STATE OF CONNECTICUT

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Bureau of Natural Resources
Division of Forestry

FOREST MANAGEMENT PLAN
2009 through 2018

Tunxis State Forest
Hartland Hollow Block

Approvals:

07-01-09

Christopher Martin, Director Date
Division of Forestry

7/7/09

WilliamHyatt, Acting Bureau Chief Date
Bureau of Natural Resources

Author: David Irvin, Forester 1
Peter Picone, Wildlife Biologist
In consultation with: Cal Innes, Rec. Mgr.
Don Mysling, Fisheries Bio.

CT. Department of Environmental Protection
Division of Forestry
79 Elm Street, 6th Floor
Hartford, CT 06106

Bureau of Natural Resources
DIVISION OF FORESTRY

Memorandum 6/11/2009

To: Bill Hyatt, Acting Bureau Chief, BNR
From: Christopher Martin, Director/State Forester CMM
RE: 10-year Management Plan – Naugatuck State Forest, Quillinan Reservoir Block

The State Forest System is managed by the staff of the Division of Forestry's State Lands Management Program. Each of the six field foresters is responsible for the management of the vegetation found on the State Forest Lands assigned to them. The foundations for that management work are 10-year plans that are developed for approximately 10% of the forester's assigned area each year. Foresters also manage Wildlife Management areas and State Park lands, as requested by the Wildlife and State Parks Divisions, respectively.

These plans set the management strategy for DEP foresters to follow as they work to maintain dynamic ecosystems by increasing species diversity and age class diversity in forest stands. The management of state-owned lands aims to be responsive to the social and economic needs of Connecticut's population, but to provide for those needs in a responsible, sustainable manner. The management of state-owned forested lands by the Division of Forestry first and foremost seeks to improve the health and vigor of the forest-respecting water quality, wildlife needs, and recreational opportunities while maintaining a sustainable timber and fuelwood resource.

A statically reliable sample inventory covering all stands within the forest is completed at ten-year intervals. When combined with map analysis, this inventory information helps to identify forest stands that would benefit from active management versus forest stands that would serve better when left in a natural condition. For those stands that would benefit from management, the information gained from the stand inventory allows the forester to develop and prioritize potential stand treatments geared to meet the primary objective of improved forest health and vigor. The forester then holds discussions with biologists, environmental analysts, recreation managers, and local interest groups to establish management objectives from a broader, ecosystem-wide perspective. The forester structures the final vegetation management plan for the next 10-year period, proposing improvement work to provide for as many of those objectives as possible. The improvement work mimics the natural processes of forest development and change, but in small increments, thereby minimizing the chance of widespread change via natural catastrophe.

(OVER)

Forestry Division
Bureau of Natural Resources
Connecticut Department of Environmental Protection

Tunxis State Forest—Hartland Hollow Block
Ten-Year Forest Management Plan, FY 2008-FY 2018

*Field Review (Signature and Date Required; Comments on next page or attach separate blank sheet or letterhead)**

Fisheries [signature] 02/04/08 comments in memo @ end of plan.

Wildlife [signature] 12/07

State Parks [signature] 1/30/08 [signature] 2/4/08

Support Services [signature] 2/5/08

District Forestry Supervisor [signature] 4-2-08

State Staff Review

Fisheries ______

Wildlife ______

State Parks ______

Law Enforcement ______

Forestry/State Lands Management Supervisor ______

State Forester [signature]

Other

Barkhamsted Conservation Commission [signature], chair

Hartland Conservation Commission ✓ sent, no comments or signature provided.

MDC ✓ (see letter, end of plan)

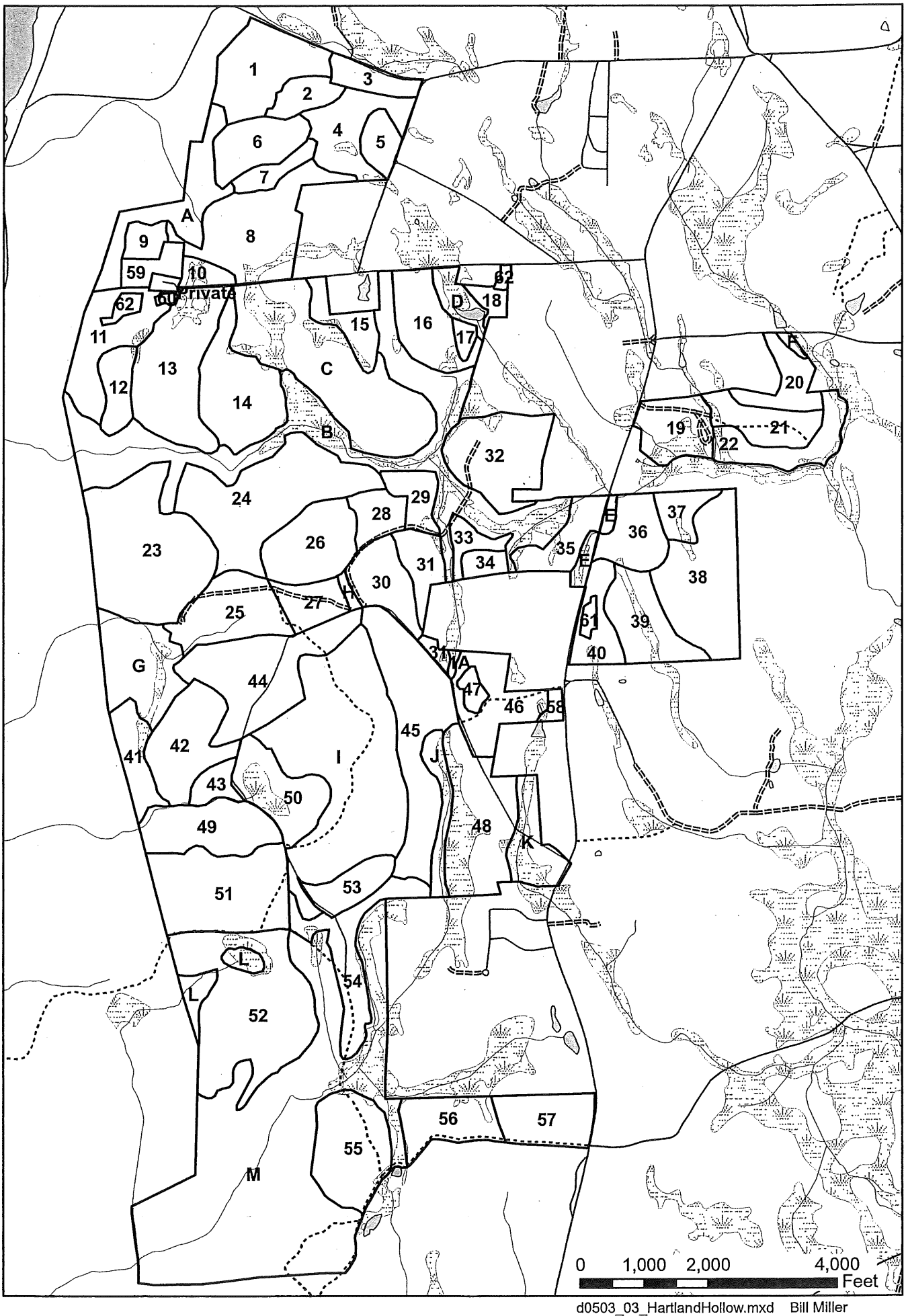
CFPA (Conn. Forest and Park Association) Ann Colson TRAIL CONSERVATION COORDINATOR 5/16/08

Staff Project Review

To be reviewed by: Assistant Commissioner ( ) Parks & Rec. ( ) Planning & Development ( ) Property Management ( ) Division Services ( ) Law Enforcement ( ) Wildlife ( ) Water Resources ( ) Forestry ( ) Fisheries ( ) Other(s) ( )

DISTRICT	HARTFORD
Discipline: BOR, Peaples Forest Unit See attached. -end of plan Initials: C Innes Date: 1/26/08	Discipline: Initials: Date:
Discipline: INLAND FISHERIES SEE ENCLOSED MEMO @ END OF PLAN Initials: Date: 02/04/08	Discipline: Initials: Date:
Discipline: Wildlife Comments are in the plan. Initials: CMP Date: 11/20/07	Discipline: Initials: Date:
Discipline: CFPA Consideration of Tunxis Trail appreciated. Please notify us when timber harvesting is scheduled to begin, and whether any section of the trail will be closed during the operation. Initials: ate. Date: 5/16/08	Discipline: Initials: Date:

d050303 Hartland Hollow Block 06/21/2007



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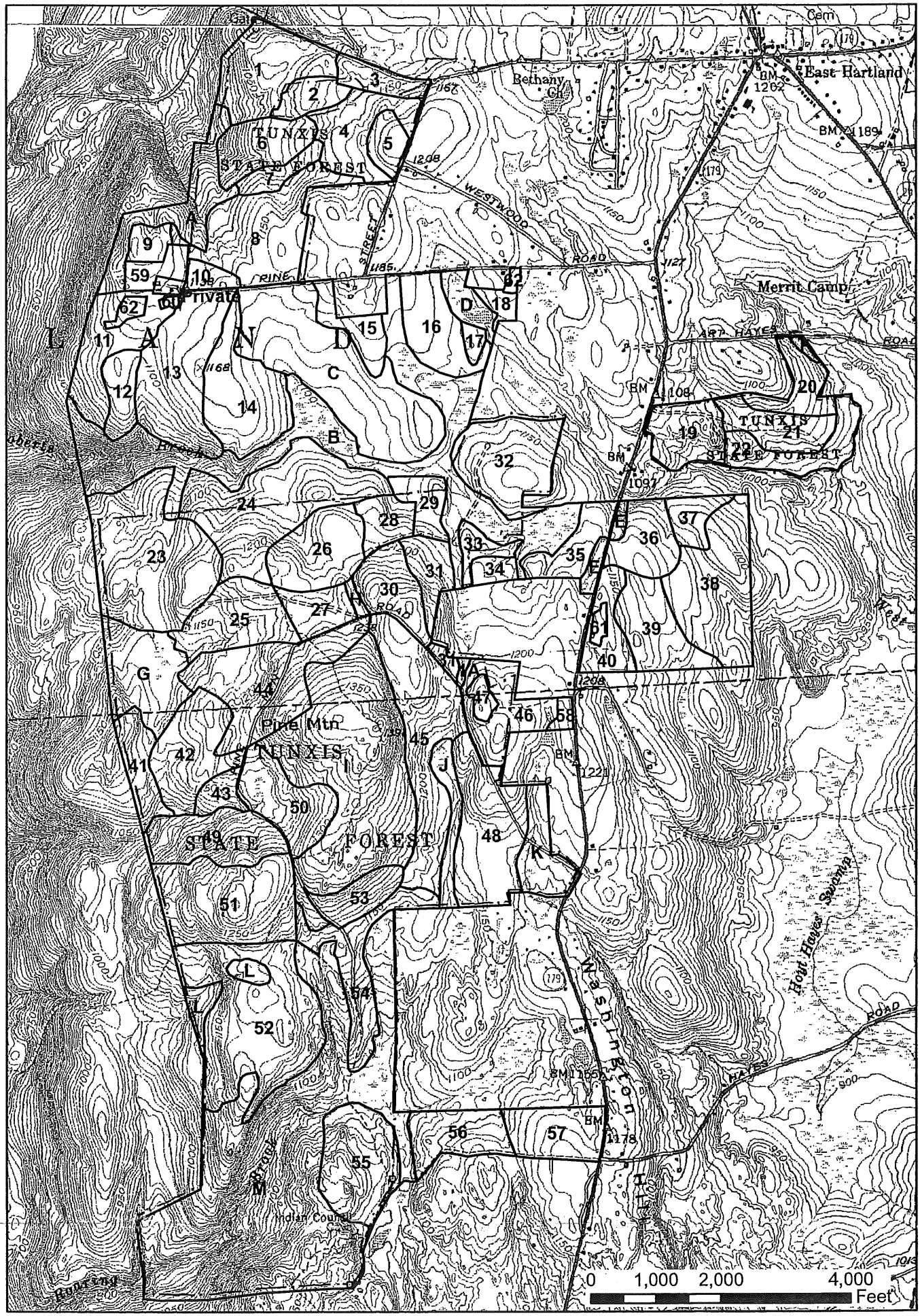

