Indiana Department of Natural Resources – Division of Forestry

Resource Management Guide - DRAFT

State Forest: Yellowwood
Tract Acreage: 68
Forester: James Dye
Management Cycle End Year: 2031

Compartment 06 **Tract** 02
Commercial Acreage: 68
Date: September 20, 2011
Management Cycle Length: 20 years

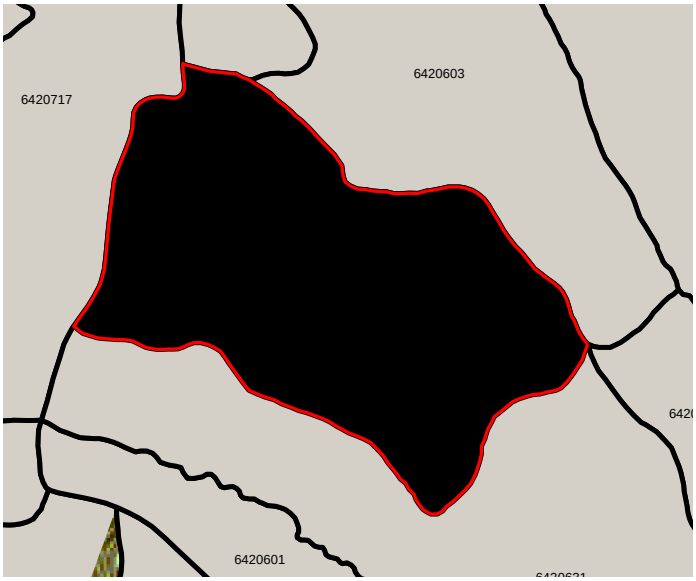
Location:

Compartment 6, Tract 2 lies mostly in the South Half of Section 20, but also extends south into the North half of Section 29, in Township-9-N Range-2-E of Washington Township in Brown County, Indiana. The tract lies approximately 11.7 miles east of the city of Bloomington, Indiana.

General Description:

This tract is an approximately 68 acre managed, multiple-use parcel located in an area of 1913 acres grouped together as various tracts in compartment 6. The timber type is predominantly closed canopy mixed hardwoods, but large areas of oak-hickory and pine are also present. This is an interior tract of Yellowwood State Forest and shares its entire boundary with other State Forest tracts. Tract boundaries are delineated by old roadbeds, topography, a mapped intermittent stream, property boundary, and also Dubois Ridge road along the westernmost edge. The tract is easily accessible via Dubois Ridge road, and a small parking area is located near the southwest corner of the tract. This area exhibits good opportunities for multiple use management, including timber management, wildlife management, and soil and water conservation. It is also ideal for public recreational activities such as hiking, horseback riding, gathering, hunting, and viewing.

Figure 1 – Yellowwood, Compartment 6, Tract 2



Below is a table (table 1) comprised from the 2011 forest inventory data and

shows the relative frequency of tree species in this tract:

Table 1 – Basic Forest Structure

Overstory	Understory	Regeneration
chestnut oak	American beech	red maple
yellow poplar	sugar maple	white ash
white oak	red maple	American beech
black oak	dogwood	hickory
Virginia pine	sassafras	white oak
sugar maple	blackgum	sassafras
Northern red oak	yellow poplar	black oak
American sycamore	elm	Northern red oak
scarlet oak	black cherry	chestnut oak
American beech	Eastern redbud	yellow poplar
bitternut hickory	Northern red oak	sugar maple
blackgum	Ohio buckeye	scarlet oak
largetooth aspen		pawpaw
red maple		blackgum
shagbark hickory		mulberry
white ash		
black cherry		
pignut hickory		
red elm		
sassafras		
Ohio buckeye		
dogwood		

History:

Yellowwood State Forest was created in 1940 when federal land was leased to the State of Indiana. The land was deeded to the state in 1956. Prior to that time, the Civilian Conservation Corps and Works Project Administration completed three lakes, a shelterhouse and a residence, all presently in use. Yellowwood Lake was completed in 1939. The 133-acre lake is about 30 feet deep.

