged (single-age) harvests.

Mortality and blowdown regeneration harvests reflect wider yearly fluctuations in five year success rates, most likely because seedlings were not in place before the catastrophic events occurred. The highest success rate is for even-aged, single-age salvage. In all cases, reforestation success rates are fairly good considering these harvests are a response to a natural catastrophic event, and Forest personnel did not have an opportunity to complete reforestation treatments while an adequate seed source existed before the event occurred. Significantly fewer acres of salvage harvest occur than of green harvest; the 1986-2002 salvage harvest program was approximately 30% of the size of the green harvest program.

The tree seedling success rate for uneven-aged treatments is low, but most of these treatments occurred during higher deer populations and without the benefit of enhancements included in the Forest Plan.

Recommendations – No changes are recommended at this time. Continue to use Forest personnel and contractors to monitor tree seedling development success and the need for additional reforestation treatments to assure timely and adequate tree seedling stocking in regeneration harvests.

Since uneven-aged treatment success rates are substantially less than desired (though treatment results represented in the table above are based on implementing the 1986 Forest Plan and a generally higher deer population), continue to implement uneven-aged treatments through an adaptive management approach, taking into account the new direction noted in the Forest Plan (Forest Plan, pp 64 to 66, 68 & 69; Appendix A, pp A-2, A-4 to A-19, A-23 to A-28). Effective evaluation of the Forest Plan uneven-aged management guidelines could take five to ten years in order to provide enough time for harvest, follow-up reforestation treatments, and development of tree seedlings.

2. MLO #04 Destructive Insects and Diseases, and Effects

(Forest Plan, p 39) – from Table 13. Minimum Legally Required Monitoring Items.

Action, effect or resource to be managed	Monitoring Question	Monitoring Frequency	Evaluation Frequency	Precision/Reliability
Ensure destructive insects and diseases do not increase to potentially damaging levels following management activities (36 CFR 219.12(k)5(iv))	Have destructive insects and diseases increased to potentially damaging levels after management activities?	Annual	Annual	B

Protocol - The following specific types of forest health monitoring occurred in FY 2007, or in some cases since the Allegheny NF last reported on the status of insects and diseases (FY 2001

Monitoring and Evaluation Report, pp 43-55; 2007 Forest Plan Final Environmental Impact Statement (FEIS), pp 3-78 to 3-105):

- Informal observations made by Forest field-going personnel;
- Forest Health Management (FHM)/Forest Inventory Analysis (FIA) forested land plot data collection from FY 1998 to FY 2001 with re-measurement data collected FY 2002 to 2006;
- Formal analysis of FHM/FIA FY 1998 – 2001 plot data (Morin, et al, 2006);
- Summer aerial detection surveys by Forest Health Protection (FHP), Pennsylvania (Pa.) Bureau of Forestry (BOF), and Forest personnel;
- Field surveys conducted by FHP entomologists and pathologists, and Forest personnel; and
- Observations by Pa. Department of Agriculture (PDA) and USDA-APHIS personnel.

Additional information on exotic forest pest species and their status nationwide can be found at www.aphis.usda.gov. The USDA-Forest Service (FS) Northeastern Area website (www.na.fs.fed.us) provides additional information regarding the current status of both native and exotic forest pests in the Northeastern United States.

Monitoring was conducted to assess the overall health of the Forest vegetated with trees and the status of a wide variety of insects and diseases that have been impacting the Forest during the last 20 years. Monitoring included data collected in the field, aerial detection, and general observations by experienced field personnel. Most of the data collected or the observations made were during the FY 2007 growing season (or in the case of the FHM/FIA data, within the 1998-2001 growing season). Data collection adhered to standard agency protocol or FHM/FIA protocol, and data were stored in agency data bases or as informal field notes.

A variety of personnel from the Forest, FHP in Morgantown, WV, Pa. BOF, and New York Department of Environmental Conservation monitored forest health within the Forest and surrounding geographic areas of Pennsylvania and New York.

Results – The following provides an update to previous forest-wide discussion of forest health that was published in the Forest Plan (pp 3-78 to 3-105) and in the FY 2001 Monitoring and Evaluation Report (pp 38 to 55). Substantial detailed background information, organized by individually named insect, disease, or category of threat to forest health, can be found in these referenced documents. The following discussion is by exception; topics discussed here will include only those where there is new information to report. The information reported below applies to the Forest, both to areas that have had management activity as well as to those areas that have had little or no activity, unless otherwise noted. If references pertain to areas outside of the Forest, it will be noted as such.

Native insects and diseases

While native insects and diseases (cherry scallop shell moth, forest tent caterpillar, pine budworm, oak leaf tier, and elm spanworm) have caused substantial defoliation during the past 20 years on the Forest, and throughout Pennsylvania, they have caused little measurable defoliation since the summarization in the FY 2001 Monitoring and Evaluation Report (Allegheny NF 2004, pp 45 to 53). However, one of these insects (forest tent caterpillar) has reached outbreak levels elsewhere in Pennsylvania during the past few years (in the northern tier counties of Pennsylvania east of the Allegheny NF), indicating the possibility that it may again impact the Allegheny NF within the next few years unless natural population controls prevail. Historically, cherry scallop shell moth has caused substantial defoliation approximately every ten

years (the last substantial defoliation occurred in 1996), indicating the distinct possibility of an outbreak in the near future if historical patterns persist.

Deer herbivory/interfering plants

The Forest Plan (Allegheny NF 2007, pp 3-93 to 3-95) discusses how excessive deer browsing and interfering plants have severely limited tree seedling development and growth on the Allegheny Plateau; healthy young trees are not present in many areas to replace trees that die, interrupting the natural cycle which normally maintains continuous forest cover on the landscape. Significant investments are required in order to establish tree seedlings and successfully reforest the land.

Deer browsing is now lower in intensity than the previous seventy years. Deer populations have decreased from a forest-wide average of 27 deer per square mile in 2002 to 12 deer per square mile in 2007, though certain areas of the Forest continue to experience much higher levels of deer impact. However, even if deer impacts remain at reduced levels, increased investments in fencing and herbicide will still be necessary to:

- reduce interfering understory plants that are well-established from the past 70-year legacy of deer browsing;
- regenerate certain tree species highly preferred by deer; or
- reduce deer numbers in specific areas that have higher deer populations.

Tree seedling stocking is substantially higher in areas that have had regeneration harvest and reforestation activity than in areas that have not had these types of treatments.

Exotic insects

Gypsy moth (Lymantria dispar L.) - This insect was introduced into the United States from France in 1869 (Forest Plan FEIS, pp 3-96 & 3-97). While gypsy moth defoliation increased in central and eastern Pennsylvania in 2007 (681,435 acres of moderate to severe tree defoliation) (2007 Pa. Annual Pest Conditions Report, p 5), no defoliation was detected on the Allegheny NF. With the exception of a very small amount of light defoliation in 1999, no measurable gypsy moth defoliation has been detected on the Forest since 1993. Dry spring conditions throughout those infested areas in Pennsylvania are believed to have limited the activity of fungal and viral population controls, whereas moister spring conditions favoring these population controls existed on the Allegheny NF. Forest personnel expect little measurable gypsy moth defoliation in 2008.

Aerial suppression activity occurred on 64,515 acres in central and eastern Pennsylvania in 2007, but no treatment occurred within or near the Allegheny NF. There has been no gypsy moth aerial control on the Allegheny NF since 1994.

Pear thrips (Taeniothrips inconsequens (Uzel)) - Since the two recent cycles of significant pear thrips' damage on the Allegheny NF (1989 and 1993), they have caused little damage to its primary host trees, sugar maple and black cherry. In 2007, pear thrips damaged 122 acres of sugar maple in four north central Pennsylvania counties, including McKean County (Pa. BOF 2007, p 8).

Asian longhorned beetle (Anoplophora glabripennis) – This beetle has not been eradicated from the United States, but there is no new information to report that is of significance to the Allegheny NF.

Emerald ash borer Agrilus planipennis) - Emerald ash borer (EAB) is an exotic beetle (Forest Plan FEIS, p 3-104) native to Asia (China, Japan, Korea, Mongolia, and the Russian Far East) that attacks all species of ash trees. Since its detection in 2002 in Detroit, Michigan, it has also been found in Ohio, Indiana, Illinois, Maryland, West Virginia, and Ontario, Canada. In 2007, it was detected for the first time in Pennsylvania. Since 2002, it has caused the mortality of an estimated 25 million ash trees.

On June 22, 2007, two emerald ash borer adults were collected by APHIS surveyors working north of Pittsburgh in Cranberry Township, Butler County, Pa. Since then, EAB has been found in six townships in Butler and Allegheny counties. PDA has imposed two quarantines as a result of this detection of EAB and previous detection of other invasive, wood inhabiting insects that threaten forest health.

- The first quarantine prohibits movement of ash materials (including nursery stock, green lumber, logs, stumps, roots, and branches) from the quarantined area (Butler, Beaver, Lawrence, and Allegheny counties) to other areas. All hardwood chips, bark, and firewood of any species are also quarantined for these products since it is difficult to distinguish between tree species.
- The second quarantine prohibits moving all types and species of firewood into Pennsylvania from other states, (except for kiln-dried, packaged firewood clearly labeled as such, or USDA certified firewood).

Through the spring of 2007, Forest personnel conducted public education and outreach about the threat to forestland from exotic pests, such as EAB, and encouraged people to limit the amount of firewood they bring to the Forest, particularly from locations known to be impacted by exotic pests. In October 2006, FHP personnel conducted an EAB detection survey of seven recreation sites on the Forest. No emerald ash borers were detected.

In July 2007, in response to the EAB found in Pennsylvania, Forest personnel increased EAB management activities. The Forest Supervisor issued an order restricting the transport of firewood into the Allegheny NF from any location outside of Elk, Warren, Forest, or McKean Counties in Pa. In addition, Forest personnel increased the EAB public education and awareness program by:

- issuing news releases and special interest stories;
- adding information to the Forest website;
- mailing EAB educational material to nearly 12,000 private landowners within the four-county area (with permanent residences in 27 states);
- alerting people who are making campground reservations; and
- adding an EAB-related message to the Forest telephone information.

Allegheny NF personnel made a concerted effort to “contain” and inspect firewood inadvertently brought from restricted areas into Forest camping areas. The following summarizes data collected regarding the geographic source of firewood brought to developed campground sites in 2007:

- No emerald ash borer (adults or larvae) was detected.
- Eighty-one percent of firewood inspected did not contain ash.
- The following summarizes the firewood point of origin:
 1. 49 percent of the firewood originated from within Pennsylvania, from counties not under PDA quarantine;

2. 23 percent came from the four counties under a PDA quarantine;
3. 19 percent came from Ohio;
4. nine percent came from other states; and
5. two percent came from within the Allegheny NF four-county area.

The firewood order remains in effect for 2008, and planning is underway for additional EAB education, awareness, and survey programs (including detection surveys in or near high-use recreation areas where ash trees exist). Beginning in mid-May, the PDA will begin installing 13,000 purple detection traps on a 1.5 square mile grid throughout Pennsylvania, including the Allegheny NF. State personnel are also stepping-up public education and outreach efforts within Pennsylvania.

Hemlock Woolly Adelgid (Adelges tsugae) - Hemlock woolly adelgid (HWA) is a non-native insect native to Asia that has the potential to cause substantial hemlock mortality or decline during the next five to fifteen years (Forest Plan FEIS, pp 3-103 & 3-104). Significant tree mortality normally occurs within four to seven years after infestation, threatening the unique and valuable ecosystem hemlock provides. First detected in the United States in 1924 in the Pacific Northwest, the adelgid was introduced into the Eastern United States from Asia in the early 1950's near Richmond, Virginia, on some exotic tree species that a private collector planted in his arboretum. First detected in southeastern Pennsylvania in the late 1960's, it now can be found in 49 out of 67 counties in Pennsylvania. In 2005, HWA was detected in Elk County approximately 25 miles from the Forest boundary.

Since 2004, Forest personnel have annually surveyed 48 to 104 hemlock stands and, to date, they have not detected any HWA. Detection surveys will continue in 2008.

In 2007, Pa. Department of Conservation and Natural Resources (DCNR) personnel continued efforts (outside of the Forest) to establish predatory beetles for biocontrol, surveillance, and continued some chemical suppression of HWA. The chemical control included soil or stem injections on high value hemlock sites. Analysis of hemlocks chemically treated in 2005 indicated reduced HWA infestation, increased new growth, and fewer dead tips relative to controls. Additional predatory beetle releases are planned for 2008 (2007 Pa. Annual Pest Conditions Report, pp 1 to 3).

The Allegheny NF is participating in a research study designed to address the question of whether thinning mixed hemlock-hardwood stands to increase the vigor of hemlock trees prior to the arrival of HWA will increase the survivability of hemlock when HWA attacks the stand. This project is a joint effort with the USDA-FS, NRS (Morgantown, WV) and USDA-FS Northeastern Area State and Private Forestry (Morgantown, WV). Thinning treatments were completed in 2007.

Sirex woodwasp (Sirex noctilio) - This non-native woodwasp of Eurasian origin (Europe, Asia, and northern Africa) was discovered in New York State in 2004 and in north central Pennsylvania (Tioga and Bradford counties) in 2006. *Sirex woodwasp* has caused severe economic damage in other countries where it has been introduced. It now has been detected in numerous counties in northern, central, and western New York, and in 2007 it was detected in Erie, Elk, McKean, and Monroe Counties in Pennsylvania. The McKean County detection site was near Scots pine trees in an abandoned Christmas tree plantation east of Kane, Pa., where both adult and larvae were found.

Typically, *Sirex noctilio* attacks suppressed, or otherwise weakened, pine trees. Pine areas characterized by overstocked conditions, containing overtopped/damaged trees, or growing on poor sites are likely areas where tree mortality caused by *Sirex noctilio* could occur. In New York, the insect has been found colonizing Scots, red, and white pines. In the Southern Hemisphere where it has also been inadvertently introduced, it has caused up to 80% tree mortality in exotic pine plantations, most of which are planted with North American pine species. In other countries, *Sirex* woodwasp has been successfully managed using biological control agents, such as a parasitic nematode and hymenopteran parasitoids.

Native tree diseases

There is no new information to report.

Exotic tree diseases

Sudden oak death - There is no new information to report.

Chestnut blight – There is no new information to report.

Butternut canker – Butternut is on the Regional Forester’s Sensitive Species List, and it is listed as “sensitive” for the Forest. Across its range in the central and eastern United States, butternut is declining due to a butternut canker disease (*Scirococcus clavigignenti-juglandacearum*), an exotic pathogen that was first detected killing butternut in the United States in 1967. In some places, populations have decreased over 75 percent between 1980 and 1994 (Ostry et al., 1994). Once a tree is infected, there is no known cure for this fungal disease (canker). There is good evidence, however, some resistant butternut trees are growing among severely diseased trees, and these trees need to be conserved for future research, tree breeding, and restoration.

In 2007, a Forest Service special project provided funds to locate, document with a Global Positioning System, and assess the health of as many butternut trees as possible in and near the Allegheny NF. Prior to the beginning of this butternut search, approximately 80 individual butternut trees were suspected to exist within the Forest. Through this search, a total of 254 butternut trees were located; 95 (37%) were canker free on the main bole. Most of these trees had no crown dieback. A number of these trees were being negatively impacted by vines or competition from adjacent large trees. Butternut is a very shade intolerant species, and it requires abundant sunlight to thrive. The potential exists to establish a Forest seed orchard using twig cuttings (scions) from 57 of these trees that meet the requirements as a candidate for scion collection.

Beech bark disease complex – Beech bark disease complex is an exotic insect/disease complex that is causing substantial beech mortality on the Allegheny NF and in the eastern United States (Forest Plan FEIS, pp 3-97 to 3-99). The scale insect was first detected on the Forest in the early 1980s, and is now present throughout the entire Forest. In 2003, the killing front covered 42 percent of the Forest; it continues to expand southwest through the Marienville District.

Significant beech mortality continues to occur, as was described in the Forest Plan FEIS (Allegheny NF 2007, p 3-98). Additional information on beech tree mortality for old growth conditions can be found below in the subsection below entitled “*Tree mortality/decline in the Tionesta Research Natural Area*”.

Forest Plan guidelines provide for retaining those beech trees that have characteristics indicating they may be resistant to the beech bark disease complex (Forest Plan, p 94). Forest personnel are participating in a joint research project designed to test whether additional growing space created

by removing or killing susceptible beech trees and beech sprouts creates sufficient growing space around resistant stems to give resistant root sprouts an advantage, thereby increasing the resistant beech composition in the young forest that develops. Shelterwood harvest and herbicide treatments have been completed in these areas, and tree regeneration monitoring is in progress. A few of the resistant trees are scheduled for scion collection in 2008, with the long term objective of developing a seed orchard that consists of genetic material from these potentially resistant trees. This project is a joint effort with the USDA-FS, NRS (Morgantown, WV, and Delaware, OH) and USDA-FS Northeastern Area State and Private Forestry (Morgantown, WV).

