Indiana Department of Natural Resources - Division of Forestry

"DRAFT" RESOURCE MANAGEMENT GUIDE

Yellowwood State Forest Compartment **3** Tract **32**
Total Tract acreage: **148 acres** Commercial Acres: **148** Date: **11/18/10**
Forester: **L. Burgess**

Location

Tract 32 is located in Brown County Section 22, T8N R2E. The tract is located at the south end of Miller Ridge where it borders Hoosier National Forest.

General Description

The cover type within this tract is primarily mixed hardwood with a large oak component. Other types include (in descending order) mixed oak, Chestnut oak, Yellow poplar, Yellow poplar/White oak/Red oak, White pine stands and 4 regeneration openings 3.8 acres total) from 1994-95 harvest. The 2010 inventory data noted the frequency of tree species within each category of the tract's forest canopy (listed in descending order of occurrence):

Overstory	Understory	Regeneration
Chestnut oak	Chestnut oak	American beech
Black oak	Sugar maple	Sugar maple
Yellow poplar	White oak	Red maple
White oak	Red maple	Dogwood
E. White pine	Blackgum	Blackgum
Sugar maple	Bitternut hickory	Sassafras
Northern red oak	American beech	E. white pine
American Sycamore	Blackgum	Yellow poplar
Scarlet oak	Black oak	Chestnut oak
White ash	Shagbark hickory	Pignut hickory
Bitternut hickory	E. White pine	Bitternut hickory
Red maple	Largetooth aspen	Bluebeech
Shagbark hickory	Northern red oak	Ironwood
Pignut hickory	Yellow poplar	White ash
American beech	Scarlet oak	Pawpaw
Black cherry	White ash	Basswood

History

This acreage was acquired by Yellowwood State Forest in November of 1956.

Resource management history for Tract 32 prior to consolidating with Tract 33 in October 2010:

12/84 Tract 32 was created by subdividing tract 21 into 3 tracts (Tracts 25, 32 and 33)
7/89 Road construction
11/89 Inventory by forester Eckart. Management plan listed Present Volume at 8,609 bd.ft./acre on the commercial acreage of 50 acres.
10/90 Completed access road
4/91 Access road was disced and seeded
10/92 Management plan by forester Eckart, followed by timber marking
12/92 Marking complete: est. 102,900 bd.ft. in 446 trees
4/93 Vine TSI (on east slope) by forester Eckart

5/93 Skid trail construction
7/93 Timber sale in conjunction with C3T33 Est. 205,329 bd.ft. in 920 trees. No successful bidder
8/93 Timber resale. Foley Hardwoods, Inc. was successful bidder
6/94 Timber sale extension granted
8/94 Timber harvesting began by Foley's on west half of the tract
12/94 West half completed
2/95 TSI of 3 openings on east facing slope by forester Eckart
6/95 Chet Morgan's crew began harvesting east half of the tract
8/95 East half completed
10/95 Sale close-out
2/95 TSI of regeneration opening on west facing slope completed by contract TSI crew

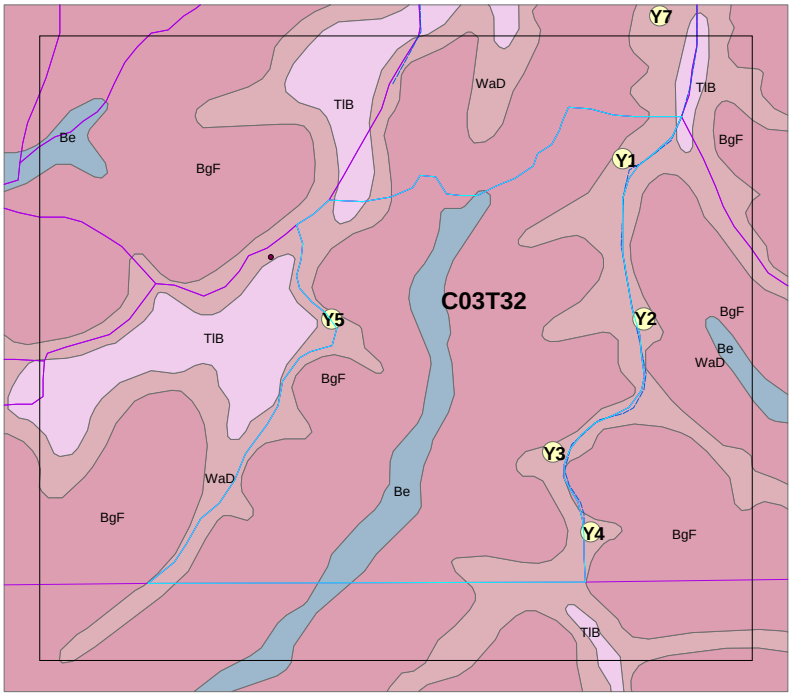
Resource management history for Tract 33 prior to consolidating with Tract 32 in October 2010:
12/84 Tract 33 was created by subdividing tract 21 into 3 tracts (Tracts 25, 32 and 33)
3/85 Recon of tract by forester Eckart
10/90 Road construction
1/91 Tract inventory by forester Eckart. Management plan listed Present Volume at 6,254 bd.ft./acre on the commercial acreage of 75 acres.