Compartment 6, Tract 2 spans portions of several separate land acquisitions, all deeded to Yellowwood State Forest by the federal government. The topmost portion of the tract lies in a 63.1 acre section acquired on October 30, 1956. The majority of the tract lies in a 60.28 acre parcel acquired on November 25, 1955. The westernmost portion of the tract lies in a 39 acre parcel acquired on July 21, 1953. The lower part of the tract includes portions of three other

acquisitions: a 2.5 acre parcel acquired June 21, 1954, an adjacent 40 acre parcel acquired on the same day, and a 37 acre parcel acquired on November 25, 1955.

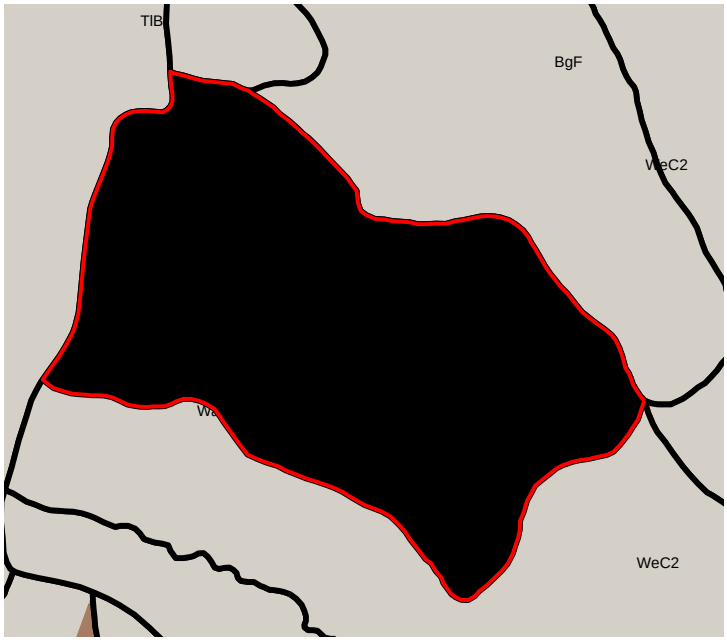
In July 1972, a "quickie cruise" was conducted, indicating 2,542 board feet (bd. ft.) per acre of harvest sawtimber and 1,163 bd. ft. per acre of residual sawtimber. In January 1978 a timber sale of 311 trees with an estimated 106,936 bd. ft. volume was conducted. In February 1979, post harvest TSI was conducted. Since then, a reconnaissance effort took place in February 1990 to follow up on the progress of the tract. In 1997 a forest inventory showed an estimated 2,048 bd. ft. per acre of harvest sawtimber and a residual of 4,753 bd. ft. A management plan and wildlife review followed a few years later, in May 2003, but no additional activities took place after that until the 2011 forest inventory.

Landscape Context:

This tract is surrounded primarily by closed canopy deciduous forests, but pine forests (mostly Virginia pine) are in and adjacent to the southeast. Dubois Ridge road comprises the west edge, and this area is part of an upland ridge. This is an interior tract of Yellowwood State Forest and all adjacent land is forested.

Topography, Geology, and Hydrology:

This tract is steeply concave with one relatively open, lowland side. The southwest corner of the tract is a flat, upland area. The north, west, and south sides, each containing several ephemerals, all slope steeply into the interior portion of the tract. In the heart of the tract, a mapped intermittent begins and flows to the southeast. The eastern portion of the tract is much less steep and is lower in elevation.



Soils:

The Berks-Trevlac-Wellston complex (BgF) is the most dominant soil type found in this tract, covering 47.25 of the tract's 68 acres. This soil is found on hills and slopes range from 20 to 70 percent.

Next most common and comprising 13.5 acres, are Wellston-Berks-

Trevlac complex (WaD). These soils are found on hills also, but slopes here range from just 6 to 20 percent.

The remaining soils are Tilsit silt loam (TiB) and Wellston-Gilpin silt loam (WeC2), comprising 3.5 and 3.75 acres of the tract's soils respectively.

For more information on these soils, see table 2 below.