Climate/Environmental Factors

Drought - Precipitation is normally plentiful throughout the year, averaging 40 to 45 inches per year. Between 1972 and 1987, the Forest experienced a relatively drought-free period, however significant droughts occurred in 1988, 1991, 1995, 1999, and 2001 based on the Palmer Drought Severity Index (PDSI less than or equal to -1, predominantly during the growing season). Between 2002 and 2007, rainfall has been close to, or above, historical normal conditions. Drought can be an important contributor to forest decline or tree mortality, particularly when it occurs during successive years, or when it is concurrent with, closely precedes, or closely follows periods of substantial tree defoliation or some other environmental or biological factor that significantly stresses the trees.

Ozone - Survey data was collected from 2002 through 2007, but analysis and summary of the data is in progress.

Site/Species nutrient capability - There is no new information to report.

Atmospheric deposition - There is no new information to report.

Wind events - No significant wind events have occurred on the since the 2003 windstorm mentioned in the Forest Plan FEIS (p 3-79).

Ice storms - There is no new information to report.

Tree mortality/decline

Morin, et al. (2006) reported the results of the analysis of Allegheny NF Forest Health Monitoring plot data collected between 1998 and 2001. The Forest Plan FEIS contains a summary of the results of that analysis (Allegheny NF 2007, pp 3-102 & 3-103).

FIA/FHM data collected between 2002 and 2006 - FIA/FHM plots measured between 1998 and 2001 were remeasured from 2002 to 2006. Analysis of the data has begun. A primary objective of the analysis is to assess any changes in forest health that may have occurred since the initial measurement. Results of this analysis will be reported as soon as they are available.

Tree mortality/decline in the Tionesta Research Natural Area - In 2007, personnel conducted a special Forest Health Evaluation Monitoring Project in the TRNA. Fifty plots, installed in 1979, were re-measured to determine the impact of beech bark disease complex on unmanaged, old growth beech-hemlock forest type, as an indicator of the potential long term outcome of management that promotes development of a northern hardwood forest type dominated by beech and hemlock (pre-European settlement conditions). The TRNA (2,080 acres, together with the adjoining 1,894 acre Tionesta National Scenic Area) represents one of the few remaining old growth remnants of this forest type in the United States. Overstory species composition consists roughly of 40% American beech, 40% eastern hemlock, and 20% other tree species. HWA, an

exotic insect known to cause high rates of tree mortality in Eastern hemlock, has been found about 50 miles away from the TRNA.

A quick visual review of the 2007 data collected there indicates that close to 80% of the beech has died (most of it since 2002), and half of the remaining live beech is significantly declining (has less than 50% of its normal live crown). Therefore, only 10% of the overstory beech component that existed in 1979 is still alive and healthy. A more thorough analysis of the plot data is in progress.

Conclusion – With the exception of beech bark disease complex, insect and disease activity has been well below the outbreak levels last observed in 1996. In fact little defoliation activity has been detected. Though droughts did occur in 1999 and 2001, they were less significant than the three that occurred during the previous ten year period when heavy tree defoliation occurred either concurrent with, or within a year or two of, drought. Though some trees and sites still show significant effects of those repeated stresses (prompting the need for silvicultural treatments), others are on the way to recovery.

Recommendations - Continue insect and disease detection and monitoring activity as a cooperative effort with USDA-FS, FHP.

Continue to collect and use FIA/FHM intensified forest health monitoring data to assess the health of individual tree species and complex forest ecosystems on the Allegheny NF (and compare them with the surrounding region). This is particularly important when new exotic pests invade the Forest or outbreaks of native pests occur.

For those insects and diseases that present new threats to Forest tree species, continue to assess the need for public education, control of the movement of forest products, and implementation of newly identified or state of the art pest control techniques.

3. MLO #20 Comparison of Projected and Actual Outputs and Services

(Forest Plan, p 41) - from Table 13. Minimum Legally Required Monitoring Items.

Action, effect or resource to be managed	Monitoring Question	Monitoring Frequency	Evaluation Frequency	Precision/Reliability
Comparison of projected and actual outputs and services (36CFR 219.12(k)(1))	How do actual outputs and services compare to those projected?	Annual	Annual	A

Protocol - A listing of the major outputs and services projected under the Forest Plan are found in Part 2-Strategy under the section Estimated Forest Activities in Tables 2, 3, & 4 on pages 21 to 24. These projections assumed full funding and contain estimates by decade 1 (up to 2017) and decade 2 (up to 2027). To facilitate a quick comparison on the progress toward these activity levels [in FY 2007, roughly 60% of the year was under 1986 Forest Plan direction and 40% of the year was under 2007 Forest Plan direction], the tables below display the same activities by resource area with an annual average amount projected in the 1st decade column and the FY 2007 level amount accomplished in the second column.

Since most of these activities tie directly to Forest Plan Objectives (FPO), a reference to Table 14 - Achievement of Forest Plan Objectives (Forest Plan, p 42) is included by management activity. The reference number FPO-# is a crosswalk to the Forest Plan Monitoring Guide –

where each monitoring item has been numbered, and protocols drafted for those items currently being collected. Also included is the fiscal year when that monitoring objective question will be evaluated. The Monitoring Guide is a dynamic document and will be updated as necessary to provide overall guidance to the annual monitoring program.

The activities shown in Tables 2 and 3 (Forest Plan, pp 21 to 23) are not plan decisions and should not be confused with plan objectives. These estimates are neither minimums nor limitations. They are the result of prescriptions applied in the SPECTRUM model or amounts projected by Allegheny NF resource specialists for Alternative Cm (the selected alternative) that move the current conditions toward the desired future conditions described in the Forest Plan. The actual treatment level for FY 2007 reflects the rate of movement toward the desired conditions. Budgets are a key factor influencing accomplishment levels and rate of movement towards desired conditions. For some new activities it may take several years for site-specific project planning to be completed and then build up toward the level of activity projected in the ASQ in Table 4 (Forest Plan, p 24) is a Plan Decision and represents the maximum amount of timber that can be harvested from the Allegheny NF on lands that have been determined to be suitable for timber production. Although the ASQ is identified as an annual average quantity for each decade of the plan, the amount produced in any one year may be either below or above the identified ASQ as long as the totals for the decade are not exceeded.

Results - A narrative for each resource area follows the table. An evaluation of these activities is scheduled for the FPO they are associated with, and listed in the table. If the objective was scheduled for an annual evaluation, a reference to the evaluation number is shown and can be found in this report.

Description of Recreation Accomplishments in FY 2007

Table 2: Comparison of Projected Recreation Activities (Forest Plan, p 21)

Management Activity	Average Annual Decade One	FY 2007 Actual Accomplishment
Recreation Activities		
Motorized Trail Construction (Miles) FPO-05 evaluate 2012	4	0
Non-motorized Trail Construction (Miles) FPO-05 evaluate 2012	5	8
Dispersed Site Enhancement in CUAs+ (each) FPO-04 evaluate 2010	1	0
Construction/Reconstruction of Developed Facilities (each) contributes to FP Recreation Goals	2	3
Wilderness Areas Managed to Standard (each) FPO-10 evaluate 2012	2*	0

FPO is Forest Plan Objectives

+CUA is Concentrated Use Area

**The Allegheny only contains two congressionally designated wilderness areas that are subject to this management activity. An errata needs to be published correcting this number from 4 to 2 on page 21 in the Forest Plan.*

Motorized Trail Construction

There was no new construction on the motorized trail system (either All-Terrain Vehicle/Off-Highway Motorcycle or snowmobile) in FY 2007.

Non-Motorized Trail Construction

The Wolf Run Marina Access Trail (900 feet) was constructed in FY 2007. This trail provides access to the new fishing piers that were also constructed in FY 2007 (see *Construction/Reconstruction of Developed Facilities* below).

Eight miles of trail construction also occurred on the Spring Creek Equestrian Trail. Construction occurred on the Kelly Pine Loop (seven miles) and in the Pigeon Creek drainage (one mile). These projects were completed through partnership work with volunteers from the Pennsylvania Equine Council and involved improving drainage, surfacing, and clearing in areas used by equestrians.

Dispersed Site Enhancement in Concentrated Use Areas (CUA)

The Clarion River corridor has been a popular place for dispersed recreation for many years. In recent years, resource damage from unmanaged user created campsites has increased. As a result, the Forest started Phase I of the Clarion River Dispersed Recreation Project in 2006. Phase I included a Categorical Exclusion decision document which identified the need to regulate dispersed camping at user-created campsites along Clarion River and Millstone Creek. The primary purpose of Phase I was to designate some sites as appropriate for camping and/or day-use, and close other sites due to resource concerns. A total of 23 sites were designated for recreational/camping activities, two sites were identified for conversion to day-use parking areas, and 21 sites were identified for closure. No on-the-ground enhancements to designated sites were authorized under Phase I. Work should soon begin in the areas to close.

Construction/Reconstruction of Developed Facilities

This activity contributes to the Forest Plan Recreation Goals as described on page 13 of the Forest Plan. Construction of two new fishing piers was completed at Wolf Run Marina. A new trailhead for the Hickory Creek Wilderness was also constructed for the Hickory Creek Trail.

Wilderness Areas Managed to Standard

In order to meet this goal, the FS initiated a national 10 Year Wilderness Stewardship Challenge (WSC) in 2005. The FS has developed both national and regional strategies to accomplish this task. A wilderness is considered to be managed to standard when a minimum stewardship level has been achieved. The WSC defines a minimum stewardship level as achieving a cumulative accomplishment level score of 60 or greater on the following 10 elements:

- 1) Direction exists in the Forest Plan, or subsequent planning document that updated or amended the Forest Plan, which addresses the natural role of fire in wilderness and considers the full range of management responses.
- 2) The wilderness was successfully treated for non-native, invasive plants.
- 3) Monitoring of wilderness air quality values is conducted and a baseline is established for the wilderness.
- 4) Priority actions identified in a wilderness education plan are implemented.
- 5) The wilderness has adequate direction, monitoring, and management programs to protect opportunities for solitude or primitive and unconfined recreation.
- 6) The wilderness has a completed recreation site inventory.

- 7) Existing operating plans for outfitters & guides direct outfitters to use appropriate wilderness practices and incorporate appreciation for wilderness values in their interaction with clients and others. Assessments of needs for existing or new outfitter programs and operations are completed.
- 8) The wilderness has adequate direction in the Forest Plan to prevent degradation of the wilderness resource.
- 9) The priority information needs for the wilderness have been addressed through field data collection, storage, and analysis.
- 10) The wilderness has a baseline workforce in place.

In 2007, the Hickory Creek Wilderness accomplishment level score was 42 points (as reported in INFRA and elements 5, 6, 7, and 9 were met. The Allegheny Islands Wilderness reached a score of 46 points, and elements 5, 6, 7, 8, and 9 were met. The Forest Service uses INFRA as an integrated data management tool to manage and report accurate information and associated financial data on the inventory of constructed features, such as buildings, dams, bridges, water systems, roads, trails, developed recreation sites, range improvements, administrative sites, heritage sites, general forest areas, and wilderness.

The 10 elements identified in the “Challenge” are not to be regarded as a checklist or a card to be punched. Attainment of each element is a stepping-stone to ensure that each wilderness retains its untamed spirit into the future. Each year monitoring requirements and estimated costs for meeting the Challenge will change. Elements may also evolve over time as necessary to meet the intent of the mandate.

Description of Prescribed Burning Activities in FY 2007

Table 3. Comparison of Projected Burning Activities (Forest Plan, p 22)

Management Activity	Average Annual Decade One	FY 2007 Actual Accomplishment
Prescribed Burning by Resource Objective (Acres) FPO-19 evaluate 2012		
Silviculture/Reforestation	104	0
Wildlife	300	0
Hazardous Fuels Reduction	250	4

The Forest Plan provides for the use of prescribed fire in fire adapted ecosystems to improve the successfulness of regenerating certain species. Prescribed fire for silviculture or reforestation purposes is most applicable in oak types, but it may also occur to prepare seedbeds for white pine, aspen, or hemlock regeneration, though on a limited basis. No silviculture/reforestation burning occurred in 2007, primarily due to a lack of recent silvicultural activities in oak types.

No prescribed burning for wildlife habitat improvement occurred in 2007 due to unfavorable burning conditions.

A pool of prescribed fire projects for hazardous fuels reduction is being developed in order to secure funding on a consistent basis. One hazardous fuel reduction project was completed by burning red pine slash from a salvage blowdown sale on the Kane Experimental Forest.

Description of Reforestation Activities in FY 2007

Table 4. Comparison of Projected Reforestation Activities (Forest Plan, p 22)

Management Activity	Average Annual Decade One	FY 2007 Actual Accomplishment
Reforestation Activities (Acres)		
Scarification for Oak FPO-22 evaluate 2012	104	0
Release for Species Diversity FPO-18 evaluate 2012	1,727	773
Site Preparation FPO-45 see evaluation item #13 below	1,992	1,534
Pre-commercial Thinning FPO-18 evaluate 2012	80	0
Fencing FPO-45 see evaluation item #13 below	1,701	69
Fertilization Contributes to FP vegetation goals	215	145
Herbicide Treatment for reforestation (excludes 208 acres of respray) FPO-45; see evaluation item #13 below	2,368	712

Scarification for Oak - Soil scarification is a site preparation technique designed to expose bare mineral soil to enhance the regeneration and establishment of seedlings. It is particularly applicable in oak stands when acorns are dropping to the forest floor in the fall, and has been shown to increase germination and survival of various oak species. As little management occurred in oak types during 2007, no scarification occurred.

Release for Species Diversity - Release treatment involves the non-commercial, manual cutting of tall-growing woody vegetation (generally of seedling or sapling size) interfering with growth and survival of tree seedlings or saplings desired on the site. Release follows the final regeneration cut. Release promotes growth and survival of species not common on the site (such as aspen, oak, ash, and cucumber) which are at risk of being killed by species that out-grow them, potentially increasing long-term species richness on the site. The number of acres receiving release treatments is lower than that projected in the Forest Plan, primarily because less final harvesting occurred in the past five years than projected in the Forest Plan.

Site Preparation - This treatment involves the non-commercial, manual cutting of woody stems that would interfere with the development of a diversity of seedlings. It involves the cutting of mid-story beech, striped maple, birch, red maple, or other selected woody species in order to reduce shading and promote development of tree seedlings. The acreage treated with site preparation to develop seedlings is somewhat lower than that projected in the Forest Plan. This

is likely because shelterwood seed cut and even-aged regeneration acres are lower than those projected in the Forest Plan.

Pre-commercial Thinning - Pre-commercial thinning removes trees in a stand that are not old enough for a commercial treatment. Trees are left on site where they are felled. The objectives of the treatment are to control species composition, maintain stand diversity, improve stand quality, and to increase growth rates on preferred trees. No areas were pre-commercially thinned in 2007.

Fencing - Where deer browsing impacts are high, area fencing is used to exclude deer and reduce the amount of browsing. Area fencing (8-foot tall, woven-wire fence) reduces deer browsing to a level that does not adversely affect most tree seedlings, shrubs, or herbaceous vegetation. A more diverse, dense layer of seedlings, shrubs, and herbaceous vegetation develops inside the fenced area if adequate light exists and there are few interfering plants.

Personnel closely monitor the need to use area fencing to reduce deer browsing impacts, and decide to fence areas only after it has been determined deer browsing impacts are causing insufficient seedling numbers or species to develop on specific sites of the Forest. Deer browsing impacts have dropped in recent years, as overall deer populations have been reduced. As a result, the need to fence has declined markedly, as reflected by 69 acres of fencing in 2007, compared to the projected 1,700 acres of fencing in the Forest Plan.

Fertilization - This treatment contributes towards Forest Plan goals and is used to accelerate growth of natural seedling regeneration. Fertilization of recently regenerated Allegheny Hardwood stands has proven successful in prompting seedlings to grow rapidly above the reach of deer. This treatment generally is used only after the final harvest cut is complete, and normally only on unfenced stands that are more susceptible to deer browsing. In response to new science, fertilizer use on plateau and upper sideslope sites will be reduced, with the goal of minimizing loss of soil base cations (Forest Plan, p 71). The acreage treated with fertilizer in 2007 to promote rapid seedling growth is lower than that projected in the Forest Plan. This is most likely because of the deer herd decline in certain areas, and the topographic position of final harvest areas.

Herbicide Treatment for Reforestation - Herbicide treatment is an important reforestation tool that has been used operationally since 1987 for both even-aged and uneven-aged management. Due to a legacy of selective deer browsing impacts, tree seedlings have been drastically reduced or eliminated on many sites. Since fern, striped maple, and beech are not preferred deer food, they often survive and dominate the understory, preventing a diversity of tree seedlings from becoming established. Though recent reductions in deer populations have been observed, interfering vegetation is already established and still needs treatment so adequate tree seedlings can become established. Formulations used on the Allegheny NF in 2007 include Accord Concentrate® (glyphosate) and Oust® (sulfometuron methyl).