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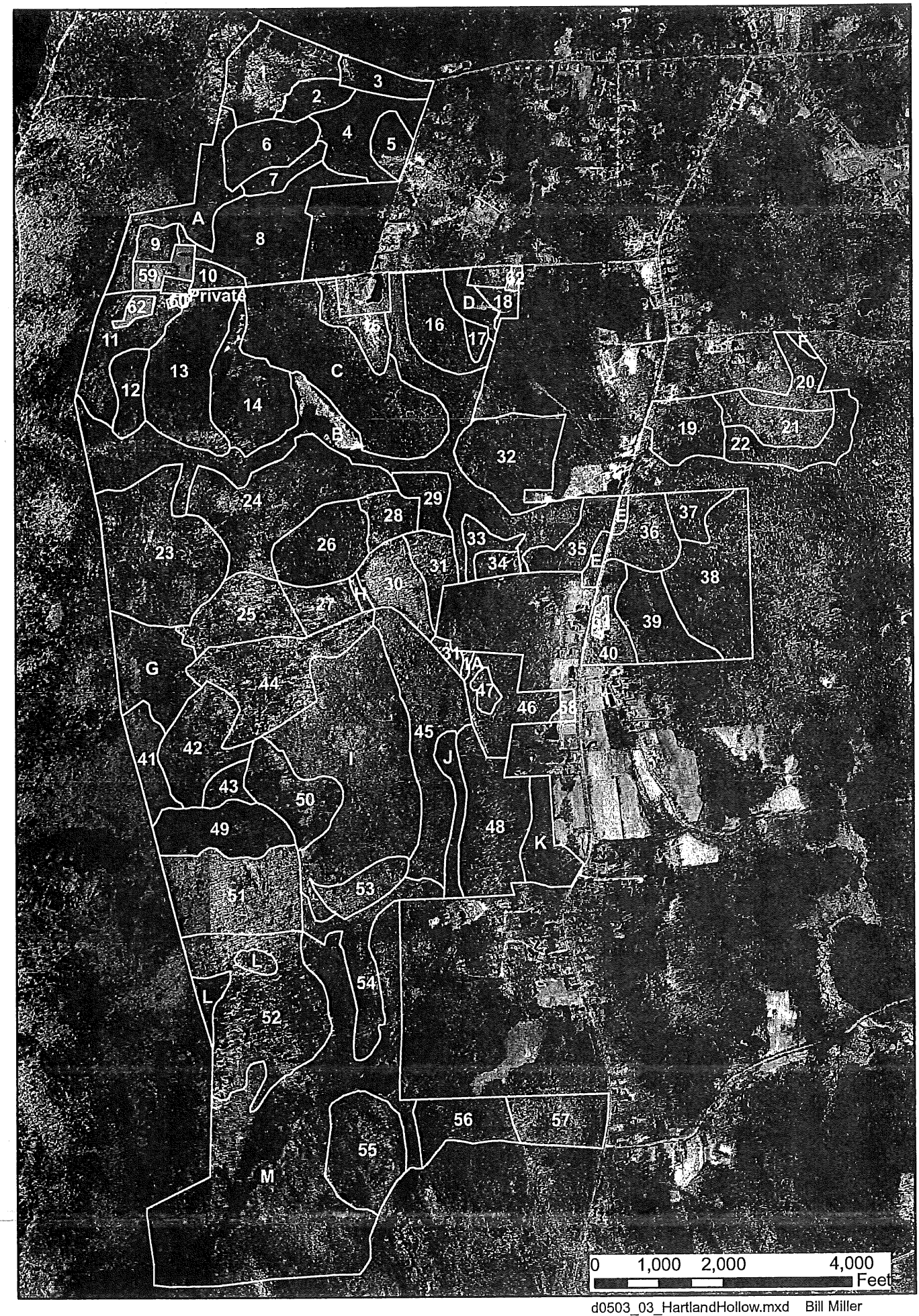

d0503_03_HartlandHollow.mxd Bill Miller

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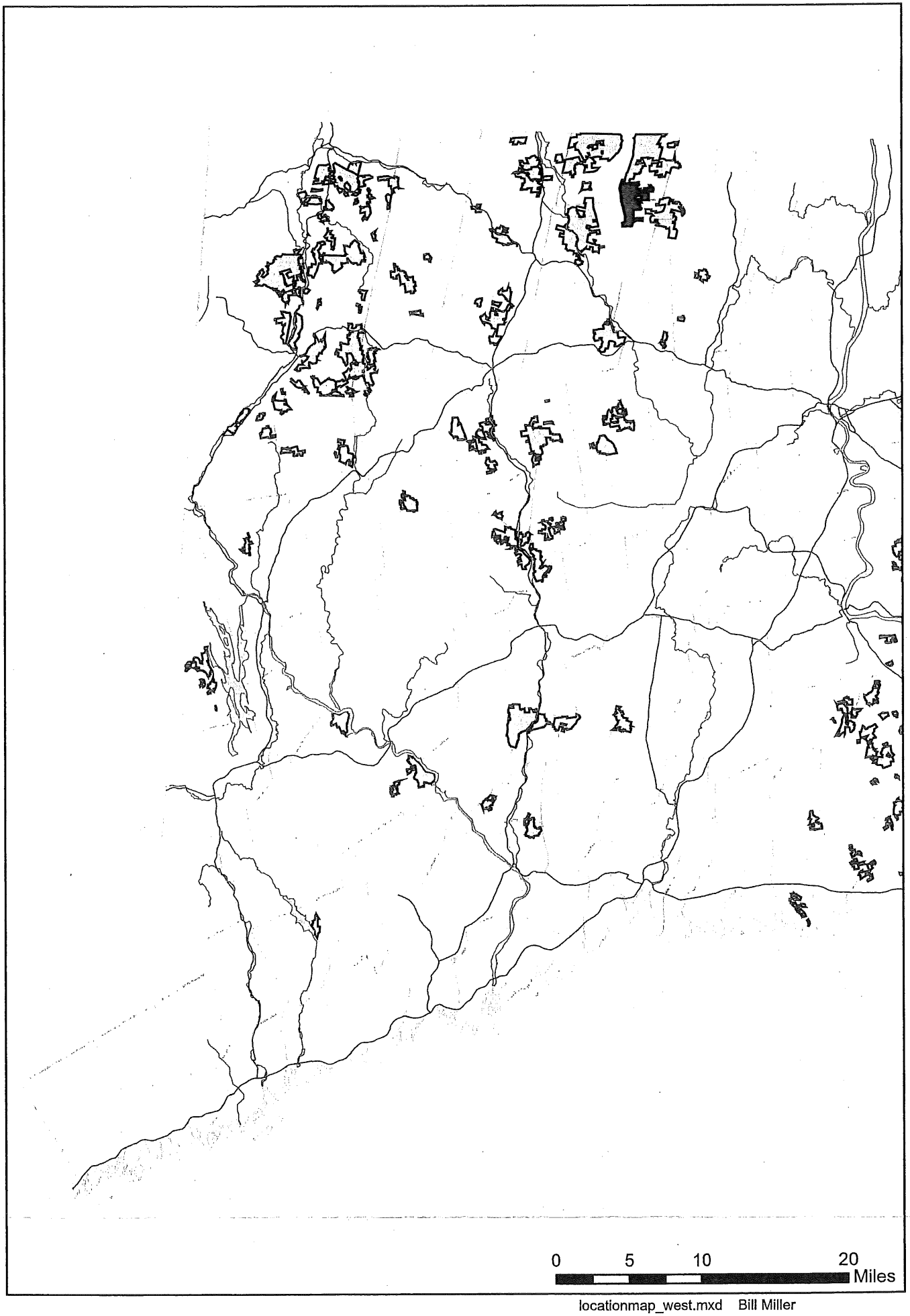

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General Description of Management Area

The Hartland Hollow Block is one of three blocks of Tunxis State Forest. It is the southern block that lies east of the Barkhamsted Reservoir. It directly abuts the East Hartland Block on the north side (3,457 acres; see management plan FY 2003). Old Route 20/Walnut Hill Road divides the two blocks where they abut one another on the western side, and East Hartland Center is roughly a divider between the blocks. Essentially, the Hartland Hollow Block abuts only the MDC on two of its sides: The entire 4-mile western boundary of the block is shared with the MDC, as is the entire 1-1/2-mile south boundary along Sunrise Avenue.

The block is divided nearly evenly between the towns of Hartland and Barkhamsted, with the northern half lying in Hartland and the southern half in Barkhamsted. The name "Hartland Hollow" is a reference to the former village that once lay in the hollow between East Hartland and West Hartland. Like the village of Barkhamsted, Hartland Hollow was flooded by the Barkhamsted Reservoir and no longer exists.

The block included in this plan closely shares history and management goals with the East Hartland Block, and is intended to be a companion piece with objectives complementary to the FY 2003 East Hartland plan. In future years, it is suggested that the two contiguous blocks east of the reservoir be merged into one management unit with prescriptions under a single plan. This could be done without changing all the new stand numbers established in the two current management plans.

A. HISTORY

The first land purchases for Tunxis State Forest occurred in 1923. The area had seen early farm abandonment (before the 1850s) and forest was already abundant. But while some areas were stocked with timber already near maturity, other parts of Tunxis had recently been heavily logged. Large areas in what is now known as the Hartland Hollow Block had been burned over.

The abundance of high-bush blueberry early in the 20th Century at Tunxis led to a demand for blueberry-picking so great that the Connecticut Park and Forest Commission charged 50 cents per day for permits to regulate picking. More history of Tunxis State Forest is detailed in the East Hartland Block management plan (FY 2002-2012).

Forest management during the Twentieth Century can be described as "sporadic". Only in recent years have efforts been made to focus on clear management systems in each stand, either even-aged or uneven-aged management. Very little emphasis on regeneration cutting seems to have occurred in the past, the greater emphasis being improvement cuttings and thinnings, or to simply "reduce stocking" of some species perceived as less desirable across a stand, such as hemlock. This has been changing in the past decade as foresters have attempted to complete follow-through of work in stands prescribed under the last management plan. No long-term management plan has been written for the Hartland Hollow Block since 1986. That plan's timeline expired in 1995.

Rotation age to be established for even-aged stands will be 100 years, with initial

rotations sometimes in excess of 125 years until all stands are under regular prescribed management. Cutting cycles for uneven-aged stands will be 25 years, consistent with the previous management plan approved for the East Hartland Block. This will be discussed further under "F. Vegetative Condition" later in this plan.

B. ACCESS

Acres:
Estimated total acres in block: 2,269
Managed Forest: 1,535
Non-managed Forest: 635
Wetlands: 73
(open swamps, or swamps with a partial canopy of trees)
Open Land (Fields): 25
Open water (ponds, lakes, not open swamps or marshes): 1

Present Access: (Areas to be managed)
251 acres in 12 stands are accessible by a **DOT maintained state road**

- *Route 179*-- 6,100 feet of frontage

280 acres of stands are accessible by **town roads**:

- 33 acres in 2 stands, *Pine Street*-- 1,600 feet of frontage
- 247 acres in 11 stands, *Sunset Road*—5,400 feet of frontage

Note that no useful frontage for access is likely on Rengerman Hill Road, but it may be possible in the future to access approximately 39 acres from this road instead of Route 179; *Rengerman Hill Road*—350 feet of frontage.

868 acres of stands are accessible from **DEP forest roads**:

- 576 acres, accessed directly from *Pine Mountain Road* -- 2 miles of usable road through state forest.
- 116 acres from the *Pine Mountain SPUR Road*—4,000 feet through state forest.
- 176 acres from a secondary spur road to be upgraded off Pine Mountain Road. This new road will be known as *Roberts Spur Road* (see "Maintenance/Improvements" section below).

Note that even the acres accessed via the spur roads above eventually go to Pine Mountain Road, so in reality, 868 acres (56% of managed forest in the block) are accessed from Pine Mountain Road.

136 acres of stands accessible from shared access roads with the MDC:

- 89 acres in 5 stands, *Old Route 20*—2,800 feet of frontage
- 47 acres in 2 stands, *Sunrise Avenue*—4,800 feet frontage, but only 2,900 feet of usable road.

Old Route 20 serves as the boundary of the Hartland Hollow Block on the

north side (separating block from the East Hartland Block) and Sunrise Avenue is the southern boundary of the state forest.

In the above listings, there is overlap, as some stands are accessible from more than one road and more than one type of road. In some cases, a single timber harvest will require access from two different roads simultaneously. In determining the above figures, each stand was categorized with the road most likely to be used for primary access.