Table 2 – Basic Soil Information for Compartment 6, Tract 2

BgF	**Berks-Trevlac-Wellston complex**		20-70% slopes	Sandstone-shale-36"
	Site Index - 70	Well drained, most areas in woodland, suited to trees Unsuitable for building sites and septic absorption fields		
47.25 Acres	Erosion *Moderate*	Equipment Limitations *Severe*	Seedling Mortality *Moderate*	Windthrow Hazard *Slight*
WaD	**Wellston-Berks-Trevlac**		6-20% slopes	Sandstone & shale-51"
	Site Index - 70	Well drained, primarily used as woodland, well suited to trees Severe limitations to buildings, septic, and roads due to slope		
13.5 Acres	Erosion *Slight*	Equipment Limitations *Slight*	Seedling Mortality *Slight*	Windthrow Hazard *Slight*
TlB	**Tiltsit silt loam**		2-6% slopes	Sandstone bedrock-58"
	Site Index - 70	Well drained, a few acres found in woodland, soil is suited to trees Severe wetness due to fragipan, somewhat limited for dwellings		
3.5 Acres	Erosion *Slight*	Equipment Limitations *Slight*	Seedling Mortality *Slight*	Windthrow Hazard *Slight*
WeC2	**Wellston-Gilpin silt loam**		6-20% slopes	Sandstone-shale-52"
	Site Index - 71	Well drained, most areas wooded, soil suited to trees Severely limited to building sites due to steepness of slopes		
3.75 Acres	Erosion *Slight*	Equipment Limitations *Slight*	Seedling Mortality *Slight*	Windthrow Hazard *Slight*

Access:

This tract is accessible via Dubois Ridge road. The surface is gravel, but appears to be in good condition. Additionally, fire trails extend east from Dubois Ridge road, generally along both the north and south edges of the tract.

Boundary:

This is an interior tract of Yellowwood State Forest and all of its boundaries are shared with other State Forest tracts. This tract's boundaries all follow various existing roads and old roadbeds or trails.

Wildlife:

Wildlife resources in this tract seem abundant. This tract contains habitat for a variety of wildlife species. Habitat includes mostly mixed hardwoods, but there are also large areas of oak-hickory and pine. The oaks, hickories, walnut, and beech provide hard mast for deer, turkey and squirrel. Snags (standing dead trees) and cavity trees provide nesting, bugging, and roosting opportunities for woodpeckers, songbirds, and small mammals. Rotten logs, crater knolls, small ponds, and the mapped intermittent stream provide habitat for herptiles and aquatic vertebrates.

Species and sign noted during the 2011 inventory include Eastern gray squirrel, chipmunks, white-tailed deer, various songbirds, woodpeckers, crickets, and cicadas.

A Natural Heritage Database review was obtained for this tract. If rare, threatened or endangered species were identified for this area, the activities prescribed in this guide will be conducted in a manner that will not threaten the viability of those species.

Wildlife Habitat Features:

According to the data collected during the tract inventory and represented in the following table (table 3), this tract is very well represented with habitat in regards to the number, size and species of dead (snag) trees suitable for consideration of the Indiana bat (*Mytolis sodalis*) and its suggested habitat requirements.

Snags, standing dead or dying trees, may be one of the most important wildlife habitat features in Indiana's forests as they are used by a wide range of species as essential habitat features for foraging activity, nest/den sites, decomposers (e.g., fungi and invertebrates), bird perching and bat roosting. Additionally, snags are an important contributor to the future pool of downed

woody material. In terms of snags, only the largest size class falls below maintenance level, while the smaller size classes are above even optimal levels.

Forest wildlife species depend on live trees for shelter, escape cover, roosting and as a direct (e.g., mast, foliage) or indirect (e.g., foraging substrate) food resource. The retention of live trees with certain characteristics (legacy trees and cavity trees) is of particular concern to habitat specialists such as cavity nesters or Species of Greatest Conservation Need like the Indiana bat. Legacy trees of a particular species having certain characteristics suitable as live roost trees for the Indiana bat are fairly well represented in all size categories, but care should be taken in management planning to preserve and encourage large legacy trees. Cavity trees meet and exceed both maintenance and optimum levels in all size classes.