Substantial on-site monitoring is accomplished to assess interfering vegetation and tree seedling development in areas being regenerated through both even-aged and uneven-aged methods. A decision is made to apply herbicide in individual sites following monitoring and field (stocking) surveys that indicate the need to treat interfering vegetation in order for adequate tree seedlings to become established. Employees ensure that treatment occurs as planned and that appropriate mitigation measures are implemented. Besides the initial review of the site made at the time

treatment is planned, a qualified FS employee is on-site when herbicide treatment is in progress. This is required to ensure the contractor successfully implements the treatment prescription, including mitigation measures, and takes prompt corrective action, if necessary. Field surveys (stocking surveys) are used to monitor treated areas and assess vegetation response.

Approximately 30% of the annual acreage projected for herbicide application in the Forest Plan was treated in 2007. This is most likely due to the lower amount of shelterwood seed cutting and regeneration harvesting (both even-aged and uneven-aged) during the past three to five years.

Description of Fuels, Non-Native Invasive Species (NNIS), Wildlife, Fish and Stream Activities in FY 2007

Table 5. Comparison of Projected Fuels, NNIS, Wildlife, Fish and Stream Activities (Forest Plan, p 22)

Management Activity	Average Annual Decade One	FY 2007 Actual Accomplishment
Fuels, NNIS, Wildlife, Fish and Stream Activities		
Mechanical Hazard Fuel Treatments (Ac) FPO-47 evaluate 2012	350	0
NNIS Manual/Mechanical Treatment (Ac) FPO-03 evaluate 2012	500	34
Herbicide Treatment for Non-native Invasive Species FPO-03 evaluate 2012	110	0
Herbicide Treatment for Wildlife Objective FPO-29; see evaluation item #10 below	105	0
WL Opening Creation (Ac) FPO -24 evaluate 2012	15	11
Wildlife Enhancements (Ac) FPO-29; see evaluation item #10 below	1,600	800
Stream Restoration (Mi) FPO-32 evaluate 2012	2	0
Fish Habitat Structures (Ac) FPO-31 evaluate 2012	32	19

A pool of mechanical fuels projects is being developed in order to secure funding on a consistent basis. No mechanical fuels treatments were done in FY 2007.

During FY 2007, 34 acres of non-native, invasive species (NNIS) of plants were treated through manual (hand-pulling, cutting) and/or mechanical (weed eaters) methods by FS staff and volunteer groups. Some treatment sites are in their fifth year of treatment and have shown a decrease in the amount of extant vegetation (less percent cover or foot-print of the infestation). The majority of the species treated include: Japanese barberry (*Berberis thunbergii*), Canada

thistle (*Cirsium arvense*), bull thistle (*Cirsium vulgare*), Japanese knotweed (*Fallopia japonica*), reed canary grass (*Phalaris arundinaceae*), multiflora rose (*Rosa multiflora*), non-native bush honeysuckle (*Lonicera* sp.), purple loosestrife (*Lythrum salicaria*), and garlic mustard (*Alliaria petiolata*).

Treatment effectiveness monitoring plots will be officially established in 2008 for a sub-sample of new and/or existing treatment areas for evaluation every five years (Strategic Monitoring Objective (SMO)-01, Forest Plan, p 50, from Table 15. Strategic Monitoring Information). Treatment efficacy monitoring data reported each fiscal year in FACTS is based on the year of treatment and does not reflect 'biological monitoring'.

No herbicide treatment for NNIS or wildlife enhancement occurred in FY 2007. Some project level planning of treatment sites is underway.

In 2007, eleven acres of wildlife openings were created. This involved clearing the area of trees, shrubs, and large rocks; followed by seeding, fertilizing, and planting. Some openings were planted in warm season grasses while others were planted in cool season grasses with a scattering of shrubs and fruit trees. These openings provide summer brood rearing habitat for grouse, turkeys, and songbirds where young poults and parent birds feeding nestlings can forage on insects. Openings planted with shrubs and trees provide late fall mast for a variety of wildlife species.

Wildlife enhancement work is described below in FPO-29 (see evaluation item #10).

No stream restoration work occurred in FY 2007. Some project leveling planning of treatment sites is underway. Fish habitat structures were placed in the Allegheny Reservoir with volunteers from Kinzua Fish and Wildlife Association; this equated to 19 acres of improvement.

Description of Transportation Activities in FY 2007

Table 6. Comparison of Projected Transportation Activities (Forest Plan, p 22)

Management Activity	Average Annual Decade One	FY 2007 Actual Accomplishment
Transportation Activities		
Road Construction Existing Corridor (Miles) <i>contributes to FP access goals</i>	13	8
Road Construction New Corridor (Miles) <i>contributes to FP access goals</i>	5	4
Road Reconstruction (Miles) <i>contributes to FP access goals</i>	100	33
Road Decommissioning (System) (Miles) <i>FP-50 evaluate 2012</i>	2	1
Area Cleared for Gravel Pits (Acres)* <i>contributes to FP access goals</i>	5	5

* Conversion from cubic yards of stone to acres cleared for pits: 9700 cubic yards per acre.

No FPO were set for road construction, reconstruction, or area cleared for gravel pits. The level of annual accomplishment is dependant on the location and amount of timber offered each year. These actions support the Transportation System Goal listed in the Forest Plan on page 16 (Forest infrastructure..., is in balance with needed management actions). In FY 2007, all of the road construction and reconstruction occurred on timber sales to provide access for hauling timber, and protecting soil and water resources from adverse effects attributed by runoff. The eight miles of Road Construction Existing Corridor occurred on existing oil and gas management (OGM) roads that were upgraded to FS standards & guidelines under timber sale contracts. The four miles of Road Construction New Corridor created new access to timber harvest units where none existed. The 33 miles of Road Reconstruction involved work on existing roads beyond the level of annual maintenance directed through timber sale contracts.

The level of road decommissioning refers to only Forest System roads. Future access using these roads was determined to be no longer necessary. All drainage structures were removed and the road bed was reseeded.

The pit run stone material used for the road work equated to roughly 46,000 cubic yards, or 4.5 acres, so the estimate was rounded to 5 acres. This material came from several different pits so an actual acreage is not reported.

Description of Timber Harvest Management Practices by Management Area in FY 2007

Table 7 displays estimates of timber harvest activities by management area (MA) during the first decade compared with actual awarded (sold to an operator) accomplishment in FY 2007. The Average Annual Decade One column displays the acreage of projected timber harvest treatments that could occur under full implementation of the plan. The Actual FY 2007 Acres column shows the actual acres of harvest activity awarded in timber sales in FY 2007. These sales were awarded following project level decisions rendered under 1986 Forest Plan direction. They are displayed here to reflect the amount of progress toward the desired conditions projected by the Forest Plan.

The sum of all individual treatment activities does not equate to the total acreage of projected timber harvest because more than one type of harvest activity may occur on any given acre. For example, an area may be thinned in one decade, followed by a shelterwood seed cut and removal cut in the following decade.

Vegetation harvests sold for even and uneven-aged regeneration, and associated reforestation and timber stand improvement activities were compiled from vegetation databases, including the Timber Information Manager (TIM) and the FACTS databases.

Table 7. Annual Probable Timber Harvest Management Practices by Management Area (rounded to nearest 100 acres) Compared with Actual Completed FY 2007 Accomplishment (Forest Plan, p 23)

Management Area	Average Annual Decade One	Actual FY 2007 Acres
Intermediate Thinning		
MA 2.1	0	4 ¹
MA 2.2	20	271
MA 3.0	940	1,489
MA 6.1	40	0
Total Intermediate Thinning	1,000	1,764
Shelterwood Seed Cut		
MA 1.0	30	35
MA 2.2	40	113
MA 3.0	1,740	1,329
MA 6.1	30	0
Total Shelterwood Seed Cut	1,840	1,477
Acres of Even-aged Regeneration Harvest (Shelterwood Removal Cut and/or Clearcut) FPO-17 evaluate 2008		
MA 1.0	30	0
MA 2.2	20	172
MA 3.0	1,690	602
MA 6.1	10	0
MA 8.2	0	28 ²
Total Even-aged Regeneration Harvest	1,750	802
Acres of Uneven-aged Regeneration Harvest FPO-17 evaluate 2008		
MA 2.1	50	0
MA 2.2	620	81
MA 3.0	0	24 ³
Total Uneven-aged Regeneration Harvest	670	105
Notes:		
¹ 4 acres of thinning to salvage dead, damaged, or dying trees occurred in MA 2.1.		
² 28 acres of shelterwood removal was in MA 3.0 under 1986 Forest Plan direction, and fell just within MA 8.2 in the 2007 Forest Plan.		
³ 24 acres of single tree and group selection was sold in MA 3.0 to meet site specific resource objectives.		

Intermediate Thinning (Thinning, salvage, and sanitation harvest) – Thinning is an intermediate cut designed to enhance the growth and quality of trees by removing a portion of the trees in treated areas. Thinnings are prescribed for stands which contain trees at risk of dying during the next 5 to 10 years, and/or are highly stocked stands (normally >80 percent stand relative density) that need to have stocking levels reduced in order to enhance residual tree survival or to

concentrate growth on the best trees. Under normal conditions, treated stands are thinned to 60 to 79 percent relative density.

Due to continued response to the July 2003 windstorm, as well as the widespread decline and mortality that occurred in the latter part of the 1990s, intermediate thinning acres are higher in the short term than those projected in the Forest Plan. Of the 1,764 acres listed in the table above, 728 acres of thinning were sold to salvage dead, damaged, or dying trees. The 271 acres sold for intermediate thinning in the new MA 2.2 fell within MA's 3.0 and 6.1 under 1986 Forest Plan direction, and 109 acres of this were sold to salvage dead or damaged trees.

Shelterwood Seed Cut (Shelterwood or Two-aged Shelterwood Seed Cut) - A shelterwood seed cut is used on sites to establish tree seedlings and when there is an opportunity to increase the amount of young forest on the landscape to achieve wildlife and/or age-class diversity objectives by completing the subsequent shelterwood removal or two-aged harvest. A shelterwood seed cut can also be used on sites impacted by insects or diseases, where there is a need to regenerate the site to a fully stocked stand. Approximately one-third of the overstory trees are removed in the shelterwood seed cut to provide increased sunlight and encourage tree seedling development. Once adequate tree seedlings develop, the second step, called the shelterwood removal cut, occurs (see explanation in next subsection). Typically this treatment is prescribed for mature or maturing stands, and following the shelterwood removal cut, results in a single, regenerated age class.

Similar to intermediate thinning, many of the shelterwood seed cuts sold in 2007 were in response to the July 2003 windstorm, as well as the widespread decline and mortality that occurred in the latter 1990s. Of the 1,477 acres listed in the table above, 618 acres of shelterwood seed cuts were sold to start the process to regenerate poorly stocked or heavily damaged stands to young, well stocked forest. Similarly, of the 113 acres sold for shelterwood seed cutting in the new MA 2.2, 84 acres were sold to regenerate poorly stocked, heavily damaged stands. These areas in the new MA 2.2 fell within MA's 3.0 and 6.1 under 1986 Forest Plan direction.

Acres of Even-aged Regeneration Harvest (Shelterwood Removal Cut, Clearcut, or Two-aged Harvest) - Even-aged regeneration harvest on the Allegheny NF can occur through a shelterwood removal cut, clearcut, or two-aged harvest. Each method is described below. Shelterwood removals and clearcuts result in young, single-aged stands; whereas, two-aged harvests result in stands comprised of two age classes: young and mature. In all three methods, the removal of overstory trees results in rapid growth and development of tree seedlings, shrubs, and herbaceous understory vegetation, though to varying degrees.

Shelterwood removal cuts and two-aged harvests typically follow shelterwood seed cuts, once abundant tree seedlings have become established. In a shelterwood removal cut, nearly all of the overstory trees (except for wildlife and reserve trees) originally left as a seed source during the shelterwood seed cut are removed, thus allowing full sunlight to reach established seedlings. Residual trees, or legacy trees that include snags, den trees, conifer, mast species, and uncommon species, are retained following harvest. In some cases, a two-aged harvest may occur with 20 to 30 percent of the trees retained from the original stand to meet wildlife, scenic quality, or other resource objectives.

Clearcutting is a regeneration method used to establish even-aged stands where all trees, except for residual or legacy trees, are removed in one harvest. It is normally used where abundant tree seedlings are already present on the forest floor, where established sapling or small pole regeneration exists, or in areas with high potential to develop new seedlings following harvest. The even-aged regeneration figures in the table above include areas that were salvaged following extensive wind and/or insect, and disease damage, resulting in complete regeneration of these sites. In these situations, seed trees are not well distributed across the site following catastrophic damage. In some cases, a salvage shelterwood removal cut was used because a shelterwood seed cut had occurred in the recent past, and advanced tree seedling regeneration was present when these stands were impacted. In other cases, a salvage clearcut was applied because stands were heavily damaged prior to any efforts to establish tree seedlings through a shelterwood seed cut. In this case, most overstory trees are dead, dying, or damaged to the point that a salvage clearcut is the best option in order to regenerate the area. In salvage clearcuts, particular attention is paid to seedling development, and additional follow-up reforestation treatments are often necessary to ensure a well stocked, young forest reoccupies the site. All of the clearcuts sold in 2007 were in response to catastrophic damage from wind and/or insects, and diseases.

Of the 802 acres listed in the table above, 303 acres of even-aged regeneration harvests were sold to regenerate poorly stocked or heavily damaged stands to young, well stocked forest. Similarly, of the 172 acres sold for even-aged regeneration in the new MA 2.2, all but 18 acres were sold to regenerate poorly stocked, heavily damaged stands. The remaining 18 acres consisted of a two-aged harvest to meet wildlife habitat needs.

Acres of Uneven-aged Regeneration Harvest (Single Tree or Group Selection) - Uneven-aged stands, consisting of three or more age classes, are developed on the Allegheny NF through either single tree or group selection methods.

Group selection is an uneven-aged regeneration technique and involves harvesting all trees in small groups. Groups are placed where advanced tree seedlings are present naturally, or became established through a previous single tree selection. Single tree selection harvest is used prior to a group selection harvest in order to develop advanced tree seedlings and transition even-aged stands to uneven-aged stands. Groups normally occupy 15 to 20 percent of a stand, and provide full sunlight conditions on the ground that enables the establishment, development, and growth of a diversity of seedlings.

Single tree selection is an uneven-aged regeneration technique that involves harvesting individual trees, or small clusters of trees, to develop small pockets of tree seedlings. When it is followed up with single tree selection again in the future (as opposed to following up with group selection), the tree seedlings that survive and mature are very tolerant of shade, such as sugar maple, American beech, and eastern hemlock. As significant forest health concerns surround the future of all three of the species on the Allegheny NF, single tree selection is discouraged in the 2007 Forest Plan, except under specific circumstances (USDA-FS 2007a, p A-24).

As can be seen in the table, 105 acres of uneven-aged regeneration harvests were sold in 2007; 81 acres fell within the new MA 2.2. Similar to even-aged regeneration harvests, a large proportion (77 acres) of the 105 acres was to treat dead, dying, or damaged forested areas. Twenty-four acres of group and single tree selection were sold in MA 3.0, either as a follow up to previously initiated uneven-aged management, or in areas considered to be sensitive. Roughly

eighty percent (84 acres) was group selection. The remaining 21 acres were single tree selection to meet site specific resource objectives.

Summary: Actual acres sold for various types of timber harvest using different silvicultural methods to move towards Forest Plan desired conditions were generally less than that projected in the Forest Plan. The exception is intermediate thinning where more acres were sold than projected in the Forest Plan. This is largely due to the need to salvage dead, damaged, or dying trees impacted by insects and diseases in the latter 1990s or the 2003 windstorm. Accomplishment of outputs and services as projected in the Forest Plan were closely tied to annual budgets; these projections for outputs excluded salvage treatments.

In the long term, if acres treated through timber harvest continue to be lower than Forest Plan projections, landscape-level desired vegetative conditions and Forest Plan goals and objectives related to forest vegetation will not be met. It is recommended to continue monitoring outputs and services designed to move the Forest towards desired landscape-level vegetation conditions.

Description of Timber Volume Sold in FY 2007

One key decision of the Forest Plan is the identification of the ASQ of timber. The ASQ is the maximum amount of timber that can be harvested from the Allegheny NF within a certain time period from lands that are suitable for timber production. This volume is scheduled for harvest and considered sustainable on a long term basis. Although the ASQ is identified as an annual average quantity for each decade of the plan, the amount produced in any one year may be either below or above the identified ASQ as long as the totals for the decade are not exceeded (USDA-FS 2007a, p 24).