Gates:

Pine Mountain Road is gated. The gate is closed during winter, usually at first significant snowfall or at end of fall hunting season. It is reopened in spring, approximately May 1, for public access. This gate was constructed from an old flag post and may be replaced by a standard DEP gate. Note that in order to make this work worthwhile, the gate has to be carefully and thoroughly blocked on either end to prevent traffic from driving around the gate. The current gate is not standard, but unlike many of the standard DEP gates at Tunxis, it has been working and has not been vandalized.

There is also a wooden post gate for access to fields off Sunset Road that is closed year-round. When this road is upgraded for access to the fields and to extract forest products from adjacent stands, a new DEP gate should be installed there.

A new gate was installed in 2003 on Old Route 20 to reduce problems in that area with partying, dumping and vandalism. This gate blocks vehicle access to both Old Route 20 and Emmons Grove Road on the East Hartland Block side of the road. This gate should remain permanently closed to vehicular traffic. It can be used by DEP and MDC personnel, as well as by cordwood cutters, logging contractors or by special permit (such as hunters with disabilities). A small public parking area is to be constructed near the Old Route 20 gate for hikers and hunters. This will be built as a cooperative effort between the People State Forest Unit of State Parks and DEP Support Services. There is also an MDC gate west of the DEP Old Route 20 gate, located at the MDC property line. This gate does not in any way access DEP land and DEP personnel have no need to gain access.

Note that as of this writing, the DEP gate on Old Route 20 is nonfunctional due to vandalism and priority should be given to immediate repair or replacement of this gate.

There is an MDC gate on Sunrise Avenue at the southern boundary of the Hartland Hollow Block (the MDC may know this road as Pine Hill Road). At present, DEP has a key to this gate and permission to access state land through this gate for the purpose of extracting forest products. However, MDC will be notified in advance for any use of the road for that purpose.

Maintenance/Improvements:

The Hartland Hollow Block is unusual in that there is only one primary state forest road for accessing most of the managed acres. Other stands are accessed from town roads or one state highway. Pine Mountain Road and the Spur Road wind through the heart of this block of contiguous forest and their condition are central to the continued management of the block. Drainage structures, many of which had been buried and hidden for years, were re-excavated and opened just several years prior to this plan and should now be maintained by cleaning out the culverts and catch basins annually. Side-ditching should also be maintained and the main road

and spur road re-graded and crowned at least every other year. The gate should always be closed during spring mud season and other particularly wet times, and the road edges should be mowed back by Support Services at least every three years.

Gravel for the roads will still be provided occasionally through timber sales, as part of environmental mitigation and contractual requirements to leave the road in as good or better condition than before each operation begins. A previously abandoned spur road just to the west of the current Pine Mountain Spur Road will be re-opened, lengthened and improved as part of one prescribed timber sale operation. It is anticipated that this road will be re-used for a number of operations in the future and for ease of referencing, will hereafter be referred to as the "Roberts Spur Road", named for the nearby Roberts Brook drainage area. This road can be of great value in accessing forest products in 4 stands, including stands 23, 24, 25, and 27 (191 acres). It may also assist in management of another 33 acres in stand 26.

Old Route 20 is a shared responsibility with the MDC, and any improvements to this road in the future should be with consent of MDC and sharing of resources. The road edges were recently cut back to reduce vegetative encroachment, and this should continue to occur on a regular basis. If millings from nearby D.O.T. highway work are ever available, it may be possible to get some delivered and placed on Old Route 20. This road was paved but the pavement is in advance stages of breaking up and is currently in poor shape. Drainage structures on Old Route 20 should be maintained on the same schedule as Pine Mountain Road and the Spur Road.

During the period of this 10-year plan, it may also be possible to re-pave this road and provide needed gravel on Pine Mountain Road through new funding sources or a Capital Improvements funding source.

A small 2-3 car parking lot needs constructing on the north side of Old Route 20 just outside the gate. The location has been discussed with State Parks and Support Services. This parking area is technically across the border onto the East Hartland Block.

Inaccessible Areas and Access Potential:

Most of the acreage in this block of Tunxis is contained within relatively continuous state forest. The majority of the areas listed as "Passive Management Areas", which will not be the focus of any harvest activity in the future, are listed in this category due to steep, inoperable terrain or wetlands that often prove to be unavoidable barriers to management and accessibility. DEP is not going to access these areas regardless of access improvements constructed.

There are a number of stands that could benefit from improved access. Stand 18 on Sunset Road is part of a recent acquisition which barely has road frontage and access, which is essentially along the edge of a neighbor's yard. This could impede forest management activities, but the only option available to improve the situation is acquisition of a neighboring lot to the east. This is addressed in more detail in "G. Specific Acquisition Desires" later in the plan.

There is an old roadbed on the south side of Sunset Road that goes southwesterly through Stand 13 to the series of fields. This road may be improved to access both forest management activities in stands 11,12, and 13 and maintenance of the fields at the end of Sunset Road.

Stands 19-22 (old Compartment 17) barely have road frontage and access for silvicultural operations, from either Route 179 or Rengerman Hill Road, is questionable. There are very narrow points of entry for access and landing construction, although it is more likely on Route

179. Any acquisitions to enlarge this compartment and provide new road frontage could dramatically improve access. Possibilities are limited due to locations of brooks and wetlands and home construction around the compartment. Increased access through land acquisitions along 179 is probably impossible due to recent home construction, but it may be possible to acquire more land east of the existing parcel off Rengerman Hill Road or Pederson Road to improve at least some access.

Another possibility is to acquire additional land between Compartment 17 and a new 150-acre acquisition just to the south (stands 36-40), to connect the parcels. Collectively, these are the only two parcels of land in the block that lie east of 179, and they would be more useful for wildlife habitat and probably more practical for management if they were connected. This will not make an easy access situation for Compartment 17, however, as any access from the south means building a bridge to cross the West Branch of Salmon Brook.

Stands 36-40 need a forest products road constructed for a short distance to at least one landing along Route 179 for future management, but this can be done as part of operations as they are prescribed.

During the scope of this 10-year plan, no operations are prescribed in stands 19-22 (Comp. 17). Most of both areas (stands 19-22, stands 36-40) on the east side of Route 179 will not be operated in the next 10-year period, which provides some lead time for more land acquisition and access improvement. Specific parcels of land of interest are outlined in part G, already referenced above.

Stand 55 is not easily accessed in any direction. This stand can be accessed via Pine Mountain Road to the north, but only by crossing Roaring Brook and one of its tributaries. To access it from the MDC's Sunrise Avenue would entail re-establishing the road to the east where it is currently flooded by beaver activity and unusable. This stand is also not scheduled to be harvested during the 10-year period of this plan.

There are no major needs for new forest products roads in the block, other than re-establishment and lengthening of the second spur road (Roberts Spur Road) to access specific stands. Most access into stands will be via temporary skidder or forwarder trails.

Rights-of-Way:

There are no known easements or rights-of-ways at this block of forest. Parcels originally acquired from the MDC have deed restrictions requiring park and forest use only, and not for other "commercial" purposes.

Boundaries:

Nearly 100% of boundaries for the block have been re-marked between 2001 and 2003 and will be marked again approximately every 8 years according to S.O.P. (most boundaries due for re-marking in approximately 2009 and 2017, twice during the term of this 10-year plan). Some of these boundaries had not been clearly identified for several decades prior to the work, and the southwestern corner of the block involved extensive clearing of mountain laurel for passage and sightline. There are an estimated 113,836 linear feet or 21.6 miles of boundaries for the Hartland Hollow Block, with 3.2 miles of roadside tagging only and another 18.4 miles of interior painted line. Of the total boundary distance, 9 miles or 42% is either shared boundary with the MDC or borders a public road. The remaining 58% of boundaries border miscellaneous

private land.

There are currently few significant or noteworthy boundary encroachment problems in this block. One encroachment in a recent acquisition involves unauthorized use of an old forest road for approximately 100 yards from the adjacent Case property (Sweet Wind Farm). The abutter uses the roadway to access a gravel pile on private land. The road should be used only by Special Use Permit or completely re-routed onto private land. This encroachment was addressed by warning letter to the abutter involved and turned over to DEP Law Enforcement and Land Acquisition and Management during 2006. As of this writing, the abutter appears to be complying with DEP by constructing a new road on the private side of the common boundary.

Survey assistance is needed and has been requested to complete approximately 1,500 feet of boundary line and to replace two adjacent property corner pins, # 388 and 389. This area is in the northeastern quarter of the block, just west of the intersection of Rengerman Hill Road and Route 179. This is the only section of boundary in the entire block that has insufficient information and field evidence to allow marking by DEP.

There have been four significant acquisitions that added acreage to the block since approximately 2000. These areas (Beeman property, Silkey property, Mudano/Coombs parcels, and Salmon Partners properties) were all surveyed and marked following purchase, and former obsolete boundary marks eradicated.

C. SPECIAL USE AREAS

Lakes and Ponds:

There are no significant lakes or ponds maintained for recreational uses. There is a pond, approximately one acre in size, on the south side of Sunset Road in East Hartland (estimated 700 feet off the town road), in the recently acquired Silkey parcel. The pond has been labeled "Sunset Pond" for the purpose of this plan. This pond was constructed for fishing when privately owned. No specific plans are known to stock this pond or list it for fishing, nor are there likely to be plans to advertise or improve access to the pond for public use. It could prove to be a liability to the department, and that claim was made by Forestry when commenting on the parcel to Land Acquisition and Management during original scoring and consideration of the Silkey land for purchase. But most people will never know the pond exists if it is not advertised.

DEP also owns a portion of a pond on the 10-acre Beeman acquisition on the west side of Route 179 in Barkhamsted, adjacent to the field. The property boundary crosses the field and pond.

Streams and Rivers:

There are only two significant streams in the Hartland Hollow Block. Roberts Brook and Roaring Brook both originate in marshes within the state forest and flow westerly into the Barkhamsted Reservoir. The origination and entire flow of both brooks occur in protected buffer areas of the block in which harvesting is not prescribed, and neither brook will have to be crossed during this 10-year period. The only exception ever expected is that Roaring Brook may have to be crossed via bridge to access stand 55 in future years, after 2018.

The corridors and banks of both brooks occur on steep, rocky ledge which provide scenic value, including numerous chutes and waterfalls. Roberts Brook flows for approximately 3,000

feet westerly through state land, and Roaring Brook flows for approximately 4,400 feet southwesterly through the middle of a 236-acre protected area that will be allowed to grow on its own to "Old Growth". One state Threatened species, the northern spring salamander, is known to occur in Roaring Brook (see "Critical Habitat" later in the plan).

The West Branch of Salmon Brook occurs near stands 19-22 (old Compartment 17), but not within the state land. Two brooks forming the south and east state property boundaries of this compartment meet at the southeast corner of stand 22 to form the West Branch.

Cultural Sites:

There are no known sites or structures of historical and cultural significance within this block of forest. The Hartland Hollow Block is virtually all undeveloped forest.

There is an old wooden silo on state property at the edge of the fields off Sunset Road. The structure is deteriorating and occurs barely on state land adjacent to the abutting inholding owned by the Blouins. It is in close proximity to two homes and should be considered a future liability to be reviewed for razing.

Recreation and Scenic Sites:

Recreation today is limited primarily to hiking on the Tunxis Trail or forest roads, snowshoeing or cross-country skiing, mountain biking, horseback riding on Pine Mountain Road, bird-watching, and regulated hunting.

There are no developed recreational areas in the block. Most of Tunxis represents a large area of contiguous native forest that is actively managed, but uninterrupted by recreational developments or enhancements of an artificial nature.

The Tunxis Trail, a Blue-blazed Trail, runs for 6.1 miles (according to mileage information available in the *Connecticut Walk Book, 60th Anniversary Edition*) through Hartland Hollow. An estimated 12,600 feet or 2.4 miles of this trail occurs in protected areas designated as "unmanaged". One highlight of the trail's course is the summit of Pine Mountain in the central portion of the block near Pine Mountain Road. The elevation at the peak is just under 1,400', the highest point in the Hartland Hollow Block, and it provides the best vista of the surrounding countryside in this block of forest. The trail also highlights other scenic areas of the block, particularly the rough and steep natural corridors of Roaring Brook and Roberts Brook.

