2.6 Biodiversity Indicator 5. Patch Size Distribution

2.6.1 Background:

Natural forests are characterized by stand-initiating disturbances (e.g. wildfire, windstorms, insect outbreaks, etc.) that create a progression of canopy gaps or stand openings over time. From a forest management perspective, this aspect of biodiversity is addressed by using a harvest pattern that mimics the temporal and spatial nature of natural disturbances.

The frequency and size of disturbance events are closely linked to ecosystem type. The Biodiversity Guidebook broadly groups ecosystems into five "natural disturbance types" (NDT's):

- NDT1 – ecosystems in which disturbances (e.g. fire, blowdown, mortality due to large-scale insect attack) that result in natural openings rarely occur. These are predominately wetter, coastal or high elevation ecosystems.
- NDT2 – ecosystems in which disturbances occur infrequently
- NDT3 – ecosystems in which disturbances occur frequently
- NDT4 – grassland, shrubland and forested ecosystems that experience frequent low-intensity "stand-maintaining" fires
- NDT5 – Alpine Tundra and Subalpine Parkland ecosystems

Bulkley Landscape Unit Plans (LUP's) provide small, medium and large patch size distribution objectives that are applicable to the forested portions of NDT's within each approved landscape unit (Table 3). The intent is for objectives to be met by the end of the rotation period, which is commonly 60 or more years in the future.

To serve analysis and for simplicity, a "patch" is considered to be comprised of areas recently disturbed (i.e. less than 40 years of age) by either harvesting or fire, that are contiguous and within the same 20-year age class. A patch persists through time to the end of the rotation period.

2.6.2 Measure:

Current patch size distribution (forested area, by NDT by Landscape Unit) versus patch size distribution objectives as defined by approved Bulkley Landscape Unit Plans.

2.6.3 Results and Discussion:

Figure 8 displays the current patch size distribution across Bulkley TSA. Table 3 and Figure 9 present the results from current and "near future" (i.e. by the completion of recently proposed development) patch size analyses.

Table 3 – Comparison of Current and Near Future Patch Size Distribution against LUP Objectives

Landscape Unit	NDT	Small Patch Objective (%)	Current % (as of 2000)	Near Future % (by 2009)	Medium Patch Obj (%)	Current %	Near Future %	Large Patch Obj (%)	Current %	Near Future %
Babine	2	30-40	4	6	30-40	3	4	20-40	7	14
	3	10-20	8	10	10-20	11	16	60-80	11	12
Blunt	2	30-40	7	7	30-40	3	6	20-40	9	16
	3	10-20	5	7	10-20	12	14	60-80	22	22
Bulkley*	1	30-40	0	0	30-40	0	0	20-40	0	0
	2	30-40	11	19	30-40	11	13	20-40	9	9
	3	10-30	15	15	10-30	18	19	50-80	16	16
Chapman	2	30-40	4	5	30-40	3	6	20-40	15	25
	3	10-20	5	5	10-20	18	17	60-80	30	35
Copper	1	30-40	4	6	30-40	3	5	20-40	1	4
	2	30-40	8	9	30-40	7	8	20-40	1	6
	3	10-30	15	15	10-30	11	15	50-80	0	0
Corya	1	30-40	1	1	30-40	0	0	20-40	7	7
	2	30-40	10	12	30-40	4	4	20-40	6	6
Deep Ck	2	30-40	0	0	30-40	0	0	20-40	0	0
	3	10-20	10	11	10-20	5	5	60-80	0	0
Harold Price	1	30-40	0	1	30-40	0	0	20-40	0	0
	2	30-40	2	5	30-40	1	6	20-40	2	2
	3	10-20	3	6	10-20	7	8	60-80	20	21
Kitseguecla*	1	30-40	5	5	30-40	1	1	20-40	0	1
	2	30-40	5	6	30-40	12	12	20-40	18	20
Nilkitkwa	2	30-40	3	3	30-40	2	1	20-40	0	15
	3	10-20	3	10	10-20	3	10	60-80	0	9
Reiseter	2	30-40	7	8	30-40	3	5	20-40	16	22
	3	10-20	13	16	10-20	18	23	60-80	0	0
Telkwa	1	30-40	7	6	30-40	15	21	20-40	0	4
	2	30-40	4	6	30-40	2	5	20-40	0	6
	3	10-20	6	7	10-20	16	17	60-80	11	15
Torkelson	2	30-40	3	4	30-40	7	4	20-40	4	16
	3	10-20	6	6	10-20	17	15	60-80	17	26
Trout Ck	1	30-40	10	15	30-40	0	0	20-40	0	0
	2	30-40	13	13	30-40	11	10	20-40	22	28
	3	10-20	25	29	10-20	33	33	60-80	0	0

* Bulkley and Kitseguecla landscape units and objectives are not approved. Figures shown in table are for information only.

Source: Biodiversity Indicators in the Bulkley Landscape Units, Appendix 3

2.6.4 Recommendations

In summary, for NDT's highlighted in yellow in Table 3:

- Trout Creek NDT3 – the small and medium patch size objectives have been exceeded, and the large patch objective under achieved. Achievement of the large patch objective is infeasible because of the small timber harvesting landbase (THLB) size for NDT3 (500 ha). It is recommended that licensees avoid harvest in NDT3 for the balance of the rotation, and concentrate harvest in small and medium patches in NDT 1 and 2 (within objective limits).
- Reiseter NDT3 - the medium patch size objective would be exceeded if near-future harvest was conducted as proposed. A recommendation has been made to licensees that they withdraw certain proposed blocks and aggregate recently harvested medium patches into large patches.

