

**Process to develop Timber Suitability Map for Flathead National Forest Revision**  
**FINAL – February 2015**

Identification of lands not suited for timber production for reasons of being prohibited or withdrawn, technical considerations (e.g., irreversible damage), assurance of restocking, non-forest lands or developed for non-forest uses. (reference FSH 1909.12 Ch. 60, Sections 61.11, 61.13, 61.14, and 61.15)

Table 1. Summary acres from Timber Suitability analysis – Proposed Action: Feb. 2015

Category	Description	Acres	Acres – Planning Rule Category
Withdrawn – Legal reasons	MA 1a-Wilderness, MA 2a/b-WSR designated and eligible (wild segments), MA 4a-Research Natural Areas; Jewel Basin	1,091,245	<b>Withdrawn or Technical reasons</b>  <b>1,648,794</b>
	Inventoried Roadless Areas	460,761	
Non-forest uses	MA3a-Admin sites, Roads	14,731	
Non-forest types	Non Forest PVTs and Veg types	26,959	
Technology – Irreversible damage	Technical or Site Conditions	55,098	<b>Not compatible</b>  <b>245,450</b>
Not compatible with desired conditions	RHCA (within the suitable MAs)	85,911	
	MA 1b -Recommended Wilderness Areas (portion outside the areas already Withdrawn)	13,060	
	MAs 2a/b (rec & scenic segments), 3b, 4b (Coram Exp Forest), 5a-d, 6a, and some of the MA 7 areas	146,479	
Suitable	MA 6b-c (general forest), MA 4b (Miller Creek Demonstration forest), some of the MA 7 areas	500,779	<b>Suitable</b> <b>500,779</b>
<b>TOTAL</b>			<b>2,395,023</b>

**Suitable MAs (6b, 6c, parts of 7) as mapped = 637,419 acres**

136,640 acs (21% of total mapped area) of unsuitable lands within the suitable MAs (RHCA's ~63%, other site conditions ~27%)

Table 2. Timber production suitability classification (this table is in the Proposed Action)

Land Classification Category	Acres <sup>a</sup>
A. Total National Forest System lands in the plan area	2,395,023
B. Lands not suited for timber production due to legal or technical reasons	1,648,794
C. Lands that <b>may be suited</b> for timber production (A-B)	746,229
D. Total lands <b>suited</b> for timber production because timber production is compatible with the desired conditions and objectives established by the plan	500,779
E. Lands not suited for timber production because timber production is not compatible with the desired conditions and objectives established by the plan (C-D)	245,450
F. Total Lands <b>not suited</b> for timber production (B+E)	1,894,244

<sup>a</sup> Total forest acres do not exactly match total acres elsewhere in this document, due to minor differences that are generated during GIS analysis process.