Except where the Blue-blazed Tunxis Trail occurs on state forest roads, mountain biking is not permitted on the trail by the Connecticut Forest and Park Association (CFPA), which maintains all Blue-blazed Trails through volunteer trail managers. As in all state forests, ATVs are not permitted, except by special permit for harvest of a forest product or for hunters with disabilities. Under no circumstances are unregistered motorized vehicles allowed.

The Pine Mountain Cross-Country Ski Touring Center has previously maintained miles of ski trails in the Hartland Hollow Block, at times without DEP's consent and knowledge of the extent of maintenance. This would still be permitted today through a Special Use License renewed biannually. As of this writing, the most recent Special Use License expired March 31, 2004 and there has been no effort to renew it (see part D, "Unauthorized or Illegal Activity" for more discussion).

Critical Habitat:

There are three Connecticut State Listed Species identified in the block by DEP's EGIC and Wildlife Division, but none considered "Endangered" by the state or federal government (see memos included in this plan). The **northern spring salamander** *(Gyrinophilus porphyriticus)*, a state **Threatened** species, has been found in Roaring Brook. This salamander requires cold, clean, well-oxygenated springs or brooks along heavily forested rocky ravines. The Wildlife Division has recommended a 100' buffer for Roaring Brook and minimal stream crossings, which will not be a problem as no harvesting will occur in the vicinity of this brook. It is also possible that the salamander occurs in Roberts Brook to the north, as this stream shares Roaring Brook's character of steep, rocky ravines and ledge banks. The salamander is known to occur in Hurricane Brook in the East Hartland Block of Tunxis further north, and it is only logical that Roberts Brook (which lies between the two known occurrences) could support the species. Both Roaring Brook and Roberts Brook are in areas left out of active management, to follow nature's course and grow into late successional areas. Based on the specific recommendations by the Wildlife Division, no cutting will occur within 100 feet of these streams at any time (although the buffer is usually much greater than that), and neither will be crossed with logging equipment, with one possible exception in future years beyond the 10 years of this management plan.

A north-south oriented drainage that partially feeds Roaring Brook will also be in a buffer strip from active management, and no cutting will occur within 50 feet of that stream. Any activity in the vicinity that could increase runoff or erosion into the brooks will be carefully monitored. Tunxis State Forest is the only state property where this salamander species has been documented, and maintaining the integrity of their narrow zones of habitat is important.

The second species is the **wood turtle** (*Glyptemys insculpta*), a state **Species of Special Concern**. This turtle was documented in one area near the beginning of Pine Mountain Road. Wood turtles require riparian habitats bordered by flood plains, woodlands or meadows. Summer habitat includes pastures, old fields, woodlands, power line cuts, and railroad beds adjacent to streams and rivers. They hibernate submerged in tangled tree roots along river banks or in deep pools from approximately November 1 to April 1. Wood turtles use areas up to 1,500 feet from the streams and rivers where they are found. The species will be protected if activity within 1,500 feet of streams are operated during their dormant period. The Wildlife Division later clarified by informal memo (to be included in this plan) that if operations avoid the immediate stream area, the species should not be adversely impacted. Therefore, stream crossings for perennial, intermittent, and ephemeral streams will be minimized and protective border strips will be maintained for all streams. The nature of the border strips will be determined on an individual case-by-case basis and will be in keeping with S.O.P. In general, this block of forest will be managed with a 100-foot no-cut buffer strip along any major perennial stream, 50 feet for intermittent streams (or direct drainages into Roaring and Roberts Brooks), and no more than 50% of the basal area will be removed within 50 feet of ephemeral flowages. All operators will also be required to be wary and protective of turtles spotted crossing Pine Mountain Road or other roads. Finally, the Wildlife Division will be tasked with purchasing or producing a "Turtle Crossing" sign for the beginning of Pine Mountain Road.

These measures should provide adequate protection. The wood turtle has declined due to loss of suitable habitat through development. The relatively isolated and occasional occurrence of logging equipment in a continuously forested environment should not adversely impact the

species as long as crucial streams and wetlands are protected.

The **saw-whet owl** *(Aegolius acadicus)*, a **Species of Special Concern**, is not specifically documented with the block of forest, but is known to occur in the East Hartland Block to the north. This species was not listed by EGIC, but was added by the DEP Wildlife Division as a concern in a later memo. Data on this species, including habitat requirements and limiting factors, is minimal, according to the Wildlife Division. The nocturnal bird is associated with coniferous forests near wetlands, and hunts along the edges of open parks, meadows and fields. The most likely habitat that matches this general description occurs in the central portion of the block off Pine Mountain Road and the Pine Mountain Spur Road, as mature conifer forests occur close to open wetlands and open fields on abutting private land. Previously, the Forestry and Wildlife Divisions cooperatively installed three saw-whet owl boxes in the East Hartland Block as recommended in that management plan. It is suggested that the same occur in the Hartland Hollow Block. The Wildlife Division is to construct up to three nesting boxes, and Forestry will assist in locating appropriate habitat in three different stands and assist in installation. The Wildlife Division shall field check the boxes once annually to determine use and relative success. Furthermore, any cavity trees 12" and up in diameter in conifer stands or within 150 feet of wetlands and watercourses throughout the block will be left standing during all timber harvests, unless such trees must be cut for a matter of safety.

Natural Areas:

There are no state-recognized Natural Area Preserves in the Hartland Hollow Block. But an estimated 31% of the block will be permanently left out of active management under this management plan. This equals approximately 709 acres, and includes not only forest, but wetlands and open water. Most of this acreage is inaccessible or inoperable, or otherwise provides some unique vegetative, topographic, scenic, or habitat character and provides more value for preservation than for active vegetation management. Those areas are discussed in more detail below in the section entitled "Old Forestland Management Sites".

Old Forestland Management Sites:

An estimated 709 acres (31%) will be left alone for wildlife, recreational or aesthetic qualities that have been recognized. These areas will be allowed to become "Old Growth" naturally, managed passively to develop late successional forest and habitat. The exception would be possible future hemlock salvage operations that could become necessary for public safety along a portion of the Blue Trail corridor. This would only occur upon consideration of a specific request by one of a number of appropriate authorities, including DEP, Connecticut Forest and Park Association (CFPA), or the towns of Hartland and Barkhamsted.

A summary of the specific natural areas labeled "A" through "M" on the base map are provided on a special overlay entitled, "Passive Management Zones". There are 13 distinct areas, varying in size from just one acre to well over 200 acres. The three primary areas, from north to south, include:

- A protective corridor for Roberts Brook and associated wetlands (both open marsh and wooded swamp), "B" and "C" on the map, totaling 221 acres.
- Scenic and inoperable ridgeline corridor for the Tunxis Trail across Pine Mountain, area "I", 124 acres. Approximately 4,000 feet of the Blue-blazed

Trail occur in this protected zone.

- Roaring Brook protective corridor and "mountain laurel preserve", area "M", 236 acres. This area includes perhaps the densest and oldest series of mountain laurel thickets known at Tunxis.

Research Areas:

There are only two active research sites in this area of Tunxis. The first is a Blue Ribbon plot in Hartland known as the "Perry Hemlocks", established in 1931. The objective of all Blue Ribbon plots is to study long-term forest change. Today the Ct. Agricultural Experiment Station (CAES) maintains the research area and generally visits to take measurements and statistics once every 10 years. The 2000 visit was of particular interest because DEP Forestry arranged a thinning within the plot for the first time, as part of a neighboring timber sale (W-253).

The Perry Hemlocks is 0.5 acre, with a 1-chain buffer area with the same treatment surrounding the plot. It is located in the very northwest corner of the Hartland Hollow Block, near the MDC boundary, and just on the south side of Old Route 20 (stand 1). The stand of hemlocks was believed to be established on abandoned pasture in about 1850. The stand was already 80 years old when crop-tree released during first establishment of the study area in 1931. The area was one of two sites that were subjects of a scientific paper by Dr. Jeffrey Ward and Dr. David M. Smith in 2000 entitled "Dynamics of Connecticut Hemlock Stands". Dr. Ward is presently the contact regarding this research plot.

There is also a Forest Health Monitoring plot off Pine Mountain Road in Barkhamsted, approximately 2.5 miles down the road, off the west side in stand 54. CAES has been visiting this plot annually since 1983 to measure the diameters and evaluate health of 15 tagged trees. Management is prescribed for stand 54 within the next 10 years, and prior to any operation, CAES will be consulted regarding any concerns or preferences they may have for harvesting in or near the plot. Dr. Victoria Smith is presently the contact regarding issues with this study area.

D. EXTENSIVE AREAS OF CONCERN

Trails and Signs:

As previously mentioned under "Recreation and Scenic Sites", Tunxis Trail, a Connecticut Blue-blazed Trail maintained by CFPA volunteers, runs for over 6 miles through the Hartland Hollow Block. Nearly 2-1/2 miles of this trail occurs in Old Forestland/Passive Management zones and will never be affected by timber harvesting (this includes areas where stand boundaries stop 100 feet from the trail in order to exclude the trail in narrow, unmanaged corridors). Included is one 4,100-foot section over Pine Mountain. This is the only authorized trail recognized in the block. Walking is also common on Pine Mountain Road and the Spur Road.

As a matter of Standard Operating Procedures (S.O.P.) during operations prescribed in this plan, no more than 50% of the basal area will be cut within 100 feet of the Tunxis Trail (unless salvage is taking place for public safety) and no slash will be left within 25 feet.

The Tunxis Trail only passes *through* three stands designated for treatment during the 10-year period covered by this plan: Stands 25, 44, and 54. The trail also passes along the outside edge (but not through the harvest activity) of five other stands: 8, 9, 11, 24, and 53 (see stand

map). In the area of the latter 5 stands, harvest activity may be visible from the trail, approximately 100 feet away, but the trail itself should not be touched or impacted. Note that the map indicates that the trail passes through stand 8 and not exactly on the outside edge at the stand boundary. However, the operation will stop short of the trail to reduce impact and hazard. The eight stands combined should be managed within just 5 operations and/or operation plans, averaging one operation every two years during this management planning period. Operation plans for each of those areas will be sent to CFPA for review and comments, and informational signs and cautions signs will be placed along the trail wherever it enters harvest areas, or where a particular site poses a particular distinct hazard or point of interest.

According to both CFPA policy and State Park and Forest regulations, section 23-4-1 (l), Blue Trails are limited to hiking (foot traffic only) except where DEP blazed trails supporting other uses coincide.

Although it has been the normal standard in the past to post caution signs and not close stretches of Blue-blazed Trail during DEP harvest activity (previous preferences of CFPA), the Forestry Division will reserve the right to close sections of Tunxis Trail during harvests for public safety.

There is only one permanent sign at this block of forest. A wooden state forest shield sign stands at the entrance of Pine Mountain Road. Informational signs will generally be placed at landings, road frontage, as well as the aforementioned trail crossings of all operations under this plan. Any operations accessed from Pine Mountain Road will have caution signs posted at the entrance of the road near the gate.

CFPA is presumed to be responsible for placing signs along Tunxis Trail in the Pine Mountain Area in late 2006 proclaiming that mountain biking and ATVs are not allowed on the Blue Trail. As of this writing, DEP plans to take no action either against the sign placement on state land or in active support. CFPA has a right to maintain their trails on state land as needed, which includes posting directional information and Association rules regarding use.

Wetlands:

There are an estimated 73 acres of open or nearly open swamps in the block, and another 170 acres of wooded swamp (both hardwood and hemlock, designated on the stand map by areas C, D, E, F, G, K, and L). In general, no wetland soils are included in active management, and no hardwood or hemlock swamps will be actively managed. Harvesting of forest products or felling of trees in such areas for forest or habitat management objectives will be done primarily near edges so that equipment will not enter and impact the soils.

Unauthorized or Illegal Activity:

Most unauthorized or illegal activity consists of use of ATVs and dirt bikes on state land. Complaints and evidence of this activity at Tunxis have increased dramatically within the last three years, although impacts are still not as severe as in many other state forests to the south. This activity is pursued by officers as much as time permits. Timber harvest contracting will be used to assist blocking illegal trails and making passage by ATVs difficult whenever possible. Dumping and vandalism are considerably less of a problem in this block than they are in the East Hartland Block.

An intact gate on Old Route 20 reduces partying down that road. A squatter camping on the south side of Old Route 20 was moved in 2005.