4/91 Discing and seeding of access road
4/92 Tract passed archaeological review process
11/92 Timber marking by forester Eckart
12/92 Marking completed. Est. 101,824 bd.ft. in 472 trees
4/93 Vine TSI by forester Eckart
5/93 Skid trail construction
7/93 Timber sale in conjunction with C3T32 Est. 205,329 bd.ft. in 920 trees. No successful bidder
8/93 Timber resale. Foley Hardwoods, Inc. was successful bidder
6/94 Timber sale extension granted
8/94 Timber harvesting began by Foley's on west half of the tract
12/94 West half completed
2/95 TSI of 3 openings on east facing slope by forester Eckart
6/95 Chet Morgan's crew began harvesting east half of the tract
8/95 East half completed
10/95 Sale close-out

Landscape Context
This tract is surrounded by State Forest on three sides and Hoosier National Forest along the southern boundary. Brown County State Park is approximately ¼ mile east.

Topography, Geology and Hydrology
The tract is comprised of about 10% ridgetop and the remaining acreage covers all aspects with slopes ranging 5-65%.
The soil types noted in next section are unglaciated soils and have formed from the bedrock material of sandstone, shale and siltstone.
The 1993 quad map that contains this tract identifies the tract has only a mapped intermittent stream in the central portion. The tract drains into a mapped darker blue line

perennial stream further south in the Hoosier National Forest and this drainage lies within the Lake Monroe-Crooked Creek watershed.



Soils

Berks-Trevlac-Wellston complex (**BgF**) 20 – 70 percent slope. Severe limitations noted for skid trails and logging areas due to slope*. Slight windthrow hazards. Comprises 70% of tract acreage.

Wellston-Berks-Trevlac complex (**WaD**) 6 – 20 percent slope. Slight limitations for skid trails and logging areas. Comprises 20% of tract acreage.

Wellston-Berks-Trevlac complex (**Be**) Nearly level and gently sloping. Slight limitations for skid trails and logging areas. Comprises 9% of tract acreage.

Wellston-Berks-Trevlac complex (**TlB**) 2 – 6 percent slope. Generally level and gently sloping. Slight limitations for skid trails and logging areas. Comprises <1% of tract acreage.

(*Building skid trails on the contour and constructing waterbars are measures taken to reduce erosion potential.)

Access

The recently upgraded firetrails along Miller Ridge provide good access to this tract.

Boundary

Tract is surrounded by State Forest acreage with exception of the southern line that borders the Hoosier National Forest. The eastern portion of tract is bounded by Miller Ridge. This firetrail is also a handicap hunter trail for use by ATVs with a permit and also a portion is Horsetrail “D”.

Wildlife

Wildlife resources in this tract are abundant. Common species which are present include: squirrels, white-tailed deer, turkey, various small furbearing animals, and a variety of songbirds. Ruffed grouse are frequently seen or heard in this general area, although are usually single birds. The decline of this species state-wide merits a sincere attempt to create desirable habitat for this species. This emphasizes the need to create regeneration openings that will increase the early successional component in an area already holding a small yet resident ruffed grouse population. An official wildlife ecological review was completed on the tract. This review focuses on wildlife

habitat as well as exotic species present in the tract and what can be created and controlled through management activities. The inventory for this tract included recording structural habitat features at each data point; these records include snag (dead, standing tree) counts. The results of these collected data for snag counts are included on the bat guidelines form for this tract. There is one wildlife pond within this tract that is located on a broad ridgetop. This pond is approximately16 feet in diameter and was created by Division of Fish and Wildlife. Management activities will be kept outside a 35 foot buffer as outline in the BMP guidelines.