Legacy trees, standing dead trees (snags) and cavity trees will be given consideration for retention as habitat for the Indiana bat and other wildlife as defined by the Resource Management Strategy for the Indiana bat on State Forest Property and the Management Guidelines for Compartment-level Wildlife Habitat Features. In addition, the girdling of select cull trees could be performed through post harvest timber stand improvement (TSI) to increase snag trees, particularly in the larger size classes.

Table 3 – Wildlife Habitat Summary

Legacy Trees*	Maintenance Level		Inventory	Available Above Maintenance	
11"+ DBH	612		1412	800	
20"+ DBH	204		148	-56	

* Species include: AME, BIH, COT, GRA, REO, POO, REE, SHH, ZSH, SIM, SUM, WHA, and WHO

Snags (All Species)	Maintenance Level	Optimal Level	Inventory	Available Above Maintenance	Available Above Optimal
5"+ DBH	272	476	525	253	49
9"+ DBH	204	408	415	211	7
19"+ DBH	34	68	33	-1	-35

Table 3 – Wildlife Habitat Summary (continued)

Cavity Trees (All Species)	Maintenance Level	Optimal Level	Inventory	Available Above Maintenance	Available Above Optimal
7"+ DBH	272	408	670	398	262
11"+ DBH	204	272	276	72	4
19"+ DBH	34	68	97	63	29

Communities:

Currently, there is a relatively low presence of exotic plant species within this tract. Some light to moderate patches of multiflora rose were observed, but multiflora rose is so widespread that it has naturalized to the area. No other exotics have been detected in this tract.

A Natural Heritage Database review was obtained for this tract. If rare, threatened or endangered species were identified for this area, the activities prescribed in this guide will be conducted in a manner that will not threaten the viability of those species.

Recreation:

The area is accessible via Dubois Ridge road, and a small parking area is located just off the road, near the northwest corner of the tract. This tract exhibits several recreational opportunities. A permanent hiking trail (the "10 O'clock line") has been established along the north edge of the tract, and a horse trail (the "Y" trail) follows the south boundary. Additionally, hunting is permitted on state forest property and this area also offers opportunities for off-trail hiking, gathering, and viewing.

Cultural:

Cultural resources may be present on this tract but their location is protected. Adverse impacts to significant cultural resources will be avoided during any management or construction activities.

Tract Prescription and Silvicultural Prescription:

This tract was not divided into subdivisions (non-stratified).

The timber type is predominantly closed canopy mixed hardwoods with areas of oak-hickory and pine. The over-story consists mostly of medium sawlog sized chestnut oak, yellow poplar, white oak, black oak, and pole and small sawtimber Virginia pine. Most of the trees in this tract greater than 20 inches in D.B.H. are either yellow poplar or black oak, but a few other oaks, American beech, and American sycamore have reached larger sizes on occasion. The overall quality of merchantable timber is fair with the poorest quality trees generally being the Virginia pine which is dying out and succumbing to windthrow. The large sapling and pole-sized under-story consists mostly of American beech, sugar maple, red maple, dogwood, sassafras, yellow poplar, chestnut oak, and blackgum. Seedling regeneration consists mostly of red maple, white ash, American beech, hickory, white oak, and sassafras.

The current stocking level of 104% indicates the tract has reached an overstocked condition. The biggest damaging agent is windthrow, commonly observed throughout the tract but especially in the Virginia pine stand.

The recommendation is to perform an intermediate harvest using the single tree selection method. This will result in thinning and a reduction of competition with and amongst the maturing, better quality sawtimber trees and preferred species. The composition of the tract will also be improved by harvesting low quality, damaged, diseased, dying and poorly formed trees as well as harvesting less desirable species such as maple, beech, sassafras, and sycamore. A few white ash trees are also present, and these should be harvested before the Emerald ash borer can infest the area. Group selection openings are recommended where possible in the declining Virginia pine areas in order to reestablish native hardwoods and, as in the remainder of the tract, improve tract vigor and composition.

