Biodiversity Ecosystem Question 2 – Biogeographic Province

Goal: Maintain healthy forest ecosystems by maintaining a mix of habitats at different spatial scales capable of supporting the full range of naturally occurring flora, fauna, and ecological processes native to Southeast Alaska.

Objective: Maintain a forest-wide system of old-growth forest habitat to sustain old-growth associated species and resources.

Background: An integrated old-growth Conservation Strategy was developed provide a sufficient amount and distribution of habitat to maintain viable populations of old-growth associated species after 100 years and full implementation of the 1997 Tongass Land and Resource Management (1997 Forest Plan; USDA 2008b; p. D-17). This strategy was reviewed, revised, and incorporated into the 2008 Forest Plan Amendment (2008 Forest Plan). The Conservation Strategy includes two major components. First is the system of large, medium and small old-growth reserves (OGRs) well distributed throughout the Tongass. This system of reserves is made up of areas allocated to the old-growth habitat land use designations (LUD), plus lands in all the rest of the non-development LUDs, which essentially maintain the integrity of the old-growth system. This component provides adequate habitat for old-growth dependent or associated species, and provides for connectivity between reserves in order to prevent genetic isolation of populations. In response to concerns for small island endemic taxa, the 1997 and 2008 Forest Plans both protect all islands less than 1,000 acres from additional harvest of old-growth forest (USDA 2008c, D-10).

The second major element of the Conservation Strategy is a series of standards and guidelines applicable to those portions of the Tongass open to consideration for timber harvest (referred to as the matrix). The matrix includes lands designated as experimental forest, modified landscape, scenic viewshed and timber production LUDs and sometimes excludes the recreational river LUD. Within the matrix, components of the old-growth ecosystem are maintained by standards and guidelines to protect important areas and provide old-growth forest habitat connectivity. This component includes the beach and estuary fringe, riparian buffers, and other forest-wide standards and guidelines that preclude or significantly limit timber harvest in areas of high hazard soils, steep slopes, karst terrain, visually sensitive travel routes and use areas, and in timber stands technically not feasible to harvest. It also includes a number of species specific standards and guidelines such as raptor nest and wolf den protection areas (USDA 2008b, D-10).

During the National Environmental Policy Act (NEPA) analysis for the 2008 Forest Plan, a comprehensive review and mapping effort was completed for the small old-growth reserves. This review focused primarily on small OGRs because they received differing levels of review during the development of the 1997 Forest Plan. The large and medium OGRs were generally not reviewed because they received a rigorous review during the development of the 1997 Forest Plan and were designed to meet reserve strategy objectives (USDA 1997, p. 3-82) and few modifications were anticipated. The total acres of old-growth LUDs were increased by 38,749 acres from the 1997 Forest Plan to the 2008 Forest Plan (USDA 2008c, D-29). In addition, OGR locations were finalized for all but thirteen OGRs (identified in Appendix K of the 2008 Forest Plan Amendment). OGR locations are not expected to change unless they meet the limited circumstances described in Appendix K of the 2008 Forest Plan.

Biodiversity Ecosystem Question 2: Are the effects on biodiversity shown through the cumulative change in old-growth by biogeographic province consistent with the estimates of the Forest Plan (change could include effects of timber harvest, land exchanges or conveyance, windthrow, insect and disease, climatic changes, etc.)?

Evaluation Criteria

The effects on biodiversity as a result of cumulative change in old-growth habitat by biogeographic province will be determined by assessing changes in the amount of POG habitat (Biodiversity Evaluation Criteria, USDA 2008b, p. 6-8). Using a vegetation map in a geographic information system (GIS) and the Forest Activities Tracking System (FACTS) database, we will assess the change in acres of POG, high volume POG (HPOG), and Size Density 6 and 7 (SD67), a large tree POG, habitat due to timber harvest and land conveyance on National Forest System (NFS) lands by biogeographic province as compared to those displayed in the 2008 Forest Plan Final Environmental Impact Statement (USDA 2008c, tables 3.9-14, 3.9-15, and 3.9-16; p. 3-178, 3-180 and 3, 181).

POG, HPOG, and SD67 are identified spatially using the 1954 Size Density cover in the Tongass corporate GIS library. Harvested acres by all silvicultural systems are included except commercial thinning, which does not harvest POG, HPOG, or SD67. Following are definitions of POG, HPOG, and SD67:

- POG – Size Density classes 4H, 4S, 4N, 5H, 5S, 5N, and 67. This encompasses the commercial size timber across the Forest and ranges as listed below.
    - Small to medium diameter (quadratic mean diameter [QMD] < 21 inches) trees occurring at various densities and of volume class 4 (8 to 20 MFG/acre) and where tree diameters greater than 40 inches are generally rare.
    - Large diameter (QMD > 21 inches) trees occurring at low density (SDI < 280) of volume class 6 or 7 (> 30 MBF/acre) and where tree diameters greater than 40 inches are common and well distributed throughout the stand.
- HPOG – Size Density classes 5S, 5N, and 67. This is a subcategory of POG that only includes the stands where tree diameters are commonly larger than 40 inches, but may be patchily or uniformly distributed.
- SD67 – This includes only the 67 Size Density class of stands for which tree diameters are commonly larger than 40 inches and are well distributed throughout.