Legacy trees*	**Maintenance level**	**Inventory**	**Available above Maintenance**
11″ + DBH	1332	2494	1162
20″ + DBH	444	343	-101

*Species include American elm, Bitternut hickory, Cottonwood, Green ash, Red oak, Post oak, Red elm, Shagbark hickory, Shellbark hickory, Silver maple, Sugar maple, White ash and White oak

Snags (all species)	**Maintenance level**	**Optimal level**	**Inventory**	**Available above Maintenance**	**Available above Optimal**
5″ + DBH	592	1036	992	400	-44
9″ + DBH	444	888	470	26	-418
19″ + DBH	74	148	30	-44	-118

Cavity trees (all species)	**Maintenance level**	**Optimal level**	**Inventory**	**Available above Maintenance**	**Available above Optimal**
7″ + DBH	592	888	195	-397	-693
11″ + DBH	444	592	130	-314	-462
19″ + DBH	74	148	37	-37	-111

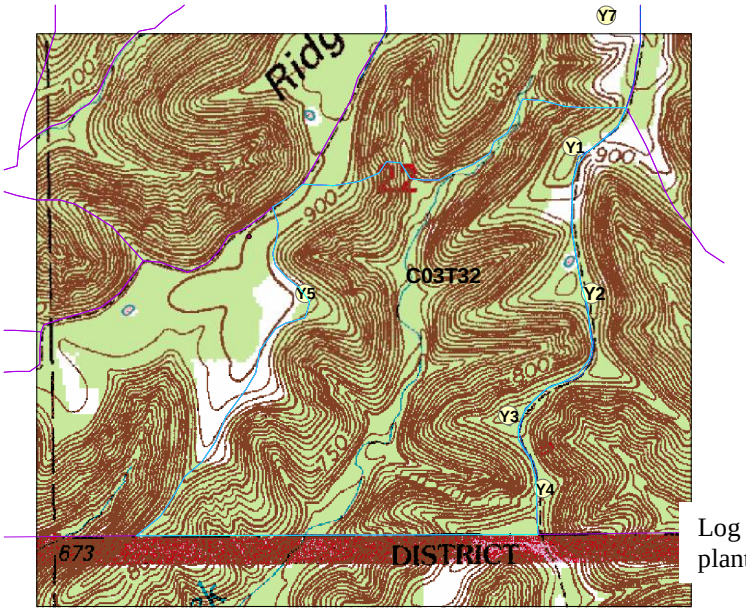
Communities

A Heritage database review was submitted for this tract. No RTE or species of special concern were noted within tract on the review. Timber rattlesnake, Black-throated Green Warbler, Red-shouldered Hawk, Worm-eating Warbler, Yellowwood trees, Dry-mesic Upland Forest and Mesic Upland Forest were noted within the Heritage database review in nearby acreage. Affects on these species and habitat types resulting from the management activities planned for this tract are noted as follows:

Timber rattlelsnakes are abundant in this area and will benefit from any additional logging debris for hunting and cover.
Black-throated Green Warblers: "In almost all cases, the Black-throated Green Warbler is classified as a forest specialist: it inhabits larger tracts of forest and tends to avoid disturbed or edge habitats and small forest patches. Recent work in Alberta reveals a consistent association of the Black-throated Green Warbler with deciduous or coniferous dominated mixedwood, with a dependence on the presence of some coniferous canopy trees" (Ref. source 2). This tract is primarily hardwood forest but does contain some planted pine stands. Some of the pine will be removed with timber harvest activities, especially those Virginia pine which are already dying out of the stand. A few White pine will also be marked with the harvest, however several acres of pine will be retained. The small scale of this disturbance to the coniferous component should have little or no impact on this species.

Red-shouldered Hawks are not common in this tract and their preferred wetland forest type (Ref. source 1.) is not present directly in the tract , however this habitat is nearby within the Army Corps of Engineers acreage of Lake Monroe near Elkinsville and Crooked Creek boat ramp.
Worm-eating Warbler "breeds in mature deciduous forests or mixed deciduous-coniferous forests with patches of dense understory, usually on steep hillsides" It forages in the understory gleaning insects from low shrubs and rarely on the forest floor other than probing into dead leaves. It depends on large forests for nesting. Given this information, the proposed management will have a slight negative impact on this species especially within the group selection openings. The effects will be temporary as the openings will revert into mature forests through succession (Ref. source 3).
Yellowwood trees benefit from disturbance. Although this species is not known to be present within this tract the proposed openings to be created with timber harvesting could provide the opportunity for this species to become established, especially within the northeast lower slopes.
The forest types will generally remain consistent within this tract as most management through timber harvesting will be by single tree selection. Those areas that will be regenerated will naturally pass through succession into hardwood stands.