Management in the form of Timber Stand Improvement (TSI) should be performed to control grapevines, release preferred crop trees through the culling of low volume, poorly formed trees and less desirable species, and to encourage early successional (oak) regeneration through the creation of canopy gaps and a reduction in understory shade tolerant species (sugar maple and American beech).

Standing dead trees (snags) and cavity trees will be given consideration for retention as habitat for wildlife. Legacy trees as defined by the Resource Management Strategy for the Indiana bat will be given consideration for retention as habitat for the Indiana bat. In addition, the girdling of select cull trees should be performed through post harvest TSI to address the suggested guidelines of the Strategy for the Consideration of the Indiana bat (IDNR – Division of Forestry, Resource Management Strategy for the Indiana Bat on Indiana State Forests, April 2008).

In terms of exotics, multiflora rose has largely established itself and naturalized to the areas of Morgan Monroe and Yellowwood forests, and no treatment for it is recommended. Although

there is no known presence of Japanese stiltgrass, it is a likely invader due to the horse and hiking trails present and care should be during any timber marking, harvest, or TSI activity to identify and treat it if found.

Where present and appropriately laid out, existing skid trails will be reused. Care should be taken with any new skid trails to prevent excessive erosion and damage to water quality. An old log yard is present in the southwest corner of the tract and should be reused for timber harvest operations. It is proposed that tracts 1, 2, and 31 all receive silvicultural treatments in the form of a combined timber harvest and TSI, thus the sale layout (including skid trails, log yard(s), etc.) will adequately span all of these areas combined.

The overall goal of this prescription is to make an improvement and group selection cuts which will reduce competition among the larger trees, provide resources for future crop trees through the removal of over-mature and declining trees, improve understory composition in favor of oak regeneration, and improve overall timber species composition while providing forest wildlife habitat.

Proposed Management Activities:	Proposed Dates:
Exotic/Invasive Species Control	2012-2013
Timber Sale and Harvest	2012-2014
Timber Stand Improvement	2013-2015
Inventory and New Management Guide	2031

The following attachments are kept in the tract file:

Ecological Resource Review

Aerial photo map with noted special features

Aerial photo map with noted unique areas

Soil type tract map

Indiana Natural Heritage Database Map

TCruise reports

Table 4 – Inventory Summary

Total Number of Trees per Acre: 173 **Average Tree Diameter:** 10.0"
Average Site Index: 70 **Stocking Level:** 104%