Table 3. Analysis process and details

Category & Steps	Description	ID and Data Source
<p>1. Lands on which timber production is prohibited by statute, Executive order or regulation, or Withdrawn by Sec. of Agric. or Chief of Forest Service.</p>	<p><b>Designated wilderness areas, designated and eligible Wild &amp; Scenic Rivers (Wild segments), designated Research Natural Areas, Jewel Basin Hiking Area</b></p> <p>Note: Coram RNA is included in this step, but the remaining area in Coram Exp. Forest is included in later steps (unsuitable due to incompatibility with plan desired conditions).</p> <p><b>Inventoried Roadless Areas.</b> Recognized as administratively designated areas, and unsuitable for timber production, under state rules in 36 CFR Part 294 (FSH 1909.12 Ch. 10, Section 14).</p>	<p>FNF GIS Library for Revision – Feb 2015 MA layer - IRA layer - Jewel Basin</p>
<p>2. Lands developed for non-forest uses: Improved roads with right-of-way clearings; powerline/utility clearings; administrative sites</p>	<p><b>Administrative sites.</b> Includes all mapped admin. sites (MA 3a) <b>Existing Roads.</b> All roads (any jurisdiction) on NF lands, with a 33 feet total width incl. buffer.</p> <p>Note: per directives, improved roads are to be included as non-forest lands, but unimproved roads, trails, stream or clearings less than 120 feet wide do not need to be mapped as unsuitable. For this step, all existing roads (any jurisdiction) that occur on NF lands were considered “improved” and included in the calculation.</p>	<p>FNF GIS Library for Revision - Roads layer - Feb 2015 MA layer</p>
<p>3. Non-forested lands</p>	<p>Lands with &lt;10% tree cover; persistent grass, forb, shrub lands; rocklands; water.</p> <p>(a) Using VMap as primary source layer, identified the following Dominance Types in VMap: Water, Grass/Shrub/SparseVeg. (note: The FNF VMap excludes areas that are “non-forest” currently due to fire or harvest, e.g.= Transitional Forest type) (b) Using the R1 PVT layer (2004), selected out the following non-forest PVTs from the areas not already identified as unsuitable through VMap: agric; alpine; dry grass; fessida; fessca; mesicshrub; shrub; sparseveg; urban; ripdecid (shrubs); water</p> <p>Note: “agric” really isn’t agricultural lands, they are primarily natural openings, so it was included in this category.</p>	<p>FNF GIS Library for Revision - VMap layer (FP Revision) - R1 Potential Veg Type layer (2004)</p>
<p>4. Lands not suitable for timber production due to technology or site considerations, where harvest operations may result in either irreversible damage or where adequate restocking within 5 years is not</p>	<p>Areas where soils, geology or other physical site conditions are such that harvest may cause irreversible damage, or where tree regeneration and growth is severely inhibited. For example shallow or excessively wet soils; excessively steep slopes; avalanche areas; floodplains.</p> <p>(a) Using the FNF Land System Inventory layer, identified the following landtypes: 10-2, 10-3, 14-3: wet alluvial deposits; flood plains 12: wet meadow grasses, sedges, shrubs 17: avalanche debris 54: high elev cirque basins; rockland, lichens, mosses, grasses, shrubs</p>	<p>FNF GIS Library - Land System Inventory layer - R1 Potential Veg Type layer (2004)</p>

Category & Steps	Description	ID and Data Source
assured	<p>55: low to mid elev rocky hillsides; lichens, mosses, grasses, shrubs, a few trees</p> <p>72: steep high elev cirque headwalls and ridges; rockland, talus mosaic with soils</p> <p>75: rock cliffs; limestone; shrubs, grasses, a few trees</p> <p>(b) Identified the extreme end of the cold, high elevation sites, subject to greatly delayed tree regeneration and very slow tree growth. Used the R1 PVT layer (2004), and selected out the following PVTs: laly; pial. Total approx. 13,357 acs.</p> <p>Note: Did not include the whitebark pine dominance group from VMap, except where it happened to occur on the laly or pial PVTs. This is because WBP also grows on sites with more moderate conditions. Did not include other cold PVTs (i.e. abla4 or tsme), as they are considered less harsh sites than pial/laly. (2006 analysis also did not include these types either).</p>	
5. Lands not suitable for timber production due to incompatibility with plan desired conditions	<p><b>Riparian Habitat Conservation Areas.</b> These areas are identified and mapped <u>first</u>, before determining the areas excluded in the MAs listed below.</p> <p><b>MAs within this “non-compatible” category</b> (IRAs have been excluded from these MAs and classified as “withdrawn” – step 1 above):</p> <p><b>1b</b> - Recommended wilderness areas-outside IRAs (which are included in step 1 above)</p> <p><b>2a/2b</b> - Designated and proposed eligible Wild&amp;Scenic Rivers – only the recreation and scenic segments</p> <p><b>3b</b> - Special Areas</p> <p><b>4b</b> - Coram Exp. Forest (not including the RNA). Also not including MA4b Miller Cr. Demonstration. Forest, which is in suitable base.</p> <p><b>5a-d</b> - Backcountry</p> <p><b>6a</b> - General Forest Low</p> <p><b>7</b> - Focused Recreation Areas. Includes the MA7 areas identified as not suitable in proposed action (e.g., campgrounds, day use sites).</p>	<p>FNF GIS layers –RHCA - Feb 2015 MA layer</p>
6. Suitable for timber production	<p><b>Areas remaining after exclusions in steps 1-5 are suitable: MAs 6b, 6c and some of the MA 7 areas.</b> RHCAs have been excluded from these areas as non-compatible with DCs (step 5 above).</p>	