The Pine Mountain Ski Touring Center on Route 179 in Barkhamsted has traditionally used and maintained cross-country ski trails in the block. Technically, the owner has not charged the public for skiing on public land, but charges for rental of equipment and parking. However, the Center has not maintained a Special Use License with the state since 2004 and does not respond to communications regarding the matter. Therefore, the license to use and maintain trails through Tunxis has long expired and these trails can no longer be maintained in any way by the owners, including cutting vegetation and posting of signs for skiers. Snow conditions have not been conducive to skiing for any length of time for several years, but use of the trails, particularly maintenance during summer, will continue to be monitored closely.

In early 2007, the owner was sent a letter asking that he remove all signs from trails on state land associated with ski area. Even during the active Special Use License, signs were to be removed annually, and this has never happened. The owner was requested to remove the signs by summer 2007 or DEP staff will do so and dispose of the signs.

Another abutter was using an old tractor woods-road through a portion of the Salmon Partners acquisition on the west side of Route 179. The owner was told to cease use of the road without a Special Use License and has complied during 2006 by constructing a new tractor road on his side of the property boundary.

E. WILDLIFE HABITAT

Wildlife Considerations:

This block of Tunxis State Forest is believed to provide good forestland habitat for a variety of reptiles, amphibians, mammals and birds. This block of forest is just one piece of forested habitat embedded in an area that remains largely forested. It is adjacent to a large area of forest owned by the MDC, and to the west and north of this is another large block of state forest. Farming has historically been limited in this locale due to the rugged topography of the area and it has seen limited growth in residential development compared to other areas of the state. Initial evaluations indicated that providing another large piece of forest habitat that will be managed as forestland to perpetuity within a predominantly forested landscape may be this block's most valuable contribution to wildlife habitat on a landscape level. Additionally, value of this block for its opportunity to provide large areas of relatively unbroken forest and closed canopy conditions may outweigh benefits that could be produced with large-scale even-aged management producing early successional habitat. A second apparently beneficial characteristic to preserve is the block's high naturally-occurring percentage of conifer forest compared to other state forests and regions of Connecticut forests in general. Other forests in different areas of the landscape may be more suited to producing higher percentages of early successional habitat, as well as active management with most emphasis on hardwoods, than Tunxis.

Wildlife habitat needs were taken into account by the Forestry Division during the entire development of this plan and harvest schedule. Included were the following broad principles and guidelines, followed wherever possible in conjunction with silvicultural needs of each stand. These guidelines were developed based on past interaction and cooperation with wildlife biologists and were followed even prior to formal comments and recommendations by a DEP

Wildlife Biologist (those detailed recommendations follow in later sections):

1. Cluster even-aged areas as much as possible; likewise, cluster stands managed uneven-aged as much as possible to increase usefulness to wildlife and minimize fragmentation of habitat types. Use of the management systems are roughly half-and-half, as in the East Hartland Block previously, with a little more than half the acreage to be managed even-aged. Even-aged regeneration cuts will provide early successional habitat, while uneven-aged operations will improve vertical stratification and provide smaller gaps to diversify the understory vegetation.
2. Cluster unmanaged/Old Forestland acres into large areas as much as possible. Total area left out of management equals 31% of the block, a significant portion of the acreage.
3. Preserve a strong conifer component for wildlife, something that is difficult in many of Connecticut's hardwood-predominated forests. This means managing to maintain hemlock in spite of invasive insect concerns, and to maintain white pine and Norway spruce plantations where they occur. Ideal percentage is typically 15% conifer cover. Fully two-thirds of the managed area is stocked with a noteworthy conifer component, mostly mixed stands, and 18.6% of managed forest considered stocked in pure conifer stands.
4. Create coarse woody material (CWM) as part of contractor harvest operations.
5. Provide one 15" dbh or larger cavity tree per acre and leave all cavity trees within 100' of wetland or riparian areas. Leave smaller cavity trees (usually pole-size red maple) for flying squirrels. Also leave one potential 15" or larger den tree per acre where possible.
6. Leave three snags/acre 12" dbh or larger and leave all snags within 100' of wetland/riparian areas and along edge of clearcuts. These guidelines followed only when not interfering with logger safety and OSHA regulations.
7. Leave some cavity trees cut and on the ground for animals that use downed hollow logs, when numbers of naturally-occurring cavities are adequate to allow the practice.
8. Despite the low timber value, it is acceptable to manage for beech on even-aged and uneven-aged basis for hard mast diversity and to replace acorns should oak be lost to Ramorum blight in the future.
9. Provide adequate protection or management measures in critical habitat zones for endangered, threatened, or special concern species known to occur in the vicinity (see details in "Critical Habitat", part C of this plan).
10. Encourage winter food sources and look for them and note occurrence in inventory and management (i.e. winterberry). Always open and release eastern redcedar where it occurs.
11. Due to limited grassland in the block, maintain any field where accessible with Ag agreements or DEP personnel, and clearcut around fields wherever possible to improve usefulness of the area for wildlife.

Existing Diversity:

At the time the block was initially evaluated for management, the following traditional diversity objectives were sought for wildlife benefits:

- 60% of forest in sawtimber with nearly closed canopy
- 20% in pole-size trees

- 8-20% in seedling-sapling (early succession) trees
- 5% in permanent herbaceous openings, ideally
- 10% in "old growth" or unmanaged forest
- No more than 85% hardwood forest, with at least 15% conifer

The block will easily meet or already exceeds some of these guidelines, including percentage in sawtimber, percentage in "old growth" and area in conifer cover. Permanent herbaceous openings are a greater challenge and the pole and seedling-sapling guidelines take time to achieve through continuous active management.

Existing current habitat diversity based on cover types is shown below:

*Present distributions (**total** acres of block, not just managed):*

% of block in forest cover: 95.6%

% of forested acres in pure conifer forest: 14.3% (324 acres)

% of forested acres in evenly mixed conifer/deciduous: 36.4% (825 acres)

% of forested acres in deciduous: 40% (907 acres, including significant mountain laurel)

(Note: above 3 categories do not add up to 100% because miscellaneous small parcels with forest cover are primarily classified as wetlands and not included. The categories below may total slightly more than 100% due to rounding of numbers.)

% sapling in total acreage: 0.18%

% pole: 0.26%

% mature sawtimber: 67%

% mix sawtimber-pole: 22.7%

% mix sawtimber-sapling: 6.6%

% mix pole-sapling: 0.57%

% permanent open field (herbaceous cover): 1.1%

% wetland: 3.2% (includes open swamps, beaver marshes, partial canopy swamps)

% open water: 0.04% (ponds)

% not actively managed (including wetlands, open water): 31.2%

% open nonfragmented forest: With the exception of the Rengerman Hill Road stands (83 acres or 3.7%), the entire block can be considered contiguous and nonfragmented except partially by roads and inholdings along the outer boundaries on the east side. It is possible to travel through the entire block west of Route 179 without encountering any maintained town or state roads, from north to south.

Investment in Habitat Improvement:

There have been no special wildlife habitat management areas or investment in special projects in recent years at this block. The Wildlife Division has expressed interest in maintaining the fields at the end of Sunset Road, improving access to those areas, and coordinating Forestry activities in adjacent stands to maximize usefulness of the area by providing early successional vegetation in close proximity to the permanent herbaceous openings. There has been interest in doing the same around the smaller field on the east side of Route 179 in part of the Salmon Partners acquisition. The forest management in these areas will be closely coordinated with the Wildlife Division, as these small areas provide habitat opportunities that are unique in the block.

The work plan outlined for the next ten years was slightly modified in consultation with the Wildlife Division to include stands around the fields for more immediate effects of wildlife benefits in the vicinity. Federal money may be available for maintenance of the fields or clearing vegetation in surrounding stands that cannot be harvested through commercial timber harvesting.

The Wildlife Division is also expected to install saw-whet owl boxes, as was previously done in the East Hartland Block. Forestry can assist in the placement and location of appropriate stands for habitat.

Log landings provide small areas of temporary openings in an area of mostly mature, closed-canopy forest. These areas can provide fruits of blackberries and raspberries, herbaceous vegetation and insects for food sources, and can sometimes be enlarged to accommodate wildlife habitat and foraging needs as requested by the Wildlife Division. Most log landings will be seeded with a conservation mix following abandonment, as necessary for erosion control and rapid re-vegetation.

Population Controls:

There is no known need for any site-specific population controls on wildlife at this time other than those achieved through the use of regulated hunting and trapping.

Deer browse pressure at this time does not seem to be a serious problem limiting regeneration as it is in many other parts of the state.

Problems created by beaver will be assessed and dealt with through use of the state lands trapping system unless site-specific conditions dictate otherwise.

Recreation –Based Wildlife:

There are no special hunting areas or limits on hunting. This area is open to all forms of legal regulated hunting as listed in the DEP Wildlife Division's Field Guide under "Tunxis State Forest", including firearms and archery deer, turkey and small game hunting. The area is open to trapping by permit holders during the regulated season under the state land trapping season. All hunting and trapping is done in accordance with state DEP regulations.

Landscape Context-Wildlife:

The regional context of a forested area is important when considering strategies for enhancing or protecting wildlife resources. The 2, 269 acres of the Hartland Hollow block, by its sheer size and location in the State of Connecticut provides habitat to a wide array of species assemblages. This predominately-forested block provides and should continue to provide, through scientific forest management practices, regional biodiversity and high quality ecological processes and services.

The Hartland Hollow Block of Tunxis State Forest is located in a section of Connecticut that is lightly developed and has a low human population as you can see in the University of Connecticut's Center for Landuse Education and Research data displayed in Exhibit 1 (*Appendix E*) for the towns of Hartland and Barkhamsted (University of Connecticut CLEAR, 2007). The towns of Hartland and Barkhamsted have experienced a generally slow rate of loss of forestland to development, compared to other towns closer to metropolitan areas (University of Connecticut CLEAR, 2007). Because of this light development, wildlife impacts due to forest fragmentation from roads and subdivisions is not presently as much a concern compared to more developed

parts of Connecticut.

The intelligent and scientific management of the forest resources of the 2,269 acres of the Hartland Hollow Block could have a positive effect on the biological diversity of the region. Wildlife species that require larger tracts of unfragmented forest are already benefiting from this sparsely developed and heavily forested region. Opportunities to enhance habitat conditions for listed species that require early successional habitat would be available, as well.

The management of vegetation could have profound effects on the quantity and quality of the wildlife resource. Maintaining a diverse, interconnected forested ecosystem with a variety of size and age classes is of great benefit to wildlife (Scanlon, 1992). An interspersion of specialized habitats within a maturing forest environment such as grasslands, shrublands, and young forest is an important consideration in maintaining wildlife species diversity.

Habitat Management Background Information:

Thirty-one percent (709 acres) of the forested acres will be left to grow without any significant active forest management during this ten-year plan. Deciding to leave these 709 acres in an inactive management condition is a management action/decision onto itself. Although there are not current wildlife populations in sole need of these inactive management areas, the decision to maintain these areas can provide future scientists potential study areas. Although no human-induced management will occur on these 709 acres, natural disturbances such as insect infestations, beaver activity (flooding/cutting), tornadoes, ice storms, hurricanes and fires can change the vegetation size classes and species composition over time.

The proposed uneven-aged, even-aged and two-aged forest management systems are valuable tools and will have positive effects on the quantity and quality of habitat and improving biodiversity.

Forest managers, working with wildlife biologists, can most effectively achieve desired wildlife habitat goals by manipulating forest size classes through forestry operations. Wildlife species that use sawtimber sized forested conditions will continue to thrive in this ten-year forest plan. Interior forest songbirds such as red-eyed vireos, wood thrush , pileated woodpeckers will thrive. Mammals such as black bear, porcupine and fisher will find good habitat conditions. Many of Connecticut's reptiles and amphibians will find most of the forest stands within the Hartland Hollow block with quality conditions for vernal pools, abundant large woody debris and few road-crossing hazards than in more developed parts of Connecticut.

Wildlife species that specialize in young, early successional forested areas currently have very limited habitat in the Hartland Hollow block. Species of special concern requiring young seedling/sapling forest conditions such as American woodcock, blue-winged warbler, and whippoorwill have limited nesting habitat. Grassland-dependent bird species such as the bobolink, savanna sparrow, American kestrel, and eastern meadowlark have no habitat or very limited habitat within the 2,269-acre Hartland Hollow Block area.