The ASQ is measured in cubic feet, although conversions are produced for board feet. Table 8 compares the FY 2007 sold accomplishment with the ASQ in the cubic volume measure and the board foot equivalent. Only the cubic volume is the controlling measure for evaluating compliance with the requirement not to exceed the ASQ in the plan period. Since FY 2007 is a transition year, the first full year in Decade 1 will actually be FY 2008.

Table 8. Comparison of Average Annual ASQ to FY 2007 Volume Sold

Forest Plan Harvest Volume Unit of Measure	Average Annual ASQ Decade 1	FY 2007 Volume Sold
Million Cubic Feet (MMCF)	8.9	5.6
Million Board Feet Equivalent (MMBF)	54.1	35.4

The budgeted target in FY 2007 for timber awarded was 32.2 million board feet. The actual volume awarded (sold) in 2007 was 35.4 million board feet, or 109 percent of the target. This includes 3.2 million board feet coming from timber sales offered for sale in FY 2006 that had been awarded in 2007. Harvest volumes were tracked by volume “offered” for sale in monitoring and annual reports completed through 2006. The volumes shown in the table above for FY 2007 are based on “award” which includes those sales for which a valid contract has been awarded by end of the fiscal year.

Timber from the Allegheny NF has substantial economic value and contributes to local and regional economies. The volume awarded in 2007 had a total value of \$18.6 million, of which \$18.5 million was sawtimber.

Conclusions and Recommendations – Since 2007 was a transitional year between the 1986 Forest Plan and the 2007 Forest Plan it is too early to evaluate the Forest Plan program level accomplishments. Many of the vegetation output levels are developed from the previous three to five years of project level NEPA decisions. It will be important to project trend lines for accomplishments over the next few years to make reasonable conclusions and develop meaningful recommendations.

4. MLO #21 Prescriptions and Effects

(Forest Plan, p 41) – from Table 13. Minimum Legally Required Monitoring Items.

Action, effect or resource to be managed	Monitoring Question	Monitoring Frequency	Evaluation Frequency	Precision/Reliability
Prescriptions and effects (36 CFR 219.12(k)(2))	How have prescriptions and effects been measured?	Annual	Annual	A/B

Application of Silvicultural Guides for Intermediate Thinnings and Shelterwood Seed Cuts:

Protocol – Timber sale marking checks were conducted in 2006 and 2007 by gathering new silvicultural examination plot data for 5 intermediate thinning and 11 shelterwood seed cuts on both Ranger Districts. The plot data was used to generate new SILVAH summaries for each monitored stand to determine whether the marking followed the silvicultural prescription and whether interdisciplinary modifications were incorporated in the silvicultural prescription. SILVAH is the stand analysis program developed by the Northern Forest Experiment Station in Irvine. The program is used to evaluate vegetation data, to quantify silvicultural characteristics of a stand, and to develop silvicultural prescriptions.

Results - Certified silviculturists prepared or reviewed the prescriptions. Coordination with other resource uses was considered good for all reviewed stands. Less common tree species were retained in all reviewed stands, consistent with silvicultural prescriptions.

Intermediate Thinnings - Timber sale marking checks were completed for five intermediate thinnings, all on the Bradford Ranger District. The prescriptions were implemented well in three stands. The remaining two thinning treatments could have been marked a little heavier in the pole and small sawtimber class to reduce relative density to the target 60 percent in order to best maximize stand level growth.

Shelterwood Seed Cuts - Timber sale marking checks were completed for eleven shelterwood seed cuts; four on the Bradford Ranger District and seven on the Marienville Ranger District. In six of these eleven areas, the prescriptions were implemented well. In one stand, insufficient basal area was removed. The stand will be monitored to determine if seedlings will develop or if additional basal area should be removed. In one stand, the relative density was reduced below that prescribed, but residual basal area was very close to the original prescription. Adequate, well distributed seed trees are present in this stand.

The remaining three stands were marked too heavily for a typical shelterwood seed cut. Though residual basal areas were close to, or below, that specified in the silvicultural prescription in these three areas, the residual relative densities (42 to 45 percent) are lower than normally applied (50-60 percent) in shelterwood seed cuts on the Forest. In one of these stands, the prescribed residual basal area was low. Seed trees were well distributed in these stands, and they will be monitored for seedling development and subsequent treatment needs.

Conclusion and Recommendations – Overall, the monitored silvicultural prescriptions integrated various resource considerations and met silvicultural prescriptions to move landscapes towards desired conditions established in the Forest Plan. Both intermediate thinnings and shelterwood seed cuts retained a diversity of tree species. Thinning prescriptions were marked within, or very close to, relative densities specified in the prescriptions.

Prescriptions to regenerate hardwoods occurring on the Allegheny Plateau focus on using relative density as the appropriate measure for stand level stocking because relative density captures differences in the stocking of various tree species (Marquis, DA, Editor. 1994. Quantitative Silviculture for Hardwood Forests of the Alleghenies. General Technical Report NE-183. USDA Forest Service, p 88-90). Local silvicultural guidelines recommend that relative densities be reduced to 50 to 60% in shelterwood seed cuts in Allegheny Plateau hardwoods (Marquis, et al. 1994, p 223). Forest Plan standards call for retention of at least 50% canopy closure in partial/intermediate harvests, including shelterwood seed cuts (USDA-FS, 2007a, p 82). This equates to roughly 43% relative density in forest types found on the Allegheny NF.

A few shelterwood seed cut prescriptions were marked below the 50-60% relative density normally applied on the Forest, and one prescription reduced relative density below that specified in the Forest Plan for partial harvests. To remedy this, it is recommended that both Districts specify both target relative densities and basal areas in their silvicultural prescriptions. Including only target basal areas in prescriptions will not account for the different growth characteristics and site requirements of various tree species, whereas relative densities do.

Marking check data was inconsistently collected between the two districts. One district collected the majority of their marking check data following marking, but before the stands were cut. In this manner, new silvicultural examination plot data could be collected for the original stand and compare it to the residual stand that will result from the same data set. The other district collected stand level inventories to monitor silvicultural prescription implementation after the harvest treatment. Stand level inventories can vary over time due to growth or mortality of individual trees. Additionally, actual layout of the area to be treated can affect the stand inventory. To accurately assess actual basal area to be removed and reduction in relative densities, it is recommended to collect stand level silvicultural examination data prior to the harvest treatment, following layout and marking, so existing and residual figures can be compared from the same data collected at the same time. It is recommended to increase frequency of marking checks on both Districts to monitor implementation of silvicultural prescriptions in all types of prescriptions.

5. MLO #23 Effects of Management Practices

(Forest Plan, p 41) – from Table 13. Minimum Legally Required Monitoring Items.

Action, effect or resource to be managed	Monitoring Question	Monitoring Frequency	Evaluation Frequency	Precision/Reliability
Effects of Management Practices (36 CFR 219.11(d))	To what extent have standards and guidelines been applied?	Annual	Annual	A/B

A wide array of management practices are applied each year on the Forest. Each year, effectiveness monitoring will be performed on a few activities. This year, standards and guidelines were evaluated for Leave Tree Analysis and Herbicide Use Buffer Zones.

Leave Tree Analysis in Final Harvest Areas

Protocol – A one-hundred percent tally was completed for all live trees greater than nine inches diameter at breast height (dbh) remaining in 40 regenerated stands totaling 867 acres. These areas were final harvested in 2002, 2003, 2004, and 2006. Seven of the sample areas (14% of total sample acreage) were salvage final harvests. These stands were marked for harvest under 1986 Forest Plan standards and guidelines.

Forest Plan standards and guidelines call for retention of around 14 live trees per acre in final harvests as follows:

- Where they occur, 5 trees per acre greater than 20 inches diameter with cavities for den trees;
- 3 live trees greater than 20 inches in diameter of preferred Indiana Bat roost trees (oak, hickory, maple, and ash);
- 6 additional live trees per acre greater than 10 inches diameter;
- 9 snags per acre greater than 10 inches diameter, where available; and
- One-quarter acre reserve area for each five acres of harvest (can contain some of the trees listed above).

Results

Live Tree Retention - Based on this sample, an average of 12.4 live dispersed trees per acre (± 1.7 at 95% confidence) were retained in final harvest areas across both Districts, not counting the reserve area trees. Trees retained in reserve areas increased the total trees left per acre in final harvest areas to well over 14 trees per acre.

Without counting reserve area trees, Bradford retained 10.3 live trees per acre (± 2.1) (includes every other payment unit boundary tree). When reserve area trees were included, Bradford retained 15.6 trees per acre (± 1.9) in final harvests sampled.

Without counting reserve area trees, Marienville retained 14.5 live trees per acre (± 2.6) (includes all reserve area and payment unit boundary trees). Data on reserve area trees were not available for sampled Marienville final harvest units.

From a review of marking guidelines and observations in the field, it appears both Districts are retaining less common species, mast producers, snags, and trees beneficial to wildlife or other resource objectives.

Dead Tree (Snag) Retention - Based on this sample, an average of 3.6 snags per acre (± 0.7 at 95% confidence) were retained in final harvested areas across both Districts (reserve area trees not included).

Without counting reserve area trees, Bradford retained 3.6 snags per acre (± 0.9) using the reserve tree marking method.

Without counting reserve area trees, Marienville retained 3.5 snags per acre (± 1.2) using the cut tree marking method in sampled final harvests.

Conclusion and Recommendations – From this analysis, it appears the Marienville District is retaining statistically greater numbers of live trees outside of reserve areas than the Bradford District, though they are not designating reserve trees with paint. Regardless, both the cut tree and reserve tree marking methods appear to retain sufficient reserve trees to meet Forest Plan standards and guidelines relative to wildlife, and threatened and endangered species habitat. The number of live residual trees retained on both Districts falls within the typical even-aged regeneration range for stands on the Allegheny NF (10-15 trees per acre, USDA-FS 2007d, p B-23). Stands that retain greater than 15 live trees per acre are transitioning more towards a two-aged condition, particularly if more than 20 trees per acre remain. Most final harvest areas sampled did not contain sufficient numbers of snags to meet Forest Plan standards and guidelines because insufficient snags were present at the time of marking.

Post harvest monitoring data is collected and summarized differently on each district, reducing the utility of the data. Variability in numbers of live trees left is likely due to differences in data collected, different forest types (trees per acre vary prior to harvest), prescriptions, and salvage treatments included in the sample. Less variability exists between Districts in terms of snag retention, most likely because all snags were retained in green harvests (which constituted the vast majority of this sample) under 1986 Forest Plan direction. The number of snags retained is primarily a function of how many were present at the time of marking.

In future years, use the same protocols between districts to collect leave tree monitoring data to increase utility of data for future analysis.

Visual Monitoring of Broadcast Herbicide Application Buffer Areas

Protocol – The Allegheny NF began to implement broadcast herbicide application on an operational level in 1987. Herbicides are used to remove understory woody and herbaceous vegetation that interferes with the establishment and growth of tree seedlings. Forest personnel conduct substantial on-site monitoring to ensure that treatment occurs as planned, that appropriate mitigation measures are implemented, and to assess vegetation response to treatment. Several methods are used to evaluate the effectiveness of buffer areas for herbicide application. Visual assessment monitoring is one method used.

Visual assessment monitoring was completed in a sample of areas that received herbicide treatment in 2003 and 2004 to determine if certain environmental protection standards and

guidelines, called Management Requirements and Constraints (MRC), as specified in the 1991 Understory Vegetation Management FEIS for herbicide application on the Allegheny NF¹, were being met. This monitoring meets the MRC for monitoring of spray deposition, as specified on page 5-4 of the FEIS, item 9. Monitoring was completed to ensure MRCs for buffers to maintain water quality were met (page 5-2, item 1 of the FEIS), as well as ensuring herbicide spray remained within designated treatment areas (page 5-3, item 13 of the FEIS).

A sample of areas that received Glyphosate (Accord®) and Sulfometuron Methyl (Oust®) in 2003 and 2004 were visually monitored in October of 2004. A sample of areas that received Oust-only in 2003 was also visually monitored. Treatment blocks that received Oust only in 2004 were not sampled, as injury or death of vegetation from Oust would not be visible until the 2005 growing season.

A seasonal employee completed the monitoring approximately two months following 2004 herbicide treatment, and 12-14 months following 2003 herbicide treatment. During the sampling period, herbicide injury to plants or their death was readily evident. Based on the appearance of targeted vegetation within treatment blocks, the employee was able to ascertain if similar herbicide damage occurred outside of any treatment blocks, or within any buffer areas. The entire perimeter of each sampled area was walked, as well as the boundary of all buffer areas within treatment blocks, and a visual assessment of any herbicide injury or death of vegetation completed. This visual assessment was used as an indirect measure of spray drift to assess if herbicide stayed within each treatment block, and to determine if any overspray or herbicide damage resulted within buffer areas.

Results - The following buffer widths were applied to herbicide treatment areas:

- 75 feet along each side of perennial streams, impoundments, or intermittent streams with flowing water the day of spraying.
- 50 feet along each side of dry intermittent streams and spring seeps.
- 25 feet around wet areas with no defined outlet.

2003 Treatment Area Monitoring Results

One sampled Accord® and Oust® treatment area had no visible evidence of death or injury to vegetation outside the treatment area boundary or within buffer areas. The remaining sampled area showed evidence of plant injury or death outside the treatment area boundary only. The areas with visible herbicide damage outside the treatment block consisted of three spots of overspray extending 2-6 feet beyond the treatment area boundary. The vegetation in areas where overspray occurred was very similar to the vegetation within the treated area. No visible injury or death of vegetation from herbicide treatment was noted inside buffer areas or outside treatment area boundaries in any of the 2003 Oust®-only sample units.

¹ USDA, Forest Service. 1991. The Understory Vegetative Management Final Environmental Impact Statement. Warren, PA

Table 9. Results of Visual Monitoring of Herbicide Treated Areas.

	2003 Herbicide Treatment		2004 Herbicide Treatment	
	Glyphosate & Sulfometuron Methyl	Sulfometuron Methyl	Glyphosate & Sulfometuron Methyl	Sulfometuron Methyl
Total Number of Areas Treated	5	6	11	4
Number of Areas Sampled	2	3	5	N/A
RESULTS				
Herbicide Damage Outside Treatment Area	1	0	3*	N/A
Herbicide Damage Inside Buffer Area	0	0	2*	N/A
No Herbicide Damage Outside Treatment Area or Within Buffer	1	3	1	N/A
* <i>Note: These are not additive since one area had vegetation damage evident both outside the treatment area, and within a buffer area.</i>				

2004 Treatment Area Monitoring Results

Of the five Accord® and Oust® stands sampled, one area had no visible evidence of death or injury to vegetation outside the treatment area boundary or within buffer areas. Two of the sampled sites showed evidence of plant injury or death outside the treatment area boundary only. One sampled site showed evidence of herbicide damage to vegetation in spots outside the treatment boundary and just inside buffer areas (50-75 foot buffer). The remaining sampled site showed herbicide injury to two points within a buffer area (50-75 foot buffer). The areas with visible herbicide damage outside treatment blocks or within buffer areas were 2-6 feet long, and no more than five feet outside the targeted treatment area. The vegetation in areas where overspray occurred was very similar to the vegetation within the treated area.

Conclusion and Recommendations on Buffer Effectiveness Results - Of 10 areas total where visual monitoring was completed, two areas showed evidence of vegetation damage within a buffer for a watercourse. These areas of overspray were 2-4 feet long, and no more than 4 feet into the outer edge of the buffer area. Notes taken on one of these areas indicate the buffer applied was larger than that specified in the MRCs, which compensated for the overspray. As shown on the maps completed during monitoring of these areas (both treated in 2004), no vegetation damage was evident adjacent to the water source being buffered, indicating buffers are effective in keeping herbicides from inadvertently entering the watercourse.

It is recommended to continue utilizing buffer strips to ensure watercourses are protected from unintentional herbicide application. It is recommended to continue visual monitoring of treatment area boundaries and buffer areas in a sample of stands treated with herbicide.

Visual Monitoring of Electric ROW Low-Volume Herbicide Application Buffer Areas

Protocol– Several electric rights-of-way are treated with herbicides to control tall growing vegetation under powerlines managed by Penelec, a regional utility company. Vegetation management of these rights-of-way was analyzed in an Environmental Impact Statement (EIS) completed in 1997 (Environmental Consultants Inc., 1997). One of the concerns covered by the EIS was the protection of water resources located near rights-of-way. As a result, mitigation measures outlined in the EIS require the placement of untreated buffer areas around watercourses. To comply with the monitoring requirements set forth in this EIS, visual sampling is conducted on a random sample of 10% of all buffers around water bodies or watercourses that had water present at the time of treatment. For efficiency, these samples are carried out and summarized every two years.