Large scale changes in forest cover due to windthrow and insect and disease outbreaks at the forest-wide scale will be tracked as part of the monitoring for 2008 Forest Plan Amendment Monitoring and Evaluation, question biodiversity 6: “Are destructive insects and disease organisms increasing to potentially damaging levels following management activities?”

Monitoring Results

There have been no changes in LUDs due to land exchange or conveyance since signing of the 2008 Forest Plan. Based on GIS analysis, 6,996 acres of POG were harvested (by all silvicultural systems)

during FY 2007 through 2012 occurred in seven biogeographic provinces[1] . Of these, 906 acres of POG forest was harvested in FY 2012 in three biogeographic provinces. This does not include commercial thinning, which does not harvest POG. Over fifty percent of the harvest over the past six years has occurred in the North Central Prince of Wales biogeographic province. The next largest harvest occurred in the Etolin Island and Vicinity biogeographic province at roughly twenty-four percent. A similar distribution is seen with the harvest of HPOG. However, the distribution of harvest of SD67 was different in that eighty percent was harvested from the North Central Prince of Wales Island biogeographic province.

The acres of POG, HPOG, and SD67which existed in 1954 and the acres and percent remaining in FY 2006 (prior to implementation of the 2008 Forest Plan) and at the end of FY 2012 are reported. Only the biogeographic provinces where harvest occurred between FY 2007 and FY 2013 are reported as the others will remain unchanged.

The percent of original POG, HPOG, and SD67 remaining in FY 2012 in all biogeographic provinces forest-wide, is above that predicted after 100+ years and full implementation of the Forest Plan. Since reported in the 2008 Forest Plan, the 1954 POG and SD67 have been reduced by an estimated one percent in the North Central Prince of Wales biogeographic province. In addition, the 1954 HPOG was reduced by one percent in the Southern Outer Islands biogeographic province. All other changes were less than one percent.

[1] Note that the FACTS database alone reports 6,829 acres of timber harvest in FY 2007 through FY 2012 the FACTS database alone reports 6,829 acres were harvested (excluding commercial thinning), whereas our GIS analysis using the 1954 Size Density data indicates 6,996 acres were harvested. Although FACTS is the official database for tracking timber harvest, it does not track the acres cut by Size Density class so cannot be used as the single source of data for this monitoring. The differences between the FACTS output alone and when joined with the 1954 Size Density feature class can be explained by the accuracy and precision of the latter. This feature class was derived from the size-density model (SDM) and the CoverType feature class. The model factors a variety of information including timber type, soil, and aspect in predicting the location and class of POG on the Forest. The SDM mapping accuracy is approximately 70 percent.

Biodiversity Ecosystem 2 Table 1. Estimated acres of productive old growth (POG*), high volume POG (HPOG**), and large-tree POG (SD67***) forest harvested by biogeographic province and fiscal year (FY). Estimates based on the 1954 Size Density feature class (map) in the Tongass Corporate Library and records of timber harvest by all silvicultural systems in the Forest Service Activities Tracking System.

Biogeographic Province		FY 2007			FY 2008			FY 2009			FY 2010			FY 2011			FY 2012		
#	Name	POG	HPOG	SD67	POG	HPOG	SD67	POG	HPOG	SD67	POG	HPOG	SD67	POG	HPOG	SD67	POG	HPOG	SD67
3	East Chichagof Island	40	30	0	0	0	0	24	9	0	25	1	0	10	1	1	0	0	0
6	West Baranof Island	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Kupreanof/Mitkof Islands	286	243	36	10	5	0	0	0	0	61	14	<1	0	0	0	0	0	0
13	Etolin Island & Vicinity	1145	602	7	0	0	0	286	131	0	94	43	35	120	19	0	34	6	0
14	North Central Prince of Wales	34	12	3	367	261	195	188	170	162	589	311	251	1600	775	413	857	558	283
15	Revilla Island/ Cleveland Peninsula	61	23	13	240	19	0	255	147	40	0	0	0	83	31	7	15	6	0
16	Southern Outer Islands	0	0	0	0	0	0	245	85	61	323	174	0	0	0	0	0	0	0
Total		1566	909	58	622	290	195	997	541	262	1092	543	286	1813	826	421	906	570	283

*POG habitat is defined as VEGCODES SD4H, SD4S, SD4N, SD5H, SD5S, SD5N, and SD67 in the 1954 Size Density feature class.

**HPOG habitat is defined as VEGCODES SD5S, SD5N, and SD67 in the 1954 Size Density feature class.

***SD67 habitat is defined as VEGCODE SD67 in the 1954 Size Density feature class.

Biodiversity Ecosystem 2 Table 2. Estimated acres of productive old growth (POG*), high-volume POG (HPOG**), and large-tree POG (SD67***) in 1954 (original) and the percent remaining (Remain) in FY 2006, and fiscal year 2012 by biogeographic province on Tongass National Forest lands. The 1954 and 2006 values are taken from tables 3.9-14, 3.9-15, and 3.9-16 in the 2008 Forest Plan Amendment Final Environmental Impact Statement (USDA 2008c). The acres of POG, HPOG, SD67 harvested (by all silvicultural systems except 4220 [commercial thinning]) from FY 2007 through FY 2012 were calculated in a geographic information system using harvest data from the Forest Service Activities Tracking System intersected with the 1954 Size Density Tongass corporate feature class. These harvested acres were then subtracted from the acres remaining in 2006 to calculate the acres remaining in 2012. Only those biogeographic provinces in which harvest occurred from FY 2007 through FY 2012 are included.