Invasives/Exotics
Autumn olive was noted during the tract inventory. It was planted around the log yards following the harvest for wildlife habitat enhancement (probably in spring 1996). AUO was later found and listed as an invasive. The method of eradication will be chemically treating with Garlon4 and oil surfactant utilizing a basal bark treatment and will be scheduled during post harvest TSI.



Log yard locations: Autumn olive was planted around these yards.

Recreation

This tract is used for hunting, hiking and wildlife viewing. Horsetrail "D" is located along the tract's eastern boundary. A portion of the Tecumseh Trail runs through this tract. Horse traffic and hikers will be rerouted to another trail or may experience a short trail closure prior to harvest activities. There are two public parking areas. This area is handicapped hunter accessible.

Cultural Resources

No cultural resource sites were observed during the tract's inventory.

Inventory Results

Present tract volume estimates:		**Basal Area (includes sub-merch. stems)**
Harvest volume	**3,052 bd.ft./acre**	**35**
Leave volume	**3,000 bd. ft. /acre.**	**60**
Total tract	**6,052 bd./ft./acre**	**95**

Harvest/Leave Report Summary
MBF=1000 board feet

SPECIES	HARVEST MBF	LEAVE MBF	TOTAL MBF
American Beech	5.29	0.0	5.29
American Elm	0.0	2.17	2.17
American Sycamore	7.54	51.54	59.08
Basswood	0.0	5.08	5.08
Bitternut Hickory	0.0	25.75	25.75
Black Cherry	0.0	5.63	5.63
Black Oak	68.47	27.75	96.23
Chestnut Oak	83.91	94.65	178.56
Eastern White Pine	43.47	33.98	77.45
Northern Red Oak	25.01	65.67	90.68
Pignut Hickory	3.26	9.04	12.3

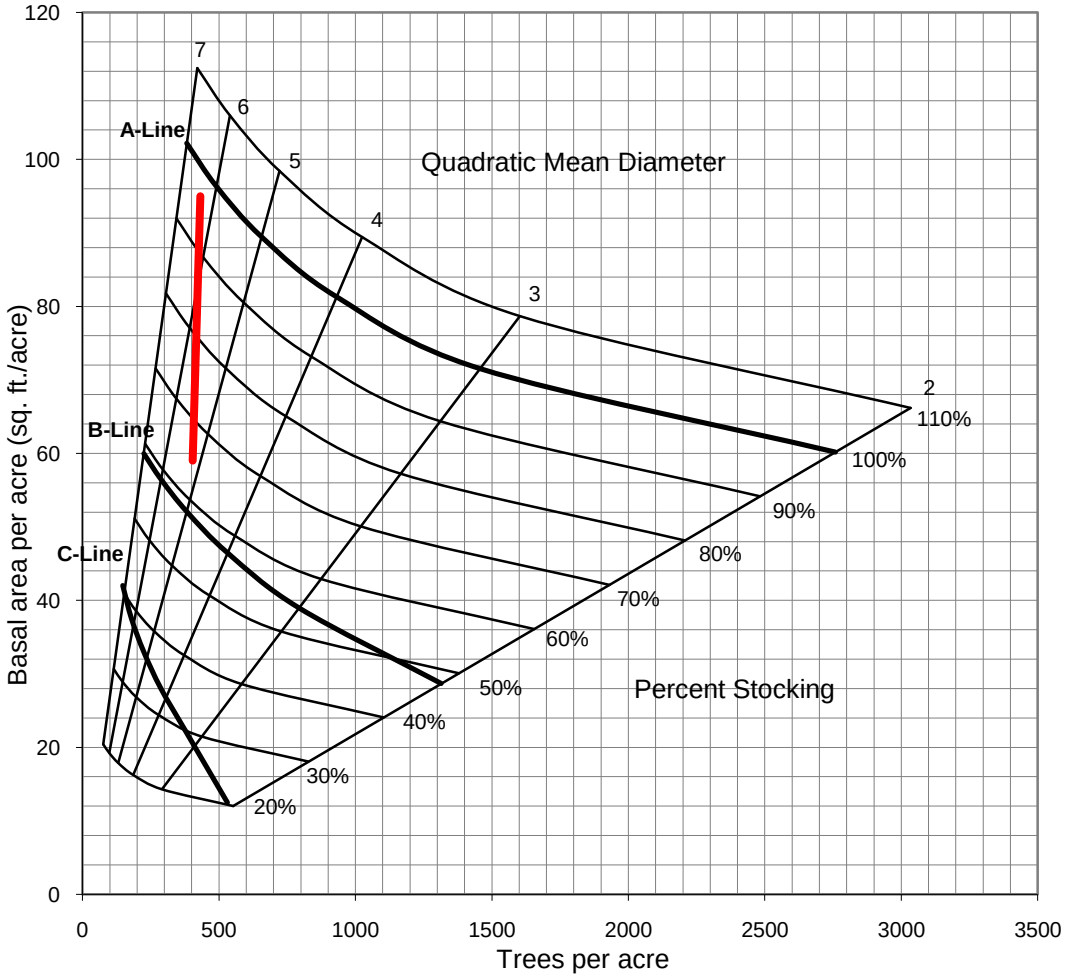
Red Maple	11.35	0.0	11.35
Scarlet Oak	15.25	13.75	29.0
Shagbark Hickory	2.78	11.24	14.02
Sugar Maple	12.78	7.85	20.62
White Ash	21.77	3.91	25.68
White Oak	8.21	57.59	65.8
Yellow Poplar	142.58	28.35	170.93
Totals			
PER ACRE	3.05	3.00	6.05
TRACT TOTAL	451.67	443.96	895.62