Low volume foliar and cut stump treatments with glyphosate (Accord®) and imazapyr (Aresenal®) were applied in 2003, 2004, 2005, and 2007 to treat tall growing vegetation beneath powerlines. Ten-foot untreated buffer zones were left along all watercourses with water present at the time of treatment. To ensure that 2003 and 2004 electric rights-of-way herbicide treatment followed guidelines for buffering of watercourses, a ten percent random sample of 2003 and 2004 buffer areas was generated, and visual monitoring completed on sample sites. Four buffer sites were sampled and inspected in June 2005. To ensure that 2005 and 2006 electric rights-of-way herbicide treatment followed guidelines for buffering of watercourses, a ten percent random sample of 2005 and 2006 buffer areas was generated, and visual monitoring completed on sample sites. Four buffer sites were sampled and inspected in August 2007. At all sample sites, visual assessment was used as an indirect measure of spray control at each site to assess if herbicide stayed within each treatment block, and to determine if any overspray or herbicide damage resulted within buffer areas.

Results

2003-2004 ROW Treatments: - At three of the sampled sites inspected, no visual herbicide use or damage was observed within the ten-foot buffer zone. At the fourth sample site, two locations were observed to have herbicide damage visually evident within the ten-foot buffer zone. At one location, a six by eight foot area of damage was found in the middle of the buffer zone. At the other location, a six by six foot area of herbicide damage was found along the outer edge of the buffer. The damage was the result of over-spraying at both locations. However, the herbicide damage observed clearly showed that the application did not reach the watercourse. In the cut stump treatment sample site, stump sprouts were present on cut stumps within the buffer zone on both sides of the water source, indicating herbicide was not used on them.

2005-2006 ROW Treatments: - No herbicide damage was observed on any vegetation anywhere within the 10-foot buffer zones on either side of any protected watercourses at any of the sample sites. In the cut stump treatment sample sites, stump sprouts were present on cut stumps within the buffer zone on both sides of the water source, indicating herbicide was not used on them.

Conclusion and Recommendations – Though two areas of overspray less than six by eight feet were observed at one right-of-way treatment site sampled in 2005, herbicide clearly did not enter the watercourse, and the buffer area was wide enough to protect the watercourse. It is recommended to continue using untreated buffer areas along watercourses to prevent herbicide from inadvertently entering watercourses during rights-of-way treatments. It is recommended to continue monitoring a sample of powerline rights-of-way treated with herbicide.

Monitoring of Water Quality to Evaluate Effectiveness of Broadcast Herbicide Application Buffer Areas

Protocol— Several methods are used to evaluate the effectiveness of buffer areas for herbicide application. Direct monitoring of water quality in watercourses near herbicide treatment blocks is one method of evaluating the effectiveness of buffer areas in preventing herbicides from inadvertently entering watercourses. One of the areas treated in 2002, located in close proximity to a stream, was chosen to monitor the effectiveness of the buffers in preventing herbicides from entering the water. The area is located on the Bradford Ranger District. Root Run, a perennial fish-bearing stream, is located to the northwest of the sampled treatment site. Forest Road 142C and an OGM road border the site on two sides. The buffer between the treated site and the stream met the Forest Plan standard of 75' to flowing water on the day of spraying. The roads have ditches between them and the treated unit, with a couple outlet ditches that connect to the stream.

The 15 acre site was treated on August 7, 2002, using an FMC[®] air blast sprayer. To treat the edges of the unit, the sprayer stayed outside of the treatment area and sprayed the material into the unit to prevent any over-spray from going outside the intended area of treatment. Two types of herbicide were used, Accord[®] (active ingredient glyphosate) and Oust[®] (active ingredient sulfometuron-methyl). Mixed with the 425 gallons of water were 3.4 gallons of Accord[®] (0.8% solution by volume) and 34 dry ounces of Oust[®] (0.05% solution by weight). Also included in the mix was 1.06 gallons of surfactant to increase herbicide absorption by the vegetation. The weather on the day of application was clear and dry, and the ground condition was also dry.

In order to assess the chemical composition of water collected from Root Run, two automatic samplers were used. One sampler, American Sigma[®] Model 900, was placed upstream of the treatment site as a control, and second one downstream of the treatment area. A programmable instrument on the samplers was set to collect four separate samples every 24 hours, each consisting of one individual pumping of about 175 milliliters (ml) taken every six hours.

Pre-treatment samples were taken by hand at each site on the morning of August 7, 2002. Both the pre-treatment control and downstream sites were analyzed to set the baseline to see if any of the herbicides might already be present in the water. After this, only water collections taken from the downstream site were analyzed once the treatment commenced. Water samples were taken at both the control and the downstream sites for 17 days following herbicide treatment. Samples from the control sites were analyzed only if herbicide active ingredient was detected at the downstream site.

Results - No measurable rainfall was recorded at the monitoring site for five days following treatment. Two-tenths of an inch of rain fell six days after treatment of the unit. Measurable rainfall was recorded at the monitoring site 8 of the 17 days water quality was monitored. This unit had some risk of introducing elements into Root Run because the ditch-lines paralleled two sides of the unit. These ditch-lines were dry during the application phase, and thus prevented any possible over-spray from getting routed to the stream. The detection limits used by the lab are very sensitive. During the 17 days of monitoring for herbicide from the treatment site, no

detectable amounts of glyphosate, AMPA (Aminomethyl phosphonic acid, a metabolite of glyphosate) or sulfometuron methyl were found in the water samples collected from Root Run.

Conclusion and Recommendations – The buffers were effective at preventing the herbicides from entering Root Run. It is recommended to continue use of buffers to prevent herbicide from entering watercourses, and to continue periodic direct monitoring of water quality in a sample of watercourses near any herbicide treatment blocks.

6. FPO #08 Evaluate ANF Road System Suitable for Snowmobile Use
(Forest Plan, p 43) – from Table 14. Achievement of Forest Plan Objectives.

Forest Plan Objective	Monitoring Question	Monitoring Frequency	Evaluation Frequency	Precision/Reliability
2350 Trails				
Evaluate ANF road systems to identify which roads are suitable for snowmobile use utilizing the Travel Management Process.	Are roads and trails designated for snowmobile use marked and signed?	Annual	Annual	B

Protocol - New regulations governing motor vehicle use on national forests and grasslands have been established under the 2005 Travel Management Rule (*36 CFR Parts 212, 251, 261, and 295 Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule*) The CFRs make a distinction between ‘motor vehicles’ and ‘over the snow vehicles’. Travel management planning is required by each national forest for motor vehicles but is optional for over the snow vehicles. The final rule prohibits the use of motor vehicles off a designated system, as well as use of motor vehicles on routes and in areas that is not consistent with the designations.

The clear identification of roads, trails, and areas for motor vehicle use on each national forest will enhance management of National Forest System (NFS) lands; sustain natural resource values through more effective management of motor vehicle use; enhance opportunities for motorized recreation experiences on NFS lands; address needs for access to NFS lands; and preserve areas of opportunity on each national forest for non-motorized travel and experiences. The final rule is consistent with provisions of Executive Order 11644 and Executive Order 11989 regarding off-road use of motor vehicles on Federal lands.

Even though ‘over the snow’ vehicles are exempt from mandatory designation the responsible official may propose restrictions or prohibitions. Included within the body of 36 CFR 212, subpart B, are procedures that describe the restriction or prohibition of ‘over the snow’ vehicles including public involvement, coordination with governmental agencies, revision of designations, and application of criteria in 36 CFR 212.55. It is the intent of the Allegheny NF to use the procedures outlined in 36 CFR 212.55 to evaluate future additions to the snowmobile trail system.

Results – Roads and trails designated for snowmobile use can be found on the current Snowmobile Trails Map (2004) which meets the requirements of 36 CFR 212.55 and the need to

publish an ‘over the snow’ map. Routes were marked and signed during the 2007 snowmobile season. (Also, see results to FPO–07 below.)

Conclusions – Unmanaged recreation, including impacts from off-highway and motor vehicles, represents one of [four key threats](#) facing the nation’s forests and grasslands. Once travel planning is complete, the Forest will use a national framework for designating a sustainable system of roads, trails, and areas for motor vehicle use to secure a wide range of recreation opportunities while ensuring the best possible care of the land. This meets Forest Plan goals (p 13) and objectives and national directives for managing off-highway vehicles, motor vehicles, and ‘over the snow’ vehicles.

Recommendations – The Forest is required by law (Travel Management Rule) to evaluate and update a motor vehicle use map on an annual basis. The Forest will also adhere to any changes and/or new directives regarding travel management planning for off-highway vehicles including over the snow vehicles. Specific to over the snow vehicles, the Forest will maintain a current over the snow vehicle use map that will show where it is legal for the public to ride.

Follow the procedures in 36 CFR 212.55 for any changes to the snow trail system.

7. FPO #09 Facilitate Regular Grooming of Designated Snowmobile Trail System

(Forest Plan, p 43) – from Table 14. Achievement of Forest Plan Objectives.

Forest Plan Objective	Monitoring Question	Monitoring Frequency	Evaluation Frequency	Precision/Reliability
2350 Trails				
Facilitate regular grooming of the designated snowmobile trail system if Commonwealth funding is available.	To what degree has the ANF contributed to snowmobile grooming?	Annual	Annual	B

Protocol - Recreation personnel keep track of how much time is spent grooming trails in order to help determine over-all accomplishment and program of work in the recreation program. Monitoring of snowmobile trail grooming is based on accomplishment and does not involve detailed data collection therefore, there is no protocol. An annual accomplishment report details what trails were groomed and what efforts were made to facilitate regular grooming.

Results - In 2007, the Allegheny NF purchased two snow grooming machines through a grant administered by the Pa. DCNR. The first groomer arrived on January 14th, 2007, with the second machine arriving on February 9th, 2007. The two machines spent a combined eleven weeks grooming trails across the entire Forest. The Forest also coordinated with the Forest County Snowmobile Club who was able to groom several connector trails in the Russell City, Marienville, and Kelletville areas with their new snow grooming machine. The grooming program proved to be successful in its first year of operation; the northern half of the Forest received the greatest benefit because of higher snowfall amounts.

Utilizing the same grant funds the FS and the Allegheny Federation of Snowmobile Clubs worked together to complete two deferred maintenance projects on the Marienville Ranger District to provide a stable trail foundation and facilitate trail grooming. Without repairs to the trail corridor quality grooming results are not possible.

The first group work day took place on July 28th, 2007, on trail connector 12. Work crews brushed sections of trail and removed hazard trees, while others installed new culvert pipes and moved gravel from stockpiles with heavy equipment to cover the new pipes and harden wet sections of trail.

Grooming started Feb 5, 2007, & went to March 1, 2007, six days/week, 12 hrs/day. On December 17 & 18 there were two 10 hour shifts per day. All grooming was on trail 1, the Allegheny Snowmobile Loop.

Conclusions – The amount of grooming will vary from year to year depending on amount of snow, available staff, and equipment. For FY 2007, the Forest met the objective of regular trail grooming.

Recommendations – Continue to pursue deferred maintenance projects with volunteers to provide quality grooming results.

8. FPO #11 Provide Snowmobile System Connectors

(Forest Plan, p 44) – from Table 14. Achievement of Forest Plan Objectives.

Forest Plan Objective	Monitoring Question	Monitoring Frequency	Evaluation Frequency	Precision/Reliability
2350 Trails				
Utilize partnerships with snowmobile clubs, local communities, State agencies, and private landowners to provide snowmobile system connectors across private lands to Tionesta, Ridgway, Sheffield, and Bradford.	What connectors have been developed?	Annual	Annual	A

Protocol – The same protocol governing travel planning and the Travel Management Rule (as described above for FPO “Evaluate ANF road systems to identify which roads are suitable for snowmobile use utilizing the Travel Management Process.”) applies to this objective.

Results – None – no connectors were built.

Conclusions – Objective has not been met. This objective is highly dependent on other land owners as the FS does not control access through other ownership.

Recommendations – Follow procedures in 36 CFR 212.55 for any additions to the ‘over the snow’ use map.

9. FPO #17 Maintain or Create Age Class Diversity on Lands Suitable for Timber Management

(Forest Plan, p 45) – from Table 14. Achievement of Forest Plan Objectives.

Forest Plan Objective	Monitoring Question	Monitoring Frequency	Evaluation Frequency	Precision/Reliability
Maintain or create age class diversity on lands suitable for timber management to provide for sustainable forest ecosystems and high quality hardwood timber products by treating an estimated 1,400 to 1,800 acres using even-aged regeneration methods and treating 300 to 700 acres using uneven-aged methods, annually.	How many acres of even-aged regeneration harvest and uneven-aged harvest have occurred?	Annual	Annual	A/B

Protocol and Results – Vegetation harvests sold for even and uneven-aged regeneration were compiled from vegetation databases, including TIM and FACTS databases. In total, 802 acres were sold for even-aged regeneration (includes areas regenerated to one or two age classes) in 2007. Of these, 273 acres of even-aged regeneration harvests were sold to regenerate poorly stocked or heavily damaged stands to young, well stocked forest. This was to address extensive wind and/or insect and disease damage that occurred in the past 15 years. Eighteen acres in MA 2.2 were sold to be regenerated using a two-aged method. In total, 105 acres were sold for uneven-aged regeneration using both the single tree (21 acres) and group selection (84 acres) methods. See the #MLO-20 Comparison of Projected and Actual Outputs and Services section for more detail.

Conclusions and Recommendations – Desired ecosystem conditions for the Forest include sustaining a diversity of vegetative structural stages and age classes across the landscape, within the context of multiple use management. Early structural stages created by timber harvest or natural disturbance will comprise 8 to 10 percent of the forested landscape (USDA-FS 2007a, pp 11, 19). In order to provide desired ecosystem conditions, FPO include maintaining or creating age class diversity of lands suitable for timber management by annually treating 1,400 to 1,800 acres using even-aged regeneration methods, and 300 to 700 acres using uneven-aged methods (USDA-FS 2007a, p 19).

Between 2001 and 2006, the Forest annually sold an average of 894 acres of even-aged final regeneration harvests. The total acreage sold for even-aged regeneration (802 acres) in 2007 is lower than the average sold in the past six years, and less than that specified in FPO to sustain desired ecosystem conditions. The 105 acres sold for uneven-aged regeneration was also less than that specified in FPO to sustain desired ecosystem conditions.

In the longer term, if even-aged and uneven-aged regeneration harvests continue to be lower than FPO, landscape-level desired vegetative structural stages and age classes will not be sustained at levels sufficient to meet desired Forest Plan ecosystem conditions. It is recommended to increase to 1,400+ acres annually, continue monitoring progress towards achieving FPO and achievement of desired vegetation conditions.

10. FPO #20 Enhance Terrestrial Wildlife Habitat

(Forest Plan, p 46) - from Table 14. Achievement of Forest Plan Objectives.

Forest Plan Objective	Monitoring Question	Monitoring Frequency	Evaluation Frequency	Precision/Reliability
Enhance terrestrial wildlife habitat to provide desired cover and forage conditions on 1,200 to 1,600 acres, annually.	How many and what type of terrestrial habitat enhancements have been implemented?	Annual	Annual	A

Protocol – Acres of habitat enhancements are completed by district wildlife staff and recorded in the Wildlife Work Plans by the Forest Wildlife Biologist.

Results – In FY 2007, 344 acres of habitat enhancement were completed using appropriated funds and 467 acres were completed using Knutsen-Vandenberg (KV) funds, for a total of 811 acres. A breakdown of habitat enhancements by funding source and activity are provided in Table 10.

Table 10. Wildlife Habitat Enhancements by Funding Source for 2007.

Appropriated Funds	Acres
Planting	100
Prune and release	48
Opening enhancement	14
Mowing	182
Total	344
KV Funds	
Planting	231
Fencing/tubex	21
Prune and release	90
Opening enhancement	80
Seeding	45
Total	467

Conclusions – The amount of habitat enhancements completed in 2007 is below the FPO of 1,200 to 1,600 acres each year. Although deviations from this moderate level may occur from time to time, continual accomplishments below this level will compromise the goal to “maintain and enhance the distribution and diversity of plant and animal species by providing a diversity of high quality habitats across the landscape” (Forest Plan, p 14) and to “explore opportunities for habitat restoration/enhancement...” (Forest Plan, p 15).

Recommendations – Increase enhancement acres to minimum objective of 1,200 acres as continued low level of accomplishment will compromise long term goals. Evaluate after five years of Forest Plan implementation.

11. FPO #39 Prevent Introduction of Zebra Mussels

(Forest Plan, p 47) - from Table 14 Achievement of Forest Plan Objectives.

Forest Plan Objective	Monitoring Question	Monitoring Frequency	Evaluation Frequency	Precision/Reliability
2600 Wildlife, Fish and Sensitive Plant Habitat				
Prevent the introduction of zebra mussels into the Allegheny Reservoir and the Allegheny River from Forest Service boat launch sites. (FPO-39)	Are zebra mussels in the Allegheny Reservoir? What is the risk of zebra mussel introduction from Forest Service boat launches?	Annual	Annual	B

Protocol – To assess whether zebra mussels are present in the Allegheny Reservoir, the shoreline on each side of FS boat launches are walked a minimum ¼ mile to visually determine if they are present. This assessment is normally done after the reservoir drops to at least a pool elevation of 1318’ mean sea level (msl) (or a drop of at least 10’ from summer pool elevation of 1328’ msl) in the fall. If a dock is present at the launch, it is also inspected for zebra mussels. The assessments are conducted by employees.