Habitat Management Actions:

1- Improve conditions for early successional habitat wildlife species such as ruffed grouse, American woodcock, chestnut-sided warbler, blue-winged warbler, prairie warbler, cottontail (Sylvilagus spp.), eastern towhee, and whippoorwill.
Stands 6, 7, 8, 9, 10, 11, 12, 13, and 14 would be good areas to increase young forested patches which are adjacent to existing fields/grasslands near Sunset Drive. Several patch cuts of 5 to 10

acres in size with all stems cut down to a 2-inch diameter should be created in this area to improve early successional forest habitat. A sustainable rotation of small clear cuts (5 to 10 acres) throughout the Hartland Hollow block in 7 to 10 year intervals should be planned, whenever feasible. Establish at least two patch cuts initially of 5 to 10 acres. Patch cuts are most valuable to early successional species in the 3rd year to the 10th year after establishment.

2- Thin forest edges to create soft edges adjacent to and adjoining existing fields/grassland area near Sunset Drive. This can be accomplished through aggressive cordwood cutting and/or creating patch cuts sharing a border/edge with the fields.

3- Opportunistically, group selection cuts should be made in mixed forest stands to promote white pine seedling establishment and development. Given the uncertainty of the continuing loss of eastern hemlock due to invasive non-native insect damage, creation of young dense white pine seedling/sapling stands is recommended to mitigate the loss of evergreen cover due to the eastern hemlock decline. Creating dense white pine seedling patches provides beneficial evergreen cover component that serves as predator avoidance cover for wildlife. Maintain and enhance existing white pine stands through thinnings, seed tree cuts, group selection cuts or other forest management strategies to increase quality patches of white pine throughout the Hartland Hollow forest block. Time forest management activities, whenever feasible, to coincide with good white pine seed crop years to improve seedling development and retention.

4- When log landings are planned, it would be beneficial to consider creating small patch cuts of 2 to 3 acres in size. Larger-than-usual log landings could serve as small herbaceous openings with increases in soft mast species such as Dewberry, Black Raspberry, and Blackberry. Bare soil and/or scarified areas from the logging equipment should be seeded with a conservation mix of grasses and red clover. These areas will help improve wild turkey poult foraging sites for insects, fruits and tender herbaceous plant material.

5- Daylighting patches of fruit producing shrubs that provide seasonal food sources can be accomplished with group selection cutting or individual tree harvesting. Fleshy fruit is a key food resource for both game and nongame wildlife (Martin et al. 1951). Fruit resources are important for fall migratory songbirds (Willson 1986) and for resident birds in winter (McCarty et al. 2002, Borgmann et al 2004, Whitehead 2003). Greenberg et al. (2007) has reported in a study in the Journal of Wildlife Management that land managers can enhance fruit availability for wildlife species by creating or maintaining young stands within forests.

6- Identify invasive non-native plants in each forest stand and develop management strategies to reduce or eliminate their threat to native flora. The identification of invasive non-native species during forest inventories could help in the planning efforts to identify and help curtail the expansion of the detrimental invasive non-natives throughout the forest block.

Wildlife--Discussion and Summary:

Through the collaborative efforts of the forester and wildlife biologist, science-based forest management strategies can be employed to improve the biodiversity and health of the forested areas included in the Hartland Hollow Block. The landscape-level forest management planning set forth in this document, as well as the tailoring of wildlife habitat needs in individualized forest operation plans to come, will ensure that wildlife habitat will be enhanced, protected and, in some cases, created. The overall health of the forest and wildlife resources will benefit.

F. VEGETATIVE CONDITION

1. **Forest Size Classes by Forest Type** (*Total* forested acres, not just managed acres)*

Type	Sapling	Pole	Sawtimber	Sawtimber - Sapling	Sawtimber - Pole	Pole-Sapling	TOTAL
Eastern White Pine	0	6	54	0	0	0	60
Eastern WP/Hemlock	0	0	126	0	48	0	174
Eastern Hemlock	0	0	354	0	91	0	445
WP/Red Oak/Ash	0	0	110	30	26	0	166
Northern Red Oak	0	0	298	79	37	0	414
Chestnut Oak/Black Oak/Scarlet Oak	0	0	0	0	244	0	244
Mixed Upland Hdwds.	0	0	96	0	8	0	104
Red Maple/Lowland	0	0	208	0	18	0	226
Maple/Beech/Birch	0	0	55	0	68	0	123
Black Cherry	0	0	0	0	39	13	52
Red Maple/Upland	0	0	32	40	47	0	119
Paper Birch	4	0	0	0	39	0	43
TOTAL	4	6	1,333	149	665	13	2,170

*NOTES: In a few cases above, typing of unmanaged acres is estimated based on observations in those areas. Typing is not as accurate as in managed acres due to lack of very detailed inventory data.

2. **Forest Type, Size Class, and Condition on Acres to be Managed By USFS Forest Cover Type**

(Includes all areas where work is due, and not just in next 10 years)

EASTERN WHITE PINE (103)—*4 stands*

Size Class	Leave Alone (Satisfactory)	THIN	REGENERATE Even-Aged*	Convert to Uneven-Aged	TOTAL
Sapling	0	0	0	0	0
Pole	6	0	0	0	6
Sapling-Sawtimber	0	0	0	0	0
Pole-Sawtimber	0	0	0	0	0
Sawtimber	0	3	0	51	54
TOTAL	6	3	0	51	60

* "Regenerate" column in tables include all phases of shelterwood cuts, even if final harvest is

not scheduled within the 10-year scope of this plan.

EASTERN WHITE PINE/EASTERN HEMLOCK (104)—*8 stands*

Size Class	Leave Alone (Satisfactory)	THIN	REGENERATE Even-Aged	Convert to Uneven-Aged	TOTAL
Sapling	0	0	0	0	0
Pole	0	0	0	0	0
Sapling-Sawtimber	0	0	0	0	0
Pole-Sawtimber	0	39	0	9	48
Sawtimber	29	49	48	0	126
TOTAL	29	88	48	9	174

EASTERN HEMLOCK (105)—*13 stands*

Size Class	Leave Alone (Satisfactory)	THIN	REGENERATE Even-Aged	Convert to Uneven-Aged	TOTAL
Sapling	0	0	0	0	0
Pole	0	0	0	0	0
Sapling-Sawtimber	0	0	0	0	0
Pole-Sawtimber	9	0	0	82	91
Sawtimber	23	52	31	184	290
TOTAL	32	52	31	266	381

EASTERN WHITE PINE/NORTHERN RED OAK/WHITE ASH (401)—*4 stands*

Size Class	Leave Alone (Satisfactory)	THIN	REGENERATE Even-Aged	Convert to Uneven-Aged	TOTAL
Sapling	0	0	0	0	0
Pole	0	0	0	0	0
Sapling-Sawtimber	0	0	0	30	30
Pole-Sawtimber	0	26	0	0	26
Sawtimber	84	0	0	26	110
TOTAL	84	26	0	56	166

NORTHERN RED OAK (505)—*10 stands*

Size Class	Leave Alone (Satisfactory)	THIN	REGENERATE Even-Aged	Convert to Uneven-Aged	TOTAL
Sapling	0	0	0	0	0
Pole	0	0	0	0	0
Sapling-Sawtimber	0	0	79	0	79
Pole-Sawtimber	0	15	0	22	37
Sawtimber	0	173	0	0	173
TOTAL	0	188	79	22	289

MIXED UPLAND HARDWOODS (520)—*3 stands*

Size Class	Leave Alone (Satisfactory)	THIN	REGENERATE Even-Aged	Convert to Uneven-Aged	TOTAL
Sapling	0	0	0	0	0
Pole	0	0	0	0	0
Sapling-Sawtimber	0	0	0	0	0
Pole-Sawtimber	0	0	0	8	8
Sawtimber	0	35	53	0	88
TOTAL	0	35	53	8	96

RED MAPLE/LOWLAND (708)—*2 stands*

Size Class	Leave Alone (Satisfactory)	THIN	REGENERATE Even-Aged	Convert to Uneven-Aged	TOTAL
Sapling	0	0	0	0	0
Pole	0	0	0	0	0
Sapling-Sawtimber	0	0	0	0	0
Pole-Sawtimber	0	0	18	0	18
Sawtimber	0	0	0	14	14
TOTAL	0	0	18	14	32

SUGAR MAPLE/BEECH/YELLOW BIRCH (801)—*2 stands*

Size Class	Leave Alone (Satisfactory)	THIN	REGENERATE Even-Aged	Convert to Uneven-Aged	TOTAL
Sapling	0	0	0	0	0
Pole	0	0	0	0	0
Sapling-Sawtimber	0	0	0	0	0
Pole-Sawtimber	0	0	0	68	68
Sawtimber	0	0	0	55	55
TOTAL	0	0	0	123	123

BLACK CHERRY (802)—*2 stands*

Size Class	Leave Alone (Satisfactory)	THIN	REGENERATE Even-Aged	Convert to Uneven-Aged	TOTAL
Sapling	0	0	0	0	0
Pole-Sapling	13	0	0	0	13
Sapling-Sawtimber	0	0	0	0	0
Pole-Sawtimber	0	0	0	39	39
Sawtimber	0	0	0	0	0
TOTAL	13	0	0	39	52

RED MAPLE/UPLAND (809)—*7 stands*

Size Class	Leave Alone (Satisfactory)	THIN	REGENERATE Even-Aged	Convert to Uneven-Aged	TOTAL
Sapling	0	0	0	0	0
Pole	0	0	0	0	0
Sapling-Sawtimber	40	0	0	0	40
Pole-Sawtimber	0	7	9	31	47
Sawtimber	7	0	0	25	32
TOTAL	47	7	9	56	119

PAPER BIRCH (902)—*2 stands*

Size Class	Leave Alone (Satisfactory)	THIN	REGENERATE Even-Aged	Convert to Uneven-Aged	TOTAL
Sapling	4	0	0	0	4
Pole	0	0	0	0	0
Sapling-Sawtimber	0	0	0	0	0
Pole-Sawtimber	0	0	39	0	39
Sawtimber	0	0	0	0	0
TOTAL	4	0	39	0	43

Management System Guidelines

Forest management at the Hartland Hollow Block of Tunxis will complement management outlined in the East Hartland Block just to the north. It will be a combination of systems, based on needs of each individual stand and diversity objectives. In general, uneven-aged management (through single-tree and group selection) will be used in shade tolerant northern hardwood types (and in those areas to be converted to that type) composed of beech-birch-maple and some degree of hemlock. Even-aged management (thinnings and regeneration cuts through multi-phase shelterwood cuts or clearcuts) will be used in stands dominated by oak species, to regenerate stands in areas of heavy laurel or in some stands that are already severely understocked with acceptable growing stock (AGS). Both systems can be used to regenerate hemlock and white pine, dependent upon the individual stand. In a couple cases, two-aged management will be utilized.

Even-aged areas will be managed on a 100-year rotation. Currently, 52% of managed forest in the block (29 stands, 801 acres) is to be managed even-aged. In the target rotation, an average of 10% of the even-aged areas are to be completely regenerated every 10 years, or currently about 80 acres. In keeping with that objective, the 10-year work schedule calls for 79 acres of final shelterwood harvests (based on shelterwoods already begun prior to plan). But an additional clearcutting of 70 more acres have been added to the work plan to enhance wildlife habitat needs in the area, after close consultation with the Wildlife Division.

Uneven-aged management was modified at the East Hartland Block to entail 25-year cutting cycles, instead of the usual 15-20 year periods, and this will also be utilized at the Hartland Hollow Block. This will mean slightly heavier cuts per operation but with less frequent disturbance. This also means growing larger trees (higher upper-limit diameter) and older trees (150-200 years), and possibly establishment of more than the minimum of three distinct age classes. A 25-year cycle means 40% of uneven-aged areas must be treated every 10 years instead of half as in a 20-year cycle. Since uneven-aged management will be practiced on a total of 26 stands (663 acres) or 43% of managed acres, the 10-year work schedule calls for work on 250 acres, or just under the 265 acres that would constitute 40% per decade.

Two-Aged management is only being used in two stands, totaling 71 acres or 5% of managed area. These will appear essentially as shelterwoods without a final harvest of the overstory and involve few or no intermediate cuts (harvest of the older of the two generations

approximately every 40 years, with some thinning in secondary generation possible at that time or in conjunction with convenient neighboring operations). Note that neither stand will be actively managed in this 10-year period due to higher priorities in other areas identified by inventory.

Understory Concerns:

Witchhazel and hobblebush is of some concern in the block, as these species can shade out regeneration.