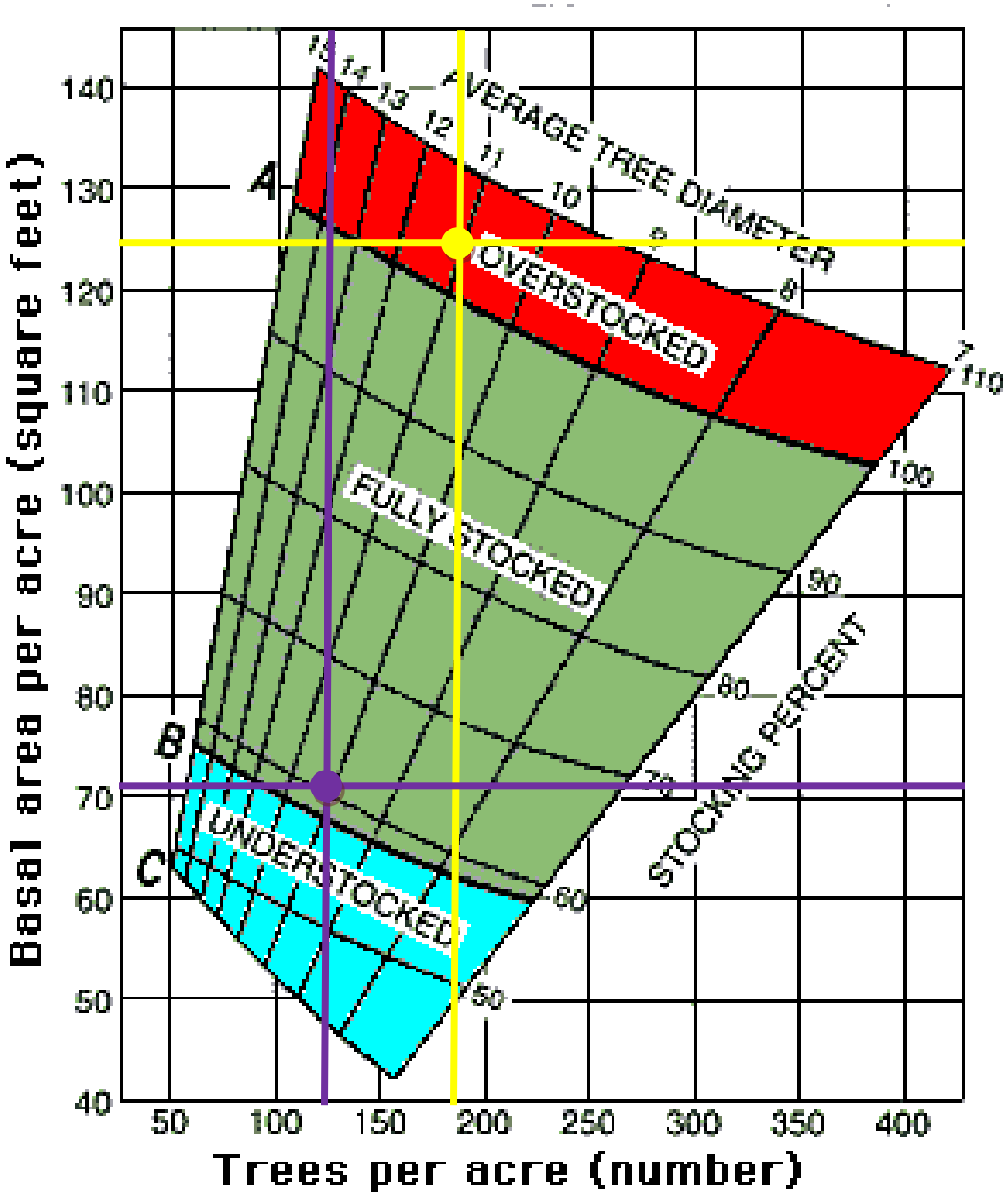
	Acres		Sq. Ft. per Acre
Hardwood Commercial Forest:	61	Basal Area Sawtimber:	93.9
Pine Commercial Forest:	7	Basal Area Poles:	20.4
Noncommercial Forest:	0	Basal Area Culls:	4.3
Permanent Openings:	0	Sub-merchantable:	5.8
Other Use:	0		
Total:	68	Total Basal Area:	124.4

Table 5 – Estimated Tract Volumes (Commercial Forest Area), Doyle Rule

Species	Harvest (bd. Ft.)	Leave (bd. ft.)	Total Volume (bd. ft.)
chestnut oak	33,760	92,370	126,140
yellow poplar	46,180	39,280	85,460
white oak	10,670	52,520	63,190
black oak	24,700	38,210	62,910
Virginia pine	28,730	27,830	56,560
sugar maple	15,360	18,220	33,570
Northern red oak	0	23,900	23,900
American sycamore	22,670	0	22,670
scarlet oak	12,430	9,910	22,330
American beech	3,590	13,740	17,330
bitternut hickory	0	8,970	8,970
blackgum	8,510	0	8,510
largetooth aspen	6,640	0	6,640
red maple	6,190	0	6190
shagbark hickory	0	5,180	5,180
white ash	3,630	0	3,630
black cherry	1,940	1,460	3,390
pignut hickory	0	3,090	3,090
red elm	0	2,610	2,610
sassafras	1,580	0	1,580
dogwood	0	0	0
Ohio buckeye	0	0	0
Tract Total	**226,580**	**337,290**	**563,850**
Per Acre Total	**3332**	**4960**	**8292**

Figure 3 – Gingrich Stocking Chart for 2011 Forest Inventory

Yellow lines indicate current values; Purple lines indicate projected values after timber harvest



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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.

Note: Some graphics may distort due to compression.