To determine the risk for introduction of zebra mussels into the Allegheny Reservoir, a series of predetermined questions are asked boaters before they launch their watercraft. Employees conduct the survey. The objective is to screen at least 500 boats for the risk assessment. A sample of boaters are surveyed. Launch sites that typically receive the highest use are targeted first. The assessment is primarily conducted during the recreational boating season from Memorial Day to Labor Day. In addition to the questionnaire, boat trailers parked at launch sites are visually inspected for the presence of aquatic vegetation and/or zebra mussels. The objective is to visually inspect at least 1,000 trailers. The overall goal is to keep the risk low over the life of the Forest Plan.

This particular monitoring item addresses two of the many conservation measures agreed to by the U.S. Fish and Wildlife Service and the Allegheny NF for two endangered mussels. These two mussels, clubshell and northern riffleshell, are present in the Allegheny River and could be affected by zebra mussels moving downstream out of the reservoir should they become established. Other conservation measures associated with these two mussels are discussed in Strategic Management Objective (SMO)-12 later in this report.

Results – A shoreline survey of five of the seven developed boat launches was conducted. No evidence of zebra mussels was found during the surveys conducted in the fall of 2007.

Shoreline Surveys at Boat Launch sites

- Dewdrop – shoreline survey conducted on each side of launch on 10-31-2007, at 1400-1500, at a pool elevation of 1310.4’ msl. No evidence of zebra mussels was detected.

- Elijah - shoreline survey conducted on each side of launch on 9-22-2007 at a pool elevation of 1319.73' msl. This survey was conducted when the pool elevation was higher than the 1318' msl when surveys are normally done. No evidence of zebra mussels was detected.
- Roper Hollow – shoreline survey conducted on each side of launch on 10-18-2007 at a pool elevation of 1313.35' msl. No evidence of zebra mussels was detected.
- Webbs Ferry - shoreline survey conducted on each side of launch on 10-18-2007 at a pool elevation of 1313.35' msl. No evidence of zebra mussels was detected.
- Wolf Run – shoreline survey conducted on each side of launch on 10-6-2007 at a pool elevation of 1317.01' msl. No evidence of zebra mussels was detected.

Risk Assessment

The following two tables summarize 1) the risk for introduction of zebra mussels into the Allegheny Reservoir based on personal interviews with boaters and, 2) the number of parked trailers with aquatic vegetation and/or zebra mussels.

Table 11. Watercraft at Risk Based on Personal Interviews of Boaters in 2007.

Launch	Risk		
	Low	Medium	High
Elijah	20	0	0
Willow Bay	63	3	2*
Wolf Run Marina	7	1	0
Total	90	4	2*

** these 2 were jet skis that had previously launched in Lake Erie*

Table 12. Trailer Counts at Forest Boat Launches in 2007.

Launch	# Trailers Screened	# with Vegetation	# with Zebra Mussels
Dewdrop	13	0	0
Dunkle	2	0	0
Elijah	209	3	1*
Kiasutha	83	0	0
Willow Bay	157	0	0
Wolf Run Marina	160	3	0
Total	624	6	1*

** this was a trailer from Ohio, and the carpeted pads had numerous zebra mussels which were desiccated when surveyed.*

Of the 96 watercraft that were screened at the launch site, 2 (2.1%) were at high risk for introducing zebra mussels into the reservoir. Of the 624 trailers inspected in the parking lots, a total of 6 trailers (0.97%) had vegetation, zebra mussels, or both.

Conclusions - The number of screenings and trailer counts was below the objective in this first year of implementation of the 2007 Forest Plan. Over the period from 2000-2002 when 11,114 watercraft were screened at launch sites, 1.3% were determined to be at moderate-high risk for introducing zebra mussels. In 2007, and based on a much lower number of watercraft screened, the percentage increased slightly. Similarly, over the period from 2002-2004, 14,631 trailers were visually inspected, resulting in 0.9% having vegetation on them that could harbor zebra mussels.

The 2007 results show a slightly higher risk based on a much lower number of trailers inspected. Through educational efforts conducted by Forest personnel including personal contact and signs at launches, and recreational boaters becoming more conscientious about invasive species, the introduction of zebra mussels has thus far not occurred from watercraft users launching at FS sites on the reservoir. In addition, the drawdown of the reservoir each year could desiccate any zebra mussels that might get introduced.

Recommendations - Continue with annual inspections of the shoreline and any associated docks at FS boat launches. Also continue with boat screenings and trailer counts at FS boat launches to determine the risk of zebra mussel introduction. In order to reach the objective of 500 boat screenings and 1,000 trailer inspections, an individual will need to be primarily dedicated to this task in 2008. Risk needs to be assessed each year as agreed to by the U.S. Fish and Wildlife Service and the Forest to: 1) maintain a “May affect, not likely to adversely affect” determination on the two endangered mussels, and 2) monitor whether risk stays low over the life of the Forest Plan.

12. FPO #41 Evaluate Productivity of Bald Eagles

(Forest Plan, p 47) - from Table 14. Achievement of Forest Plan Objectives.

Forest Plan Objective	Monitoring Question	Monitoring Frequency	Evaluation Frequency	Precision/Reliability
Maintain or increase productivity of bald eagles on the ANF.	What is the status of known bald eagle nests on the ANF? How many young are produced?	Annual	Annual	A/B

Protocol – Known nests are observed in the field each year. Reports of new nests are field verified. Some searches for new nests are conducted annually in high potential nesting habitat.

Results – Of the 10 known eagle territories within the proclamation boundary, five were documented as active in 2007. Two active nests failed for unknown reasons while the remaining three nests fledged a total of four young (0.8 young per occupied nest).

Conclusions – An annual productivity of 0.8 young per occupied nest is below the National recovery objective of 1.0 young per occupied nest. Annual productivity on the Forest over the past 12 years remains above the National recovery objective (Biological Assessment for Forest plan Revision (2006 p 33)).

Recommendations - Continue to monitor nest success.

13. FPO #45 Acres Treated to Increase Plant Species Diversity

(Forest Plan, p 48) - from Table 14. Achievement of Forest Plan Objectives.

Forest Plan Objective	Monitoring Question	Monitoring Frequency	Evaluation Frequency	Precision/Reliability
<p>Improve the overall health and sustainability of ANF forest ecosystems by reducing understory dominance of native species, such as beech brush, ferns, grass and striped maple, and non-native invasive species (NNIS) to encourage greater species diversity of herbaceous, shrub, or tree seedlings on 3,000 to 6,200 acres annually (through direct treatment such as site preparation, herbicide application, scarification, and fencing).</p>	<p>How many acres have been treated to increase plant species diversity (with site preparation, herbicide application, and fencing)?</p>	<p>Annual</p>	<p>Annual</p>	<p>A</p>

Protocol and Results – Acres of site preparation, herbicide application, and fencing were compiled from the FACTS database. In total, 2,315 acres were treated with site preparation or herbicide in order to reduce dominance by interfering plants that prevent a diversity of herbaceous and tree species from becoming established, or fenced to reduce deer browsing impacts. FPO include reducing the understory dominance of native invasive species such as beech brush, ferns, grass, and striped maple, and NNIS by treating 3,000 to 6,200 acres annually (USDA-FS 200a, p 21). Herbicide application and area fencing acres were well below forest plan projections and objectives (See #MLO-20, Table 10). Herbicide application levels were below that projected, primarily due to fewer acres receiving shelterwood seed cuts and regeneration harvests (using either even-aged or uneven-aged methods) than projected in the Forest Plan. Deer browsing impacts have dropped in recent years because overall deer populations are reduced. As a result, the need to fence has declined markedly. See the #MLO-20 Comparison of Projected and Actual Outputs and Services section for more detail.

Conclusions and Recommendations – Desired ecosystem conditions include restoration of understory vegetation and vertical diversity, including multiple vegetative layers in order to enhance the resiliency of Forest ecosystems (USDA-FS 2007, p 11). Site preparation, herbicide application, and area fencing are important tools to help reduce dominant understory vegetation that prevents a diversity of plants and tree seedlings from becoming established and contributing to compositional and structural diversity. An abundance and diversity of forest plants and trees will improve the overall health, resiliency, and sustainability of Forest ecosystems.

In the longer term, if treatments to reduce interfering, invasive vegetation continue to be lower than FPO, understory vegetation conditions will not be improved enough to meet desired Forest

Plan ecosystem conditions. It is recommended to increase acreage treated to minimum objective level of 3,000 acres – understory desired conditions will not be fully met at present level. Continue monitoring progress towards achievement of desired understory vegetation conditions, and the overall health and sustainability of Forest ecosystems.

14. SMO #09 Bald Eagle Conservation Measures

(Forest Plan, p 51) - from Table 15. Strategic Monitoring Information.

Resource Area	Monitoring Question	Monitoring Frequency	Evaluation Frequency	Precision/Reliability
Wildlife, Fish and Sensitive Plants	Are bald eagle conservation measures being implemented? What management activities are occurring within suitable nesting, foraging and roosting habitat?	Annual	Annual	A/B

Protocol – Bald eagle conservations measures and protocols are listed below. Conservation measures are described in detail in the U.S. Fish and Wildlife Service concurrence memo (1-31-2007, pp 4 & 5).

1. Activities within 660 feet of nest – review of approved National Environmental Policy Act (NEPA) documents and Plans of Operation (minerals).
2. Restrict recreational activities with 660 feet of nest – on-the-ground monitoring of recreational activities near nests.
3. Restrict road and trail construction, timber harvest, and OGM activities within 1,320 feet of nest during the nesting season – on-the-ground monitoring of these activities during the nesting season.
4. Road/trail closures near nests – on-the-ground observations indicate changes in eagle behavior.
5. Maintenance of scattered white pines within 300 feet of major drainages and Allegheny Reservoir – on-the ground observations, review of NEPA documents, and Plans of Operation for projects along major drainages and reservoir.
6. Smoke considerations in burn plans for prescribed burning near eagle nests – review of burn plans.
7. Notify U.S. Fish and Wildlife Service of OGM activities within 1,320 feet of nest - review of Plans of Operation and review of correspondence.
8. Site specific eagle hazard reduction plan for new power lines - review of new power line proposals (special use permits).
9. Monitor potential impacts and report to U.S. Fish and Wildlife Service – on-the-ground observations.
10. Clean-up of discarded fishing line and lures – Volunteers organized to perform clean-up and report to Bradford Ranger District.
11. Erect signs or issue news releases to educate public about eagles - review record of news releases and new signs.

Results –

1. No timber activities, oil and gas activities, nor road and trail construction activities occurred within 660 feet of any active eagle nests.
2. The Cornplanter nest is vulnerable to boating and camping traffic. Signs were placed along the shoreline in past years to warn people not to camp there. In 2007, this nest was active but abandoned sometime in April or May. Since the nest failed prior to the beginning of the main boating and camping season (prior to Memorial Day), the nest abandonment is not believed to be associated with increased recreational activity.
3. No road and trail construction, timber harvest activities, nor mineral activities occurred within 1,320 feet of an eagle nest during the nesting season.
4. The non-system road near the Grove Run nest and the trail near the Kiasutha nest remained closed during 2007. The Kiasutha nest successfully fledged one young. The Grove Run nest tree blew over.
5. No white pines were harvested on NFS lands within 300 feet of the major drainages and Allegheny Reservoir.
6. A burn plan was completed for fields near the Hall Barn. Smoke considerations were included to reduce potential impacts to the nearby eagle nest. However, the field was not burned in 2007.
7. No oil and gas activities occurred within 1,320 feet of any eagle nest.
8. No new power lines were approved in 2007.
9. No new impacts to eagle nests or foraging and roosting areas were identified.
10. The Youth Conservation Corps and volunteers cleaned up fishing line and lures along the shores of the Allegheny Reservoir each month during the summer.
11. During 2007, the bald eagle was taken off the Federal Endangered Species list. This action spawned several newspaper articles in which the status of eagles on the Forest was reported. No eagle news releases were produced by the Forest.

Conclusions – Despite wide-spread human activity associated with recreation, vegetation management, and oil and gas development, the integrity of active eagle nest sites is being maintained and reproduction is continuing at a steady rate. New eagle nests are being discovered on a regular basis indicating that the population is expanding and suitable habitat is available.

Recommendations – continue to monitor the implementation of eagle conservation measures.

15. SMO #10 & #11 Indiana Bat Conservation Measures

(Forest Plan, p 51) - from Table 15. Strategic Monitoring Information.

Resource Area	Monitoring Question	Monitoring Frequency	Evaluation Frequency	Precision/Reliability
Wildlife, Fish and Sensitive Plants	Are conservation measures for the Indiana bat being implemented?	Annual	Annual	A/B

Protocol – Indiana bat conservation measures and protocols are listed below.

1. In timber harvest units retain ¼ acre reserve areas, snags, large live trees, and all shagbark hickories. In partial harvests retain canopy closures >50% – compliance checks and snag longevity monitoring.
2. Protect all known roost trees and all maternity roosts - on-the-ground monitoring of known roosting sites.
3. Notify U.S. Fish and Wildlife Service if known Indiana bat occurrences are located in the vicinity of proposed mineral developments – review of Plans of Operation and correspondence.
4. Conduct prescribed burns within any maternity colony area only during the hibernating season – review of burn plans.
5. Do not demolish buildings that harbor bats between 4/15 and 8/15; install bat boxes - review of plans to demolish buildings.
6. Survey for bats. Consult with U.S. Fish and Wildlife Service if Indiana bat is captured – Complete 20 to 30 bat mist net surveys every third year. Periodically monitor bats in caves in cooperation with Pennsylvania Game Commission.

Results - 1. (a) Compliance checks were completed on five final harvest units on 2007 (Table 13). These units were selected from a group of units that were harvested in 2007.

Table 13. Final Harvest Units' Compliance Checks for 2007.

Sale-Payment Unit #	9 snags/ac>10"*	3 live trees/ac>20"*	6 live trees/ac>10"*
Forest Renewal-10	2.0	2.5	9.0
Forest Renewal-8	0.3	5.7	2.7
Forest Renewal-14	2.6	2.2	7.9
Forest Renewal-7	0.9	1.6	6.8
Nansen Salvage-21	3.4	0.8	8.0

*Guideline in Forest Plan which was not in place when timber harvest occurred.

1. (b) Compliance checks were also completed on five partial harvest units all of which were salvage harvests (Table 14). These units were selected from a group of units harvested in 2007.

Table 14. Partial Harvest Units' Compliance Checks for 2007.

Payment Unit #	Total trees/ ac	Dead trees/ ac	Live trees/ ac	% Relative Density	% Canopy Closure
HeHa-20	105	21	84	41	49
HeHa-23	389	10	379	71	76
HeHa-24	170	3	167	73	78
Jumpoff-4	97	6	91	56	62
Roadside-6	58	9	49	33	41

1. (c) The Biological Opinion from the U.S. Fish and Wildlife Service for the 1986 Forest Plan, as amended, required the monitoring of the longevity of snags, den trees, and live trees at intervals of 1, 3, 5, 7, and 10 years. This conservation measure was carried over into the 2007 Forest Plan. The results of the snag longevity study are summarized in Table 15.

Table 15. Range of Changes in Reserve Trees from Year 1 through Year 5 (# of trees).

Range of changes from year 1 to 3								
Snags			Den Trees			Live trees		
<10"	10-20"	>20"	<10"	10-20"	>20"	<10"	10-20"	>20"
-7.7 to 0.5	-3.4 to 10	-0.4 to 0.1	-2.5 to 6.9	-4.0 to 15.4	-1.5 to 3.0	-45.5 to 19.6	-10.3 to 28.3	0.4 to 14.5
Range of changes from year 3 to 5								
-5.5 to 1.7	-4.0 to 2.3	-1.7 to 1.5	-9.3 to 0.0	-25.6 to 1.0	-6.1 to 6.2	-17.0 to 27.8	-28.3 to 2.0	-15.0 to 3.1
Range of changes from year 1 to 5								
-6.0 to 0.0	-5.0 to 6.1	-1.7 to 0.5	-5.7 to 5.3	-23.3 to 3.8	-6.1 to 6.2	-17.7 to 2.6	-8.3 to 10.0	-0.5 to 3.9

2. No roost trees or maternity roosts are known to occur on the Allegheny NF.
3. No Indiana bats were discovered on the Allegheny NF in 2007.
4. No prescribed burns were planned near maternity colonies in 2007.
5. No buildings containing bats were demolished in 2007.
6. No mist net surveys were conducted in 2007.