Mountain laurel is more widespread and grows so densely in some areas of the block that growth of any regeneration is impossible or impractical. The largest, most mature, and densest thickets of laurel at Tunxis State Forest are believed to occur in this block, often covering multiple stands over large areas. Where it occurs at its densest, from Pine Mountain-west/southwest, the forest canopy is sparse for a few hundred acres, allowing sunlight to encourage laurel growth. This is believed to be due to a large area fire in approximately 1920, prior to state ownership. The scattered oak that survived the fire grew beyond its fire scars (hiding evidence in the future until the trees are cut and found to have little value, as was discovered in 2000), and canopy gaps between the survivors were taken over by re-sprouting mountain laurel already established in the understory. The only management possibilities in such areas for regeneration are either heavy shelterwood cuts with site preparation to break up the laurel cover to near ground level, or no management at all. Both options are practiced at the block.

The two final shelterwoods occurring in the 10 years of this plan (stands 30, 51) both occur in a formerly dense laurel cover at an area of early 20th Century burn. It is considered priority to regenerate these areas since the overstory is known to have little value and is therefore an unproductive use of growing space.

The option of not managing the area of thick laurel cover at all is selected for two primary nonmanaged stands, identified on the stand map as areas I and M. Area I is also set aside as an unmanaged area because of Pine Mountain ridge and Tunxis Trail scenic corridor, and area M serves the dual purpose of protecting Roaring Brook. In both cases, the soils are predominantly very unproductive and occur on ledge, and the difficulty of trying to actively manage these stands on the ground in very dense mountain laurel is not deemed worthwhile. The areas will be considered laurel preserves, although these preserves will not be as accessible for public interpretation as the laurel preserve at Nipmuck State Forest.

On the other hand, where beech is well-established, uneven-aged management was generally selected, since beech as a component of the northern hardwoods type is usually managed under that system. This is also a concession to the fact that beech, once established, is very difficult to remove in favor of even-aged regeneration of oak.

Forest Protection Concerns:

a. *Fire* – Although fire has dramatically changed composition and quality of stands and trees at Tunxis in past generations, damaging wildfires are infrequent at Tunxis today, and arson has been far less of a concern than at many other state properties. It is simply recommended that forest roads be properly maintained, particularly Pine Mountain Road and its associated spurs, which access most of the block. As in any state forest, harvest operations may be halted due to

fire hazard during severe drought, and any accessible stands of dying trees in actively managed stands will be salvaged to reduce fire hazard. All slash will be lopped to no higher than six feet (within 4 feet along roads and trails) and no slash will be left within 25 feet of any road or authorized trail.

The local Hartland and Barkhamsted Fire Departments should be informed of any new gates installed at Tunxis by DEP and provided with all lock combinations.

Prescribed fire will not be used to any degree at the block for forest regeneration purposes due to the large tracts of contiguous forest with insufficient firebreaks, and the high cost and difficulty of installing such breaks (due to topography in many areas), as well as a lack of desired access to some areas. Stands commonly have only one way in and out.

b. *Wind and Ice* -- Effects by severe weather events such as the Hurricane of 1938 and the ice storm in northern New England in 1998 cannot be predicted, but widespread damage can partially be prevented by maintaining a forest diverse in species, forest types, and age classes, and by maintaining adequate density of residuals, particularly in stands of shallow-rooted species and in shallow soils.

c. *Invasive Exotics* -- Most invasive plants of concern in more southerly areas of Connecticut do not yet occur at Tunxis. Japanese barberry and multiflora rose do occur in the old field stands and adjacent wetlands. Invasives are not yet posing significant concerns of inhibiting regeneration or other forest management objectives.

d. *Insects and Disease* --

1. Beech bark disease: Caused by a combination of the beech scale insect and *Nectria* fungus. Infected clusters of trees will be removed in favor of resistant individuals whenever possible.

2. Birch canker: Caused by the *Nectria* fungus, resulting in target-shaped stem cankers, often causing breakage or devaluing of the wood, and less often causing death. Trees with cankers will be removed whenever possible during operations and management of black birch will be based on the latest research for prevention of *Nectria* cankered birch.

3. Ash decline: Salvage of infected trees will occur whenever possible, but ash is not to be eradicated during operations. Ash on moister sites may show resistance and can remain standing. Multiple ash are recommended to be left where it occurs, as the species is dioecious, requiring different sex trees for reproduction. The possible future introduction of emerald ash borer may mean the end of white ash during the period of this plan.

4. Gypsy moth: Although no serious outbreak has occurred at Tunxis in years, the possibility exists of another population explosion. No further major outbreaks are predicted at this time due to control of the gypsy moth by an introduced fungal/virus combination.

5. Red pine scale and red pine adelgid: No longer of concern for future forest damage, as virtually all red pine at Tunxis has been salvaged.

6. Butternut canker: This disease is nearly wiping out butternut throughout its native range. It is caused by a fungus (*Sirococcus clavigignenti-juglandacearum*). Any healthy or living butternuts discovered in the block will be reported to the Agricultural Experiment Station in New Haven.

7. White pine weevil: This insect damages the terminal bud of young pine trees. Some protection is afforded by leaving a partial shade over the pine in areas where pine regeneration is an objective.

8. Hemlock woolly adelgid and hemlock scale: The combination of these two exotic insects are the most serious single concern to the health and longevity of a diverse forest at the block. Hemlock is the dominant species or an important associate in many areas of the block. It is also the most important native conifer providing forest and wildlife habitat diversity, and is important in regulating stream and wetland water temperature for fish and amphibians in many locations. As of this writing, the exotic hemlock elongate scale (*Fiorinia externa*) has gained firm and widespread coverage at Tunxis, even since inventory to collect field data for this management plan began. Most insect-related hemlock decline at Tunxis has been linked to scale, and not adelgid, based strictly on field observations. There are no effective controls for scale. Management will not focus on salvage or pre-salvage of hemlock except as necessary stand by stand. Hemlock is expected to persist on better quality, moist sites. No hemlock salvage will occur in wetland areas or areas not designated to be actively managed, unless a request is made that directly relates to a public safety concern.

The hemlock woolly adelgid (*Adelges tsugae*) was first documented in the block in 1997. It has since occurred in virtually all stands containing hemlock. Adelgid damage seems to be more severe closer to the Barkhamsted Reservoir on MDC land, and less in Tunxis. Most *mixed* stands should be managed to at least encourage other species in event of a major loss of hemlock. White pine and Norway spruce is to be preserved and managed to ensure a conifer component.

Some recent hope has been promised by introduction of exotic beetles at Tunxis and other forests in the vicinity that feed exclusively on woolly adelgid. The insects are reared by the Connecticut Agricultural Experiment Station. Additionally, the low temperatures that are more common in winter at Tunxis than in most of the state (below zero Fahrenheit) will kill the majority of adelgid, and the population takes time to rebound in the milder years.

Note that the operations specifically prescribed and scheduled in this plan are subject to revision depending upon damage by the hemlock scale and adelgid during the next decade. Focus may shift to salvage operations as necessary. This also applies to unanticipated attacks by other insect and disease organisms. Damaging agents of Ramorum blight and the Asian Longhorn Beetle are not known in the Connecticut natural environment yet, but could appear and command urgent attention at any time.

Landscape Context- Forestry

This block of Tunxis is part of a larger contiguous area of native forest that includes two other blocks of Tunxis, nearby Enders State Forest, MDC forest land, and even Granville State Forest and private forests across the state line in Massachusetts. Management in this block is consistent with management programs on the other DEP land, and as part of a new effort of cooperation between DEP and MDC, planning and management efforts will be shared with MDC forestry staff in order to make management programs more beneficial and uniform on a broader landscape basis.

In addition, the loss of hemlock on neighboring MDC land to large-scale adelgid/scale losses and widespread pre-salvage efforts (on a scale never pursued at Tunxis) accentuate the importance of maintaining hemlock stands at Tunxis, as a necessary component to the local ecosystem on a landscape level.

G. SPECIFIC ACQUISITION DESIRES

There is a short list of parcels of land that would be of value to this block of Tunxis. There are no acquisition possibilities along the entire western side of the block, since this is MDC property, and the contiguous nature of the block means there are few inholdings. The parcels that would contribute to the access or management objectives of the property lie along the east side of the block. The most noteworthy and beneficial acquisitions would be any that connect or improve access to the two easternmost compartments (the only two parcels of the block that lie east of Route 179). This is reflected on the map as stands 19-22 off Rengerman Hill Road, and stands 36-40 just south of there.

The following private properties should be of priority to acquire if available:

Town of Hartland--

1. Map 23, block 26, lot 3 (**103** acres, Pederson Road)
   Land of Loomis Institute
   This parcel will increase acreage and improve access to the old Rengerman Hill compartment (stands 19-22). Although access for forestry work would still mean installing a bridge over the West Branch of Salmon Brook, ownership of this parcel will increase road frontage for access. At present, there is so little road access that management of these stands is questionable. Any improvement could open up the entire acreage.
2. Map 23, block 26, lot 12 (**38** acres, Rengerman Hill Road/Pederson Road)
   Land of National Audubon Society
   Land Acquisition and Management has previously researched this parcel for purchase by DEP, but it was never acquired.
3. Map 23, block 26, lot 19B (**31** acres, Route 179)
   owner not disclosed
   This parcel would actually connect the two compartments (stands 19-22 to stands 36-40).

Town of Barkhamsted--

1. Map 17, block 30, lot 1 (**115.41** acres, Route 179)
   Land of Walsh or Stadler. Town assessor could not positively identify the owner or assessments of this parcel. The parcel constitutes a large inholding that would add manageable acres to the state forest, protect substantial wetlands, and prevent development.
2. Map 8, block 32, lot 11 (**155** acres, Route 179)
   Land of Legeyt Farm, LLC
   Parcel has been actively pursued by Land Acquisition in the past, but the effort was delayed due to contention within family members of the ownership. This piece will add substantial grassland to habitat of the block, and may nearly connect Enders and Tunxis State Forests for the first time.

Note that there are 4 more parcels in the town of Hartland that could be of value in the future, but all these properties have homes on them. Therefore, only if the owners were willing to subdivide and sell the state the undeveloped acres would the following be of value and interest to DEP:

Map 22, block 7, lot 10 (90 acres—Eric Raabe): Ownership of this parcel will protect many wetlands and eliminate the worst boundary problem at Hartland Hollow. At present, the boundaries in this area cannot be completed without surveying assistance

Map 22, block 7, lot 4 (13 acres—Wade and Holly Raabe): This piece has a nice field on it that could be of value to wildlife and includes an awkward "finger"-shaped inholding into state land.

Map 28, block 7, lot 5 (41 acres—Arlow Case): Inholding

Map 29, block 26, lot 1 (98.28 acres): Addition to existing property

H. PUBLIC INVOLVEMENT

A draft of this plan will be made available to the Hartland and Barkhamsted Conservation Commissions for review and comments. A presentation regarding this plan will also be offered to both town commissions and provided by the authoring forester, if requested, possibly in cooperation with a DEP Wildlife Biologist. The degree of harvesting activity scheduled for the Sunset Road area, and the nature of some of the operations, have potential to generate local controversy and opposition. Since the timing and many objectives of the work schedule in this area are to benefit wildlife habitat, the Wildlife Division will be requested to assist in any public informational sessions.

A copy will be provided for review and comments by the Connecticut Forest and Park Association (CFPA). The plan and associated maps will be shared with the Forestry staff of the abutting MDC land, in a renewed cooperative effort at broader management on a landscape level.

I. TEN YEAR GOALS

The primary goals for the next ten years under this management plan are improvement of the overall health and vigor of the forest, and providing for increased forest diversity in age classes, forest types and degrees of cover through the use of different management systems and a variety of harvest prescriptions. Diversity of cover means a diversity of wildlife habitat, and better protection from natural disasters, including insect and disease problems. A by-product of this management will be the removal and marketing of forest products for state, national and international markets on a sustainable basis in an average of 1-2 commercial operations annually.

Toward these goals, silvicultural operations in the next ten years will thin roughly half the even-aged areas identified by inventory as benefiting from a thinning, regenerate approximately 10% of the even-aged areas (number modified to slightly higher in the next 10 years to favor wildlife habitat goals) while preparing just under another 10% for future regeneration cuts, operate on 40% of uneven-aged areas, and prepare to salvage hemlock only as necessary. Operations in both even-aged and uneven-aged areas will strive to reduce the stocking in UGS (Unacceptable Growing Stock) and cull material. In all cases, stands with hemlock will be

managed to provide for a diversity of species in event of loss of this component. Nonnative species will be eliminated whenever possible, except in some conifer plantations that serve as wildlife cover.