#### Documentation of GIS Steps

1. Sync the IRA layer with the MA layer boundary. Union MA with IRA; Delete polygons with “blank” in MA field (slivers, etc). Created layer = **MA\_IRA\_Union.shp**.
2. Create layer of existing areas that are withdrawn or prohibited from timber harvest. Extract MA 1a, 2a and 2b(wild), 4a from the MA layer. Created layer = **Withdrawn\_prohib.shp**.

This is used to ERASE road buffer layer, non forest and Tech/site layers. This is so these existing withdrawn areas remain intact, and lands excluded due to reasons which follow are not considered within these areas.

3. Make separate shapefile of MA 3a. Make shapefile of buffer from existing roads on NF lands, 16.5 feet each side.
4. Create non-forest uses layer. Union MA 3a with RoadBuffer layer = **“NonForestUses.shp”**
5. Create Non-Forest types layer, using VMap shapefile, the PVT and Dom Type fields. Delete the water polygons. Erase areas from this layer, using these layers: Withdrawn\_prohib.shp and NonForestUses.shp. Final product = **“NonForestTypes.shp”**
6. Create Tech/SiteType layer, using Landtype GIS database. Erase areas from this layer using these layers: Withdrawn\_prohib.shp, NonForestUses.shp, and NonForestTypes.shp. Final product = **“TechSiteUnsuitable.shp”**
7. Prepare IRA layer
  - a. Separate out IRA from the MA\_IRA\_Union.shp. Delete the slivers (areas that are in MA 1a, 2a/2b(wild), 4a (existing withdrawn areas).
  - b. Union the IRA layer with NonForestUses, NonForestTypes,, TechSiteUnsuitable. Make new field (UNSUIT\_1) and insert unsuitability reason. Where IRA overlaps other unsuitable polygons, the other classifications (NF use, NF type or TechSite unsuitability) will override IRA classification.

Final layer = **Union\_Withdrawn\_IRA\_NFUse\_Type\_Site.shp**

**This is the layer that will stay the same in ALL ALTERNATIVES.** It also allows tracking of the Total area in IRAs, but separates out unsuitable areas within IRAs due to NF uses, NF types, or Site unsuitability factors.

8. Integrate the RHCAs: Timber production is considered non-compatible with RHCA desired conditions, and needs to be excluded from remaining polygons in the MA layer.
  - a. Use ERASE to remove RHCAs from the area encompassed by the shapefile “Union\_Withdrawn\_IRA\_NFUse\_Type\_Site”. Don’t want to identify RHCAs within areas determined unsuitable based on withdrawals, site conditions, etc.
  - b. Also use “Union\_Withdrawn\_IRA\_NFUse\_Type\_Site” to erase the master (original) MA layer. This will leave an MA layer that has just the areas where RHCA will be incorporated, and boundaries will be better synced when joining them together.
  - c. Join (union) the erased RHCA layer with this new erased MA layer. Then union this layer back into the Union\_Withdrawn\_IRA\_NFUse\_Type\_Site.shp layer. Tidy up the resulting layer -remove “blank” slivers and unwanted fields; Add a field to identify the RHCAs.
  - d. Fill out the UNSUIT\_1 field with the “noncompatible” classification for the appropriate MAs and RHCAs. Clean up the strays.

Final layer = **FPR\_PA\_TimbSuit\_Feb2015.shp**

**This is the layer that is unique to the proposed action for the forest plan revision.**