Discrepancies due to rounding.

Hardwood stand Acreage	148 acres		Present Volume per Acre	6,050bd. ft.
Basal Area per Acre	95 sq. ft.		Harvest Volume per Acre	3,050 bd. ft.
Number Trees per Acre	74		Residual Volume per Acre	3,000 bd. ft.
Stocking Percentage	97%		Average Tree Size	6.5″ dbh.

To submit a comment on this document, click on the following link:
http://www.in.gov/surveytool/public/survey.php?name=dnr_forestry

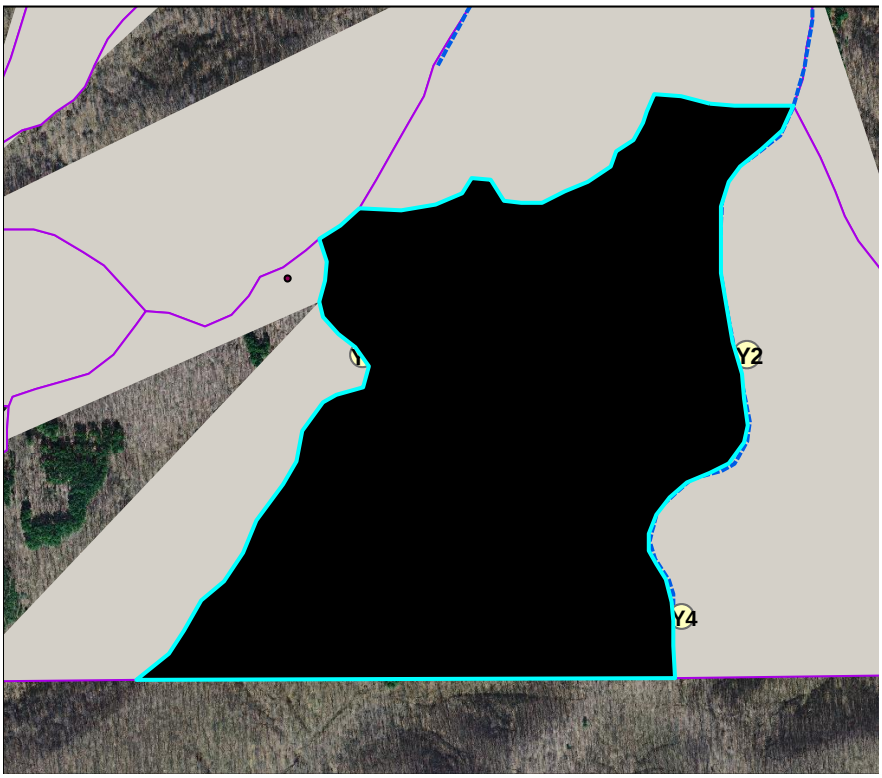
You **must** indicate the State Forest Name, Compartment Number and Tract Number in the "Subject or file reference" line to ensure that your comment receives appropriate consideration. Comments received within 30 days of posting will be considered.