Conclusions – The compliance checks were compared to the guidelines in the revised Forest Plan although the timber harvest occurred under the guidelines in the 1986 Forest Plan, as amended.

None of the five final harvest payment units met the guideline for retaining nine snags per acre greater than 10 inches dbh. Under the 1986 Forest Plan, the guideline was 5 – 10 snags per acre greater than 9 inches dbh. This old guideline was not met in any of the five units measured. The likely reason for not meeting this guideline is most of these units were salvage of blown down trees and standing snags were just not present in these units.

The second guideline calls for the retention of three live trees per acre greater than 20 inches. This 2007 Forest Plan guideline was met in one out of five units. The 1986 Forest Plan guideline called to the retention of one live tree per acre greater than 20 inches. This guideline was met in four out of five units measured. Many stands do not have live trees greater than 20 inches. The guidelines call for the largest trees to be left if 20 inch dbh trees are not present.

The third guideline calls for the retention of an additional six live trees per acre greater than 10 inches dbh. This guideline was met in four out of five units measured. The guideline in the 1986 Forest Plan called for the retention of 8 – 15 live trees per acre greater than 9 inches dbh. This guideline was met in three out of five units measured.

For partial harvests in healthy stands the guidelines call for retaining canopy closure at more than 50 percent. Although none of the partial harvests were in healthy stands, three of the five stands were above 50 percent and one was just below at 49 percent.

These results indicate that more emphasis needs to be placed on retaining snags. Retaining snags and trees that may become snags during the first entry (partial harvest) may result in more snags available for retention in the final harvest. Further review of the Forest Plan tree retention guidelines with the marking crews and silviculturists may be appropriate.

The Allegheny NF may support a very low population of male Indiana bats. The risk to these bats from implementation of Forest Plan activities is extremely low.

Recommendations – In 2007, compliance checks were completed on only 10 units primarily because this was a transition year from one planning period to the next. In 2008, compliance checks should be completed on 20 units and emphasis should be placed on sampling “green” units, and not salvage units.

16. SMO #12 Conservation Measures for Clubshell and Northern Riffleshell Mussels

(Forest Plan, p 51) - from Table 15 Strategic Monitoring Information.

Resource Area	Monitoring Question	Monitoring Frequency	Evaluation Frequency	Precision/Reliability
2600 Wildlife, Fish and Sensitive Plant Habitat				
Wildlife, Fish and Sensitive Plant Habitat	Are conservation measures for the clubshell and northern riffleshell mussels being implemented? (SMO-12)	Annual	Annual	B

Protocols - The conservation measures for the two mussels are outlined in Appendix C of the Forest Biological Assessment (BA) completed during Forest Plan revision and submitted to the U.S. Fish and Wildlife Service. The U.S. Fish and Wildlife Service restated numerous design criteria from the Forest Plan and included them in the 2007 Forest BA (pp 66 to 70) as conservation measures to implement in order to reach a “May affect, not likely to adversely affect” determination in their concurrence letter (1/30/2007). These conservation measures pertain to activities within the 13% Area, which is the area of the Allegheny NF that drains directly into the Allegheny River.

The protocols for the measures are varied and, likewise, the methods used to determine their implementation vary.

Appendix C Protocols

The following table summarizes the seven measures in Appendix C of the Forest BA, with the protocols to follow.

Conservation Measures in Appendix C of the Forest BA
1-3. Educational material will be provided on preventing the spread of zebra mussels.
4. Agency coordination will occur in the event of zebra mussel presence.
5. Report occurrence of dead endangered mussels to USFWS.
6. Determine zebra mussel presence in Allegheny Reservoir.
7. Water quality monitoring, standards and guidelines effectiveness monitoring, and activities addressed with runoff concerns will occur.

Measures 1-3

These relate to educational materials and signs posted at boat launches to keep the public aware of how to prevent the spread of zebra mussels. Before the beginning of the boating season (Memorial Day weekend), educational materials are made available to various venues, such as concessionaires that manage campgrounds and boat launches, Forest offices, bait shops, and sporting goods stores, marinas, and visitor centers. Enough material is left for the public to take a personal copy. The materials are replenished during the boating season as needed. Larger signs posted at the marina and boat launches about the prohibition of launching watercraft that may contain zebra mussels and the methods to be used to decontaminate a watercraft are inspected and replaced with new ones if needed.

Measure 4

To accomplish measure 4, contact is made with Pa. Department of Environmental Protection (DEP) about any latest documented occurrences in the river, and whether there are any plans to address their presence.

Measure 5

This measure requires the Allegheny NF to report to the U.S. Fish and Wildlife Service any dead endangered mussels that are collected, and is accomplished primarily by word of mouth from boaters and anglers, other agencies, or others that are on the river.

Measure 6

The protocol for this measure is stated in Item 11 above (FPO-39) of this report.

Measure 7

The seventh measure in Appendix C actually contains six items related to water quality. The first five items are addressed through visual monitoring conducted by Forest personnel, such as engineers, trail managers, oil and gas administrators, biologists, and soil and water resource personnel, during their normal work in the field and with scheduled visits to areas where the potential for water quality concerns could occur. A field visit or a discussion with the Contracting Officer Representative upon completion of any road or trail surfacing work is done to determine if the work meets the surfacing guidelines that have been prescribed to address runoff concerns.

The sixth item under this measure is accomplished by Forest personnel; water samples are generally collected during runoff events in order to assess the amount of fine sediment being transported by the streams. Two streams, Hedgehog Run and Grunder Run, are currently being monitored.

Protocols

The conservation measures are not numbered in the concurrence letter from the U.S. Fish and Wildlife Service, but will be numbered here in the order they are stated in the letter. The letter outlines 20 measures, some of which are the same as that in Appendix C. The following table summarizes these measures.

Conservation Measures from the U.S. Fish and Wildlife Service Concurrence Letter
1-3. Land disturbing activities will be planned, evaluated, and implemented to protect endangered mussel habitat, including the implementation of riparian corridor guidelines, conservation measures, and water quality protection guidelines in DEP field guides and manuals.

4-5. Wood removal from streams is only done according to the guideline in the Forest Plan and firewood permit language.
6. Existing aquatic uses are protected when water is drafted from a stream.
7. Buffers will be implemented to protect water quality when using herbicides within the 13% Area.
8-9. Roads and motorized trails constructed or reconstructed on NFS lands within 300' of a stream within the 13% Area will be surfaced with a high quality stone to minimize sedimentation. In the event this cannot be achieved, the U.S. Fish and Wildlife Service will be notified.
10-14. Stream crossings are outlined in these five measures, and include guidelines for surfacing, revegetation, providing for passage of aquatic species, sizing a culvert to accommodate a minimum 50-year flow, and accommodating a bank-full flow when using a temporary crossing structure.
15-17. These three measures address private oil and gas activity on the Allegheny NF and state that oil and gas development shall meet FS standards for the construction of roads, that the Forest is to notify the operator and copy the U.S. Fish and Wildlife Service if there is a known occurrence of federally listed species in the vicinity of a proposed development, and operators will implement and maintain their submitted Soil Erosion and Sedimentation Control Plan and Spill Prevention Plan.
18. This measure is the same as that listed under Appendix C, <i>Measure 7</i> above.
19. Timber harvesting, vegetation management, and road management within the Allegheny Wild and Scenic River corridor are addressed in this measure. Timber harvesting and vegetation management will only be carried out to address: recreation and scenery management activities; user safety; wildlife concerns; forest health; catastrophic events; improvement of habitat for species of concern; restoration of ecosystems; maintenance of existing unique or important wildlife features or plant communities; maintenance or expansion of existing facilities or trails; conservation, research, or education around heritage sites; and timber salvage and associated reforestation. Existing roads or aerial harvest will be used for salvage harvests. Roads will not be constructed on islands. Roads will be limited to those needed for public access, service, or maintenance. New road construction will be limited to that required for designated special uses or by law. Roads will be decommissioned if they are causing environmental damage, degrading outstandingly remarkable values, or to manage visitor use and access.
20. The last measure states that further consultation with the U.S. Fish and Wildlife Service is required if: <ul style="list-style-type: none"> a. new access sites to the Allegheny River are authorized, funded, or constructed by the FS; b. any activities do not follow any of the above 19 measures within the 13% Area; c. any activities are anticipated to contribute large amounts of sediment beyond what was analyzed in the Forest BA or; d. any activity increases the risk of zebra mussel introduction to the Allegheny Reservoir.

Measures 1-3

These measures will be evaluated in the field during or soon after completion of land-disturbing activities. Areas where buffers, including riparian corridors, are established will be assessed on a random basis to determine if they were implemented according to Forest Plan guidance.

Measures 4-5

The removal of any wood would likely be to protect bridges and culverts on the forest, as well as for the protection of private property. This can be assessed through discussions with engineers on the forest on whether this action occurred. For firewood collection, people cutting firewood are periodically checked by Forest personnel to insure they are in compliance with language in the permit; a permit requirement is that firewood cannot be taken from streams.

Measure 6

The drafting of water is not monitored continuously, as the drafting that does occur is by private oil and gas developers. When Forest personnel see a concern with maintaining existing uses, DEP will be notified.

Measure 7

To evaluate the application of this buffer when using herbicides near water, a field review will be conducted on a sample of sites where this buffer was, or should have been, used.

Measures 8-9

This will be determined through field visits or in discussions with Contracting Officer Representatives. In the event that a high quality surfacing stone is not used on roads within 300' of a stream on NFS lands, the U.S. Fish and Wildlife Service will be notified in a letter.

Measures 10-14

To assess if these measures were completed as planned, field visits will be conducted and/or discussions will take place with Contracting Officer Representatives to ascertain their implementation. This will occur on constructed and reconstructed crossings.

Measures 15-17

The FS will work with developers during the planning and layout phases to incorporate the appropriate design features for roads.

When a known federally listed species is within the area of proposed development, the FS will notify the operator and U.S. Fish and Wildlife Service.

Oil and gas administrators will monitor the implementation of the erosion and spill prevention plans, and will communicate any concerns to DEP.

Measure 18

See Appendix C Protocols – *Measure 7*. These two measures are similar.

Measure 19

An evaluation by a Forest Biologist will be made of any proposed activities within the Wild and Scenic River corridor to insure they comply with this measure.

Measure 20

The four items listed under this measure, as they become known, will be presented to the U.S. Fish and Wildlife Service.

Results - Appendix C Measures 1-3 were accomplished in 2007, but the initial distribution of materials did not occur until early June, after Memorial Day, due to temporary employee hiring constraints.

For the fourth measure, a contingency plan was not discussed or developed by other agencies in 2007. No zebra mussels were detected in the Allegheny River in the vicinity of the Forest during 2007. DEP was consulted on both these points.

Under the fifth measure, the FS wouldn't necessarily be the agency that an incident would be reported to, but we did not hear of any reports of unnatural deaths of individuals in 2007.

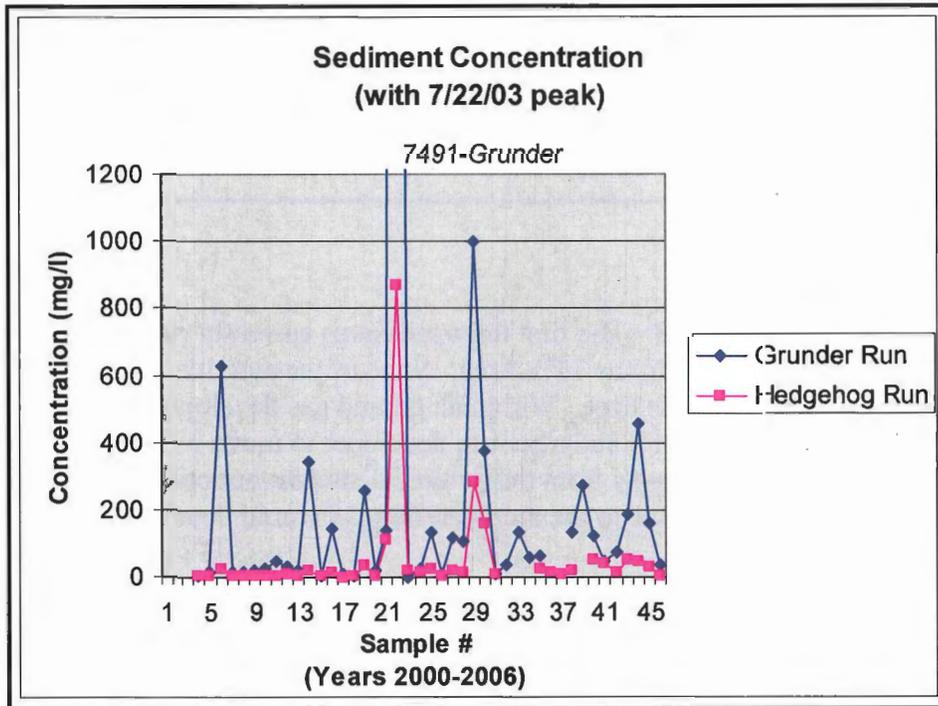
For the sixth measure there were no reported problems identified.

The seventh and last measure in Appendix C was accomplished through various means.

- In 2007, 2,876' of the Grunder Loop of the Rocky Gap ATV/Bike Trail was surfaced with limestone. This consisted of four different sections of the trail that had been identified as a concern for runoff into nearby streams. The Contracting Officer Representative verified the completion of the trail surfacing.
- Two road locations are proposed for limestone surfacing totaling 0.56 miles to address runoff concerns in the 13% Area.
- For timber harvesting activities, this information was reported in the Forest BA that was submitted to the U.S. Fish and Wildlife Service in November 2006. To summarize, nine timber harvesting units were monitored in the 13% Area to assess the effectiveness of standards and guidelines under the 1986 Forest Plan to protect streams. Treatments included commercial thinning, single tree selection, stand clearcut, shelterwood, and overstory removal. Streams were buffered from harvesting activities by either boundary delineation where the stream course was outside of the actual cutting area, or a buffer was used to protect streams inside a cutting area. Where timber harvesting occurred near a stream, buffer strip widths were measured. The buffer widths ranged in size from 50 feet in a commercial thinning and single tree selection operation, an 80 foot buffer in a stand clearcut, and 100-120 foot buffers for shelterwood and commercial thinning harvests. A visual observation of the buffer strip was made to determine if there was any off-site sediment movement in the buffer. In all cases, there was no evidence of sediment movement off-site from harvesting activities. As a result, standards and guidelines (buffers) from the 1986 Forest Plan were effective at preventing the movement of sediment into nearby streams. Under the 2007 Forest Plan, the riparian corridor guidelines have yet to be assessed. One timber sale within the 13% Area is currently active (Little Hammer Timber Sale), but involves the harvesting of oak trees that are far beyond any streamcourse and, thus, buffers were not required.
- Guidelines for the operation of oil and gas developments were monitored by Forest oil and gas administrators. The one thing observed was the lack of maintenance of silt fences. Silt fences are placed according to the Soil Erosion and Sediment Control Plan, but were not being maintained.
- Oil and gas administrators continue to randomly monitor private oil and gas leases located on the Forest. In 2007, no cases were noted where oil, gas, or brine were being improperly stored. Sediment from roads, however, continues to be identified as a concern on some leases within the 13% Area. Several locations are known to be contributing sediment to nearby streams. The FS is currently working with private operators to address these concerns through better road maintenance, proper culvert sizing, better management of runoff, and reducing sedimentation. As an example, Forest personnel are working with KCS Energy in the Grunder Run watershed to address runoff concerns and replacement of an undersized culvert with one that will accommodate a minimum of a 50-year flood.

- The sixth point under this measure has no results to report for 2007. Water samples were collected from the two streams being monitored for sediment, but results are not yet available. To provide a basis for comparison as the Forest begins implementing the Forest Plan, the following figure depicts results from water samples collected from 2000-2006.

Figure 1. Sediment Concentration from Water Samples Taken from Grunder Run and Hedgehog Run, 2000-2006.



The first stream, Grunder Run, is located in a 3,171 acre watershed that is dominated by intensive oil and gas activities, dirt and gravel roads, and off-highway vehicle trails. Approximately 84% of the drainage (2,657 acres) is managed by the FS. There are 5.4 miles of mapped stream, one stone pit, and 455 recorded oil and gas wells in the drainage. There has been no timber harvest activity on NFS land since 2000 in this drainage. The road density for all jurisdictions averages 8.89 mi/mi², with a road density of 0.91 mi/mi² within 300 feet of a mapped stream. Timber harvesting is currently being proposed in this watershed. Many of the non-system roads in the Grunder Run watershed used for OGM were constructed in the early 1980's by private lease holders. See table below.

Hedgehog Run, the second stream, is primarily located in the Allegheny National Recreation Area and has almost no land-disturbing activity where NFS land is located in the 2,758 acre watershed. This watershed has 6.8 miles of perennial and intermittent streams. The road density for all jurisdictions averages 2.09 mi/mi², with a road density of 0.05 mi/mi² within 300 feet of a mapped stream. See following table.