Relating to these goals are other objectives:

- Road improvements and maintenance as necessary, particular to Pine Mountain Road and the Spur Roads.
- Maintain 100% of boundaries and resolve all encroachment concerns and unknown boundaries with help of surveyor or abutting land acquisition.
- Improve communications with the local community about the proposed active harvest program through signage, information at the Hartland town hall, and as deemed useful, through meetings, mail, or press releases. The Division of Forestry should be pro-active and accessible to the public.
- New acquisitions will also increase the size of the forest, further expanding this large, contiguous parcel, and protect more land from development in an area just beginning to feel development pressures from the Greater Hartford suburban sprawl.

J. WORK PLANS

Harvest Schedule, 2008-2018:

EVEN-AGED MANAGEMENT

1. **Thinning**

Stand #	Acres
11b	13
13*	49
25	31
41	18
42	35
43	7
53	15
56	22
TOTAL	*190*

* Stand 13 actually totals 52 acres, but 3 acres are included in a strip clearcut proposed by the Wildlife Division to serve as a corridor connecting the permanent fields to a clearcut in stand 14. Therefore, stand 13 also shows up in the "clearcut" table below.

Note also that stands 43 and 56 include thinning work in two size classes. Otherwise, all thinnings listed are strictly sawtimber thinnings. Stand 56 also includes some hemlock pre-salvage not listed elsewhere.

2. **Pre-Shelterwood Preparatory Cut (final thinning)**

Stand #	Acres
32	41

3. **Second Shelterwood (of 3)**

Stand #	Acres
44	53
48	48
TOTAL	*101*

4. **Final Harvest**

Stand #	Acres
51	58
30	21
TOTAL	*79*

5. **Overstory Removal**

Stand #	Acres
10	9

6. **Clearcut**

Stand #	Acres
11a	13
13	3
14	39
40*	9
TOTAL	*64*

* Only half the acreage will be clearcut. This stand is actually 18 acres, but a portion occurs in wetland soils.

UNEVEN-AGED MANAGEMENT

1. **Improvement Cut (Conversion)**

Stand #	Acres
8	51
9	8
12	14
24	68
26	33
57	25
TOTAL	*199*

6. **Selection Cut**

Stand #	Acres
36	21
54*	30
TOTAL	*51*

* Stand 54 includes white pine release as a major objective.

Stands listed in the tables above are shown in order by stand number, not order of priority. These were all highest priority stands identified by inventory. Timing of Second Shelterwoods and Final Harvests depend upon regeneration response. The two Second Shelterwoods will provide regeneration for the *next* 10-year period and the final cut will not occur until after the period of this plan.

Although some of the above even-aged regeneration terms have been used interchangeably, in this plan a "Clearcut" refers to a silvicultural clearcut, where essentially any and all stems 2" and up are cut and lopped or removed. An "Overstory Removal" is simply removal of all upper canopy trees where they still occur, usually of sawtimber size, releasing any secondary understory trees or advanced regeneration to more sunlight. These areas have not previously been part of a shelterwood series, and frequently have very irregular canopies and stocking due to past salvage cutting. "Final Harvest" is the final phase of shelterwoods, either a second or third harvest.

"Improvement Cuts" are conversions to uneven-aged management. Selection Cuts are regular harvests in areas already considered uneven-aged or nearly so, and can include both single-tree and group selection cutting.

TOTAL ACREAGE SCHEDULED FOR SILVICULTURAL TREATMENTS DURING THIS PLAN PERIOD: 734 (48% of managed acres, 32% of total acres; average of 73 acres per year to be treated)

Even-Aged Operations: 484 acres
Uneven-Aged Operations: 250 acres

OTHER WORK PLANS:

Road Maintenance:

- Edges of forest roads, primarily Pine Mountain Road and its spurs which serve as the backbone for forest access in the block, should be mowed by Support Services at least every 3-4 years or as needed. Roads included are Pell, East Pell, Hurricane Brook, Bragg Pond, Old Route 20, and Welch Road.
- Gravel will be provided by adjacent timber sales, as needed to access operations prescribed in this plan.
- The Peoples Parks unit or Support Services will clean out culverts and catch basins on the above roads as required, at least every 2-3 years.
- Side-ditching to be maintained at time of cutting edges of roads or re-grading.
- There should be an annual to biennial program of regular re-grading of Pine Mountain Road and its spur by Support Services.

Road Construction, Gates, and Signs:

- Repair/replace damaged gate on Old Route 20, as a priority project. This gate has been damaged beyond repair from vandalism for years. Replace Pine Mountain Road gate with standard DEP gate.
- Construct new spur road, to be known as the Roberts Spur Road, through timber sale

activity.

- Construct one small parking area on Old Route 20 before the new gate.

Boundary Marking: 21.6 miles of boundaries to be re-marked up to two times during period of this plan, approximately 2009 and 2017. Forester will mark lines every 8-10 years.

Stream Improvements: No new improvements planned. Establishment of permanent protective buffers for both Roberts Brook and Roaring Brook are part of this plan, for protection of one threatened species and rare stream habitats.

Water Bodies: Intentions for the pond in the new parcel south of Sunset Road should be addressed by Parks and Fisheries: Due to access considerations, this pond will probably not be listed for fishing or other recreation. It is advised that a "No Swimming" sign and "Area Closed at Sunset" sign be posted at the pond.

Cultural Site Maintenance: None in this block. Consideration should be given to either tearing down or properly preserving the old wooden silo at the edge of the fields off Sunset Road, for liability concerns for both the public and the neighbors in the private lot immediately adjacent to the structure. The State Parks Unit Manager should send a request up the chain of command to tear down the silo if that is the best option available.

Recreation or Scenic Site Work: Minor clearing of brush to improve views from Pine Mountain along Tunxis Trail could occur upon interest and discretion of State Parks or CFPA.

Improvement of Critical Habitat: Build and install up to three saw-whet owl nesting boxes at separate locations in conifer stands near wetlands or streams. Wildlife Division to build boxes, and the DEP Forester to assist Wildlife Division in locating sites and installing them. Wildlife Division to monitor annually.

Trail Maintenance: No designated or authorized trails maintained by DEP. The Tunxis Trail is maintained by volunteers of the Connecticut Forest and Park Association (CFPA). Cross-country ski trails formerly maintained by the Pine Mountain Ski Touring Center are discontinued unless under future Special Use License.

Upland Wildlife Opening Work or Leasing: The Wildlife Division will provide equipment and labor to re-open and maintain all fields at Tunxis, primarily off Sunset Road. Forestry will facilitate this work by modifying silviculture in neighboring stands to enhance the wildlife benefits of these permanent herbaceous openings through timber sales agreements and by creating and improving access into and around these fields.

Wildlife Habitat Improvement: See "Improvement of Critical Habitat" above. No other specific habitat improvement projects other than the benefits of forest management activities that are striving for a more diverse forest.

Wildlife Population Controls: Hunting and trapping will continue to be permitted under applicable laws. No changes expected.

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Bureau of Natural Resources

Memorandum ☐ WILDLIFE DIVISION

To : David Irvin, District Forester
DEP-Forestry, Pleasant Valley Field Office
P. O. Box 161, Pleasant Valley, CT, 06063

From : Julie Victoria, Wildlife Biologist Julie
DEP Wildlife, Franklin Swamp WMA, 391 Route 32, Franklin

Date : April 6, 2005

Subject: Management Plan for Hartland Hollow Block, Tunxis State Forest (Hartland)

Your request was forwarded to me on 4/5/05 from Dawn McKay of the DEP-EGIC Natural Diversity Database. There are records of a state threatened species, the Northern Spring Salamander (*Gyrinophilus porphyriticus*) and a species of special concern, Wood turtle (*Glyptemys insculpta*) in the vicinity. Also, in the past, records of the Saw-whet owl (*Aegolius acadicus*), a species of special concern, have been included in this area – I'm not sure why they weren't this time. The Northern Spring Salamander requires cold, clean, well oxygenated springs, brooks or seepage areas. Their favored habitat is heavily forested steep rocky ravines. While they could probably tolerate a decrease in water supply if it remained cold - the complete lack of water would jeopardize this species existence.

I recommend a 50' buffer along drainage areas and a 100' buffer along Roaring Brook. I recommend harvesters keep stream crossings to a minimum. This is the only state property where this species has been documented and maintaining the integrity of the area is important.

Our data on Northern Saw-whet owl distribution and abundance in Connecticut is poorly documented as are their habitat requirements and limiting factors. Fragmentation and loss of habitat to human development are continuing problems for this species in the Northeast. The species is associated with coniferous woods. They are nocturnal birds that hunt along the edges of open parks, meadows or fields. Their food items are mainly insects and occasionally mice, chipmunks and birds such as sparrows and juncos. Northern Saw-whet owls are cavity nesters and will nest in artificial nesting boxes that are placed in the area. Artificial nesting box plans will be provided at your request. Nesting boxes and silvicultural practices that maintain high densities of nesting and roosting cavities in trees with a minimum diameter of 30.5 cm will benefit this species.

Wood turtles require riparian habitats bordered by flood plains, woodlands or meadows. Their summer habitat includes pastures, old fields, woodlands, power line cuts and railroad beds bordering or adjacent to streams ,and rivers. They hibernate submerged in tangled tree roots along the river banks or in deep pools from November 1 to April 1. According to DEP-EGIC, wood turtles were found on Pine Mountain Road. Wood turtles can use areas up to 1500 feet from the streams/rivers where they are found. This species is dormant from November 1 to April 1. They have been negatively impacted by the loss of suitable habitat. I recommend that work be done during the dormant period, which is November 1 to April 1, to avoid affecting wood turtles.

Thank you for the opportunity to comment. If you have any questions please feel free to contact me.

cc: D. McKay - 13792

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

MEMO

to: David Irvin, District Forester
DEP-Pleasant Valley Field Office
P.O. Box 161
Pleasant Valley, CT 06063

from: Dawn McKay, Environmental Analyst 3/Biologist
DEP-Environmental & Geographic Information Center
79 Elm Street, Store Level
Hartford, CT 06106

subject: Management Plan for Hartland Hollow Block of Tunxis Forest in Hartland, Connecticut

date: March 29, 2005

I have reviewed Natural Diversity Data Base maps and files regarding the area delineated on the map you provided for the proposed management plan for Hartland Hollow Block of Tunxis State Forest in Hartland, Connecticut. According to our information, there are current records for State Special Concern *Glyptemys* [=*Clemmys*] *insculpta* (wood turtle) from the area of Pine Mountain Road and records for State Threatened *Gyrinophilus porphyriticus* (northern spring salamander) from Roaring Brook. I have sent your memo and map to Julie Victoria (DEP-Wildlife; 860-642-7239) for further review. She will write to you directly with her comments.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Natural Resources Center's Geological and Natural History Survey and cooperating units of DEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available.

Please contact me if you have further questions at 424-3592. Thank you for consulting the Natural Diversity Data Base.

Cc: Julie Victoria
NDDB # 13792

REVIEW

TUNXIS STATE FOREST
HARTLAND HOLLOW BLOCK

SUBMITTED BY CALVIN INNES, PEOPLES STATE FOREST
UNIT SUPERVISOR

Within the Hartland Hollow block are numerous old house sites, some of which I suspect date back as far as colonial times. These sites should be identified and protected until the historical significance of these sites can be ascertained.

There is a foundation site on the left side of Old Rte 20 in close proximity to the DEP gate, Compartment 3. This happens to be in the area of Dr. Emmons clinic and should be verified that it either is or is not the site.

There is a house site, foundation and stone lined well on the right side near the end of Pine Mountain road, compartment25. Details of the history of the site are unknown to me.

On the southern boundary of the Hartland Hollow Block is the MDC road opposite Legytte Road. Not too far in, on the right side is also an old dwelling site with foundation and well, compartment 57. Nothing is known to me of this site. These sites should be reviewed by either town or state historical organizations to verify their historical significance, if any, within the community.

I would suspect that there are also more sites within this block and, if found, should be researched and dealt with accordingly.

It is our heritage and should be protected.

Calvin K. Innes
Jan. 26, 2008