Tract Prescription and Proposed Activities

This tract is comprised primarily of mix oak/hickory stands with five White pine stands totaling approximately 6.5 acres. Some Virginia pine are also present, however this species is declining due to age. Good oak regeneration was noted among this dying out Virginia pine. There were no sawtimber stems noted, however TSI would greatly benefit the advancement of this oak component. The inventory results indicate this tract would sustain and benefit from a harvest this cycle. Recommendation is for an intermediate, improvement harvest utilizing single-tree selection as well as regeneration openings. Several acres have occasional dead oaks. This decline in vigor has naturally thinned portions of these oak stands to desirable stocking levels, therefore little or no marking will occur in these areas. There are sections of the tract which have dead as well as dead and down stems, many of which are oaks. These stands would best be regenerated as the dying oak have only primarily released the maple and beech understory component. The broader ridgetops hold several Yellow Poplar as well as Red Maple and Sugar Maple. Regenerating these areas would simply regenerate Yellow Poplar with a primary benefit of creating early successional habitat. These openings will be included in post-harvest TSI along with the opening created in the 1994-95 harvest.

This tract was inventoried by 1 point per 3.5 acres in prism plots. The entire 148 acres were input as hardwoods for the inventory volume summary although there are 6.5 acres of white pine and approximately 3 acres of regeneration from 1994-95 harvest.



The marking objective will be the removal of mature/over-mature stems, as well as those of low quality in an effort to improve the overall health, vigor and composition of the stand. The reduction of stocking levels should provide space for pre-selected crop trees to move forward into the next cutting cycle. Species composition will likely become more diverse and less susceptible to insect and disease infestation which is a common problem with homogeneous stands. These management techniques will improve the overall health, vigor and quality of the residual stand, while utilizing stems dropping out due to natural mortality, overstocking or maturity. Post harvest TSI is planned to reduce stocking in some areas of high basal area with pole-sized stems and release crop trees not successfully released during the harvest.

Wildlife will benefit from this harvest as well. Additional sunlight penetrating the forest floor will simulate the development of new ground flora, subsequently increasing nesting and foraging habitat. This is essential for game and non-game species as well as continued forest development. Post-harvest TSI will increase snags per acre while diversifying diameter distributions of both snags and growing stock trees.

Habitat/cover types currently present within the tract will remain throughout the majority of the tract after the proposed management activities with the possible addition of additional early successional wildlife areas in regeneration openings. These openings may be up to 5 acres in size. The location of these openings would occur along maintained forest edge which is the firetrail.

RESOURCE MANAGEMENT GUIDE
Amendment
Yellowwood State Forest Compartment **3** Tract **32**
January 21, 2011

A significant difference in the amount of board foot volume marked versus board foot volume estimated from the inventory was detected after marking this tract. The total estimated board footage marked for the tract was significantly lower than the inventory estimation. Review of the inventory data reveals that there were areas tallied for regeneration openings. These openings were marked, however the size of the openings was smaller than the extrapolated data predicted. The inventory of the 148 acres was based on 42 points of data. Therefore the harvest and leave estimation per one acre was extrapolated to include 3.5 acres.
Another factor was the stands of Eastern White Pine were extrapolated throughout the entire 148 acres. Also, there were 20 acres or more of the tract which did not receive any marking primarily due to low or adequate stocking.
Regarding the results of Item 2.2 on the Ecological Review for this tract: It has been determined by the Wildlife Specialist for the Division of Forestry that the number of cavity trees per acre is substantial and the estimations determined by the inventory is not an adequate representation of the true number of cavity trees. Also, the estimated number of snags as indicated by the inventory within this tract is much lower than the actual number. Visual inspection while conducting the inventory reveals several snags. Many of the snags are consolidated such as pockets of oaks likely that resulted from the last outbreak of Linden Loopers.

Proposed Activities Listing

Archaeological Site review planned in 2010/2011.
Timber marking, harvest and TSI planned in 2010/2011.
Post Harvest TSI will include treatment of any invasive exotics discovered during inventory and harvest recons.
Stand Re-inventory work 2030

References:
1.Red Shouldered Hawk:
http://www.fs.fed.us/r9/wildlife/tes/ca-overview/docs/red_shouldered_hawk_ca_1202final.pdf
2.Black-thoated Green Warbler:
http://www.abheritage.ca/abnature/speciesatrisk/green_warbler_intro.htm
3. References:
Worm-eating Warbler :
(Hanners, L. A., and S. R. Patton. 1998. Worm-eating Warbler (Helmitheros vermivorus). June 15, 2010. <allaboutbirds.org/guide/Worm-eating_Warbler/lifehistory>)