Biogeographic Province		Original (1954) POG					Original (1954) HPOG					Original (1954) SD67				
#	Name	1954 Acres	% in FY 2006	Acres in FY 2012	% in FY 2012	% in 100+ Years	1954 Acres	% in FY 2006	Acres in FY 2012	% in FY 2012	% in 100+ Years	1954 Acres	% in FY 2006	Acres in FY 2012	% in FY 2012	% in 100+ Years
3	East Chichagof Island	439,307	90	395,075	90	81	178,124	84	149,817	84	76	47,335	73	34,511	73	70
6	West Baranof Island	231,999	93	215,021	93	89	64,001	83	53,135	83	79	9,036	46	4,113	46	44
10	Kupreanof/ Mitkof Island	341,588	90	305,726	90	70	121,135	81	98,230	81	61	29,920	65	19,554	65	51
13	Etolin Island & Vicinity	254,781	86	218,430	86	69	99,193	77	76,065	77	61	22,847	54	12,387	54	43
14	North Central Prince of Wales	698,394	74	511,907	73	63	343,711	66	224,555	65	54	171,375	69	117,194	68	57
15	Revilla Islands/ Cleveland Peninsula	548,748	92	502,744	92	81	241,884	88	212,460	88	79	45,095	71	31,784	71	62
16	Southern Outer Islands	128,589	88	113,059	88	81	52,674	82	42,799	81	73	17,200	74	12,749	74	65
Forest-wide		5,405,872	92	4,947,558	92	83	2,299,369	87	2,006,550	87	79	669,321	80	536,532	80	72

*POG habitat is defined as VEGCODES SD4H, SD4S, SD4N, SD5H, SD5S, SD5N, and SD67 in the 1954 Size Density feature class.

**HPOG habitat is defined as VEGCODES SD5S, SD5N, and SD67 in the 1954 Size Density feature class.

***SD67 habitat is defined as VEGCODE SD67 in the 1954 Size Density feature class.

Evaluation of Results

No changes to the Forest Plan are indicated at this time. The effects of biodiversity shown through the cumulative change in old-growth by biogeographic province are consistent with the estimates evaluated in the 2008 Forest Plan Final Environmental Impact Statement (FEIS).

The 2008 Forest Plan assessed the effects of the maximum level of harvest to biodiversity. The allowable sale quantity (ASQ), which is the maximum amount of timber that can be sold in the first decade following the Forest Plan decision, is 2.67 billion board feet. This is equivalent to 267 million board feet (MMBF). This is the upper decadal limit on the amount of timber that may be offered for sale from suitable timberland on the Tongass as part of the regularly scheduled timber sale program. Timber has not been harvested at or near the maximum ASQ level throughout a single planning cycle. Since the adoption of the 1997 Forest Plan, total volume harvested has averaged 84 MMBF annually, only thirty-two percent of the annual average ASQ of 267 MMBF. The 2008 Forest Plan Record of Decision (USDA 2008a, p. 20) states that there is no expectation that timber will be harvested at a continuous rate of 267 MMBF over the next planning cycle of fifteen years.

The full implementation of the 2008 Forest Plan for 100 years would result in a moderate to very high degree of assurance that there would still be sufficient habitat to support long-term viability of wildlife species and that subsistence, recreational, and commercial uses of wildlife resources will be sustained The Conservation Strategy provides distribution of high quality old-growth reserves over the long term (USDA 2008a, p. 47). The Conservation Strategy provides habitat for viable populations of vertebrate species on the Tongass. This does not represent a “no risk” conservation strategy but a balance of wildlife conservation measures that considered the best available scientific information and reflected an acceptable level of risk for continued species viability, based on conservative assumptions (USDA 2008a, p. 16).

Action Plan

Continue to monitor the amount and distribution, of timber harvest, land exchanges or conveyance, windthrow, insect and disease and climate annually. Assess if monitoring question and approach can be better defined as information or models are developed to assess climate change. Assess the amount, distribution, and intensity of changes to old growth by change agent at five year intervals to assess effects to biodiversity.

Citations

USDA Forest Service, Tongass National Forest. 2008a Tongass Land and Resource Management Plan, Final Environmental Impact Statement, Record of Decision, Forest Service Document R10-MB-603a.

USDA Forest Service, Tongass National Forest. 2008b Tongass Land and Resource Management Plan, Forest Service Document R10-MB-603b.

USDA Forest Service, Tongass National Forest. 2008c Tongass Land and Resource Management Plan, Final Environmental Impact Statement, Forest Service Document R10- MB-603c.