Table 16. Comparison of Road Densities within the Grunder Run and Hedgehog Run Drainages, October 2006.

Drainage	Acres	All jurisdiction on all ownerships		All jurisdiction within 300' of a stream on all ownerships		FS roads on all ownership (miles)	FS roads within 300' of a stream (miles)
		Total Miles	Road density (miles/mile ²)	Total Miles	Road density (miles/mile ²)		
Grunder Run	3,171	44.03	8.89	4.52	0.91	0.90	0.00
Hedgehog Run	2,758	9.00	2.09	0.21	0.05	1.03	0.00

Results

Concurrence Letter Measures 1-3 - The first three measures currently pertain to one FS project, Meads Mill, being analyzed within the 13% Area. None of the activities have occurred yet and, thus, can not be reported on at this time. Within an oil and gas development, one road section location was negotiated between FS and a private developer to move it further from a stream. The road will be moved further away from the perennial stream, but could not be moved any further to meet the buffer width due to the fact that the road would “bump up” against existing wells.

Measures 4-6 address woody material removal from streams, firewood collection from various water resources, and drafting of water from streams. These measures are intended to protect headwater sources that could have downstream affects to the endangered mussels in the Allegheny River. Specifically, firewood permits issued by the FS were updated after the Forest Plan was signed in March 2007 and now contains language prohibiting the removal of wood from streams and other water sources. No specific incident of wood removal was noted during 2007.

Measure 7 outlines buffers to be used when using herbicide near water. In 2007, no herbicide was applied within the 13% Area.

Measures 8-9 include language to surface dirt and gravel roads, and motorized trails, within 300' of a stream with a high quality surfacing stone. Limestone surfacing is normally what is used in these instances when a road or trail is reconstructed or constructed. No FS roads were constructed or reconstructed in 2007 within the 13% Area. In one case, the U.S. Fish and Wildlife Service was notified by the FS about the refusal by a private oil and gas operator to surface a dirt and gravel road with a high quality stone. See Appendix C results above, specifically under measure 7.

Measure 10 deals with minimizing the number of road and trail crossings of streams, and erosion associated with these crossings. In 2007, no FS road or trail crossings were constructed within the 13% Area.

Measure 11 is associated with measure 10. Since no crossings were constructed or reconstructed, this measure was not required in 2007.

Measure 12 relates to providing the appropriate crossing to allow fish and aquatic passage. Within the 13% Area, there were no crossings constructed or reconstructed in 2007 by the FS.

Measure 13 requires permanent stream crossings to be designed to handle a minimum 50-year flood event. While no new crossings were constructed or reconstructed in 2007, some crossings are currently being proposed for culvert replacement and will be designed to handle a minimum of a 50-year flow.

Measure 14 addresses temporary crossings. No temporary crossings were constructed in 2007.

Measure 15 pertains to roads built by private oil and gas developers. One 2000' long road was constructed to access a deep well. This road was located on Babylon Hill away from any water resources. Thus, the implementation of Measure 15 was not an issue in 2007.

Measure 16 did not pertain in 2007 as there were no instances where federally listed threatened and endangered species were known to occur in areas proposed for development by private oil and gas operators. Thus, the U.S. Fish and Wildlife Service and private oil and gas operators did not need notification.

Measure 17 pertaining to silt fences was implemented and maintained for the most part, as noted by oil and gas administrators within the 13% Area. The one thing observed was the lack of maintenance of silt fences.

Measure 18 - See measure 7 under Appendix C results.

Measure 19 includes direction for the Wild and Scenic River Corridor of the Allegheny River. Four points are outlined, none of which occurred in 2007.

Measure 20 outlines four points that require further consultation with the U.S. Fish and Wildlife Service, should they occur. The first point, proposed installation and operation of boat launches on the Allegheny River, did not occur in 2007. Secondly, for any activities that do not follow the above measures in the 13% Area, consultation is required. With the exception of the refusal by a private oil and gas operator to surface a road with a high quality stone as mentioned above, no other consultation was required. Point three states further consultation is required if anticipated activities will result in more sediment delivery to the Allegheny River than projected and analyzed in the Forest BA. During 2007, there were no Forest cases of this occurring within the 13% Area. However, several oil and gas developments were proposed, but have yet to be implemented. The fourth point speaks to the increase in zebra mussel introduction risk. This is addressed in Item #11 above (FPO-39) of this report, with the result being that risk increased slightly based on a much smaller sample size. The U.S. Fish and Wildlife Service will be notified.

Conclusions - Where applicable, conservation measures were implemented in 2007. Educational material was distributed and updated; surfacing of sections of an ATV trail was accomplished with a higher quality stone to reduce sedimentation to streams; effectiveness of timber harvest buffers near streams showed the buffers used in the 1986 Forest Plan to be

effective at preventing sediment from going into streams; sediment from private oil and gas roads, and lack of silt fence maintenance were noted as concerns within the 13% Area.

The objective of screening 500 boats and conducting 1,000 trailer counts was not met in this first year of implementation. Based on the information collected from the numbers that were accomplished, the risk of zebra mussel introduction to the Allegheny Reservoir was just slightly higher than the average over a three-year period when more extensive surveys occurred, but still very low.

Many measures did not need implementing simply because the activities they address did not occur within the 13% Area, or weren't yet applicable (e.g., contingency plan development for zebra mussels with other agencies, herbicide buffer application, construction of stream crossings including temporary crossings, activities within the Wild and Scenic River Corridor, construction of boat launches on the Allegheny River funded or authorized by the FS). The FS did send a letter to the U.S. Fish and Wildlife Service concerning the refusal of a private oil and gas operator to surface a road within 300' of a stream with limestone to reduce runoff.

Recommendations - Continue with implementation of the conservation measures outlined in Appendix C of the Forest BA, and with the conservation measures outlined in the U.S. Fish and Wildlife Service concurrence letter of 1/30/2007. These are to be implemented in order to protect the endangered mussels and to maintain a "May affect, not likely to adversely affect" determination from the U.S. Fish and Wildlife Service under the Endangered Species Act.

17. SMO #17 Have Federally Listed Plants been Identified?

(Forest Plan, p 51) – from Table 15. Strategic Monitoring Information.

Resource Area	Monitoring Question	Monitoring Frequency	Evaluation Frequency	Precision/Reliability
Wildlife, Fish and Sensitive Plant Habitat	If federally listed plants have been identified, what conservation measures are being implemented?	Annual	Annual	A/B

Protocol – NRIS (Natural Resource Information System) TESP (Threatened, Endangered, Sensitive Plants and invasive species (all taxa) is the corporate database for inventory and mapping data for Federally Threatened or Endangered, or Regional Forester Sensitive plant species. The protocol for collecting data is contained in: USDA-FS 2005. Threatened, Endangered, Sensitive Plants Element Occurrence Field Guide. Washington D.C., 39 pp.

Results - Project level surveys for federally listed plants small whorled pogonia (*Isotria medeoloides*) and northeastern bulrush (*Scripus ancistrochaetus*) were conducted in areas proposed for management activities such as, but not limited to, timber harvest, road construction, and wildlife opening construction, on approximately 5,000 acres in FY 2007. No federally listed plants were documented.

Conclusions - If federally listed plants are documented, follow Forest Plan direction in the 2600 Section (p 84). Conservation measures found in the biological evaluation would also apply.

Recommendations – Continue to survey and report annually.

Evaluation of Other Annual Items for Tables 13, 14, 15

Of the 74 monitoring items in the Forest Plan, 17 items are evaluated at annual intervals and 57 items are evaluated at intervals longer than one year. If you have an interest in any particular monitoring question that is not addressed in this report, please feel free to contact the Forest Monitoring Coordinator. These items will be included in the Annual Monitoring Report when the year for evaluation occurs. For example, an item to be evaluated every three years will appear in the 2009 Monitoring Report, two years after the first Annual 2007 Monitoring Report.

Other Monitoring to Report from FY 2007

Two additional items of interest were selected to report on in FY 2007. These were deer densities and maximum opening size from even-aged management. Both of these items are collected annually, but normally evaluated on a five year cycle.

FPO #30 Deer Densities

(Forest Plan, p 46) - from Table 14. Achievement of Forest Plan Objectives.

Forest Plan Objective	Monitoring Question	Monitoring Frequency	Evaluation Frequency	Precision/Reliability
Manage white-tailed deer populations at 10 to 20 deer per square mile to sustain herbaceous and woody species diversity across the landscape.	What is the deer density across the landscape?	Annual	5 years	B

Protocol – Deer density is estimated using the spring pellet group transect methodology developed by Dr. deCalesta. Basically, the protocol includes five, one-mile transects per site. The biologist records the number of pellet groups within a six foot radius plot taken at 100 foot intervals along the five miles of transect. Browsing intensity is recorded at 200 foot intervals (every other plot).

Results – The deer density on the Kinzua Quality Deer Cooperative (KQDC) is provided in Table 17 and 18. The deer density on the portion of the Forest outside of the KQDC is provided in Table 19.

Table 17. Deer Density on the KQDC over Six Years.

Year	2002	2003	2004	2005	2006	2007
Deer density	27.3	28.7	24.7	14.4	11.6	12.7
DMAP coupons on KQDC	0	2,960	2,960	700	300	300
DMAP coupons on remaining portion of ANF	0	9,290	9,290	6,300	5,000	0
Total DMAP coupons	0	12,250	12,250	7,000	5,300	300

As in 2005 and 2006, average deer density in 2007 was significantly lower ($P < 0.01$) than in 2002-2004. Density increased slightly but not significantly in 2007, and average density in 2007 was not significantly different from 2005. The trend of significant reduction in deer density from 2002 to 2005 halted in 2006. In 2007, the number of DMAP licenses made available to hunters substantially decreased. The DMAP program has been a major contributor to the reduction in the deer population by providing licenses for increasing the harvest of antlerless deer.

Average over-winter deer density varied considerably among the 26 sites (Table 18), ranging from a low of 3.4 deer per square mile to a high of 22.0 deer per square mile.

Table 18. Deer/square mile per Site on the KQDC in 2007.

Site	2007 Deer/square mile
A	7.1
B	14.4
C	14.0
D	18.9
E	3.4
F	22.0
G	7.0
H	3.9
I	16.4
J	11.6
K	20.3
L	7.0
M	18.1
N	3.8
O	13.9
P	12.5
Q	13.4
R	5.4
S	8.0
T	6.0
U	20.1
V	11.0
W	12.4
X	21.2
Y	10.0
Z	14.9
Mean*	12.7 + 1.2

*Confidence interval is mean plus or minus interval with 95% confidence of containing true mean value.

Table 19. Deer Density on NFS Lands Outside of the KQDC in 2007.

Location (Forest road)	Deer per square mile
150B	10.4
631	21.9
222	18.0
184	12.6
329	7.0
180/525	7.1
216	10.6
Laurel Mill	4.1
Brush Hollow	20.2
217	10.3
Average	12.2

On NFS lands not included in the KQDC, 10 pellet group transects are conducted each year. In 2005, the average deer density was estimated to be 26.6 deer per square mile. In 2006, the average density dropped to 15.4 deer per square mile. In 2007, the density declined to 12.2 deer per square mile. These less intensive samples over most of the Forest correspond closely with the intensive sampling occurring on the KQDC. However, not all 10 sample sites are in the same location each year.

Conclusions – Deer densities are within the range specified in the Forest Plan (10 to 20 deer per square mile). Continue to monitor deer populations and implement DMAP when necessary.

MLO #03 Maximum Opening Size from Even-aged Management

(Forest Plan, p 39) – from Table 13. Minimum Legally Required Monitoring Items.

Action, effect or resource to be managed	Monitoring Question	Monitoring Frequency	Evaluation Frequency	Precision/Reliability
Maximum opening size from even-aged management and the need for change (36 CFR 219.12(k)5(iii) and (36 CFR 219.27 (d)(2))	What is the maximum size opening from even-aged management? Is there a need to change the standard?	Annual	5 years	A/B

Maximum Temporary Opening Size by Management Area

Protocol – Vegetation harvests sold for even-aged regeneration harvests were compiled from vegetation databases, including TIM and FACTS databases. Timber sale maps were reviewed for final harvest areas to review adjacent shelterwood removal, clearcut, or two-aged harvest prescriptions to determine the maximum and minimum size of temporary openings by MA.

Results

Table 20. Size of Final Harvests by Management Area in Acres

Management Area	FY 2007 Accomplishments			Forest Plan Maximum Size specified for Management Area	
	Minimum Size	Maximum Size - scheduled, "Green" Treatments	Maximum Size - unscheduled, Salvage Treatments		Average Size
2.2	1	18	34	10	20
3.0	1	40	23	15	40
8.2	n/a	28	n/a	28	n/a

A temporary opening can be created through a final harvest silvicultural treatment, and is intended to be reoccupied by young trees. Temporary openings are dominated by trees and saplings less than 15 feet tall that, with time, will grow into a mature forest. The preceding table displays the minimum, maximum, and average size of areas sold for final harvest, which will result in temporary openings.

The size of temporary openings created through scheduled, or "green" harvests cannot exceed 40 acres, or 20 acres in MA 2.2, as specified in Forest Plan MA direction (USDA-FS, 2007a, p 68 & 111). Regional Forester approval is required to exceed these scheduled "green" temporary opening sizes. As can be seen from the preceding table, the size of "green" final harvests in timber sales conformed to MA direction. It should be noted that one 28-acre shelterwood removal sold fell in MA 3.0 under 1986 Forest Plan direction, and just within MA 8.2 under 2007 Forest Plan direction. This stand was sold via a decision made under 1986 Forest Plan direction, and is therefore consistent with MA direction.

Unscheduled salvage treatments occur in response to catastrophic forest damage from wind, insects, or disease. Salvage regeneration treatments are designed to regenerate heavily damaged or declining stands in order to restore fully stocked forested stands to these sites. In these cases, the size of the damaged area was determined by the disturbance event which, in turn, determined the size of the subsequent silvicultural treatment. Salvage temporary openings created in response to catastrophic damage are not constrained in size (USDA-FS, 2007a, p 68). As can be seen in the table, the maximum size of salvage final harvests sold in response to damaging agents was 34 acres, and occurred in MA 2.2. In total, three areas were sold for salvage final harvest in MA 2.2 during FY 2007 that exceeded 20 acres. All three of these treatments were prescribed to restore healthy, fully stocked, forested conditions to these areas.

Conclusion and Recommendations – The size of final harvest units in timber sales awarded in FY 2007 conformed to MA direction. There is no need identified to change these items. Continue monitoring the size of temporary openings created through shelterwood removals, clearcuts, or two-aged harvests to ensure Forest Plan standards and guidelines are met.

Summary Recommendations

The Allegheny NF has completed only a partial of year of monitoring and evaluation on Forest Plan implementation. It is too early to identify problems because several more years of data will be needed to establish trends. None of the items monitored in 2007 identified a need to amend the Forest Plan. But, this first year of monitoring and evaluation did lead to recommendations to improve on implementation. These recommendations are summarized below by monitoring item and description, results, and recommendations. These recommendations include actions such as changing the method used, amount of accomplishment, or level of monitoring.

Table 21. 2007 Monitoring Recommendations for Change

Item/ Guide#	Description	Results	Recommendation
4. MLO-21	Prescriptions & Effects	Good, overall.	For each district – 1) Use both relative density and basal areas in silvicultural prescriptions; 2) Data for check of marking should be collected before and after marking before harvest; and 3) Increase marking check frequency.
5. MLO-23	Effects of Management Practices	Sufficient #'s of green (live) reserve trees left.	For each district – Use same protocol to collect leave tree marking data using size classes in the Forest Plan.
9. FPO-17	Maintain or Create Age Class Diversity	802 acres of even-aged harvest sold -5 year trend is decreasing.	Increase to 1,400+ acres annually, as continued low level of accomplishment will not achieve landscape level desired structural classes.
10. FPO-29	Enhance Terrestrial Wildlife Habitat	811 acres in 2007.	Increase enhancement acres to minimum objective of 1,200 acres as continued low level of accomplishment will compromise long term goals.
11. FPO-39	Prevent Introduction of Zebra Mussels	None found, but risk assessment from boat surveys is slightly higher.	Complete zebra mussel surveys for 500 boat and 1,000 trailers at launches in 2008; this is minimum level identified by US Fish & Wildlife Service.
13. FPO-45	Acres treated to increase understory diversity	2,315 acres	Increase acreage treated to minimum objective level of 3,000 acres – understory desired conditions will not be fully met at present level.
15. SMO-10&11	Indiana Bat Conservation Measures	10 harvest units measured in 2007; snag retention #'s are below objectives.	1) Place higher emphasis on retaining snags when marking. 2) Measure 20 green timber harvest units in 2008; minimum level identified by US Fish & Wildlife Service.