In summary, for NDT's highlighted in green in Table 3:

- objectives are achieved for one or more patch size types (or will be following completion of near-future harvest). It is recommended that future harvest proposals target those patch size types where objectives have yet to be achieved.

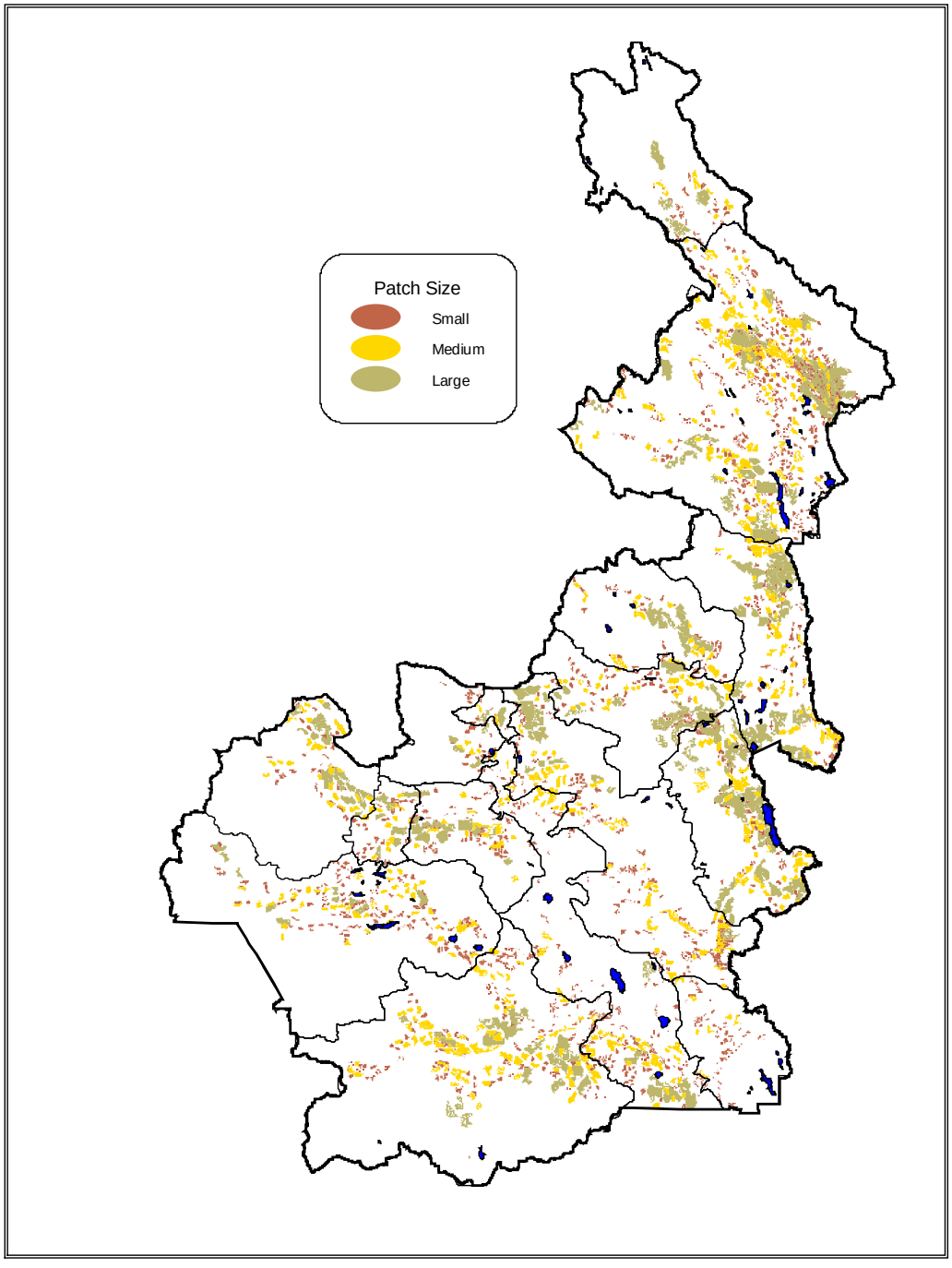
None of the remaining NDT's have achieved patch size objectives. This is an artefact of the definition for a patch: patches are comprised only of recently disturbed areas, and some NDT's have low levels of disturbance at present. The intent is that objectives will be achieved over time as more and more of the NDT becomes disturbed

As more of the forested landbase is developed or disturbed in future years, it will become clearer if meeting the large patch objective is feasible. Topography, timber types, development emphasis and social values may make achievement impossible. Effort shall be made in future analyses to assess the feasibility of large patch objectives, with the aim of potential modification to address localized conditions.

2.6.5 Data Sources:

- Ministry of Sustainable Resource Management. October 23, 2001. Biodiversity Indicators in the Bulkley Landscape Units; Part 1: Landscape Level Analysis.
- TSR3 dataset (includes forest cover data current to December 2000)
- Biodiversity Guidebook (September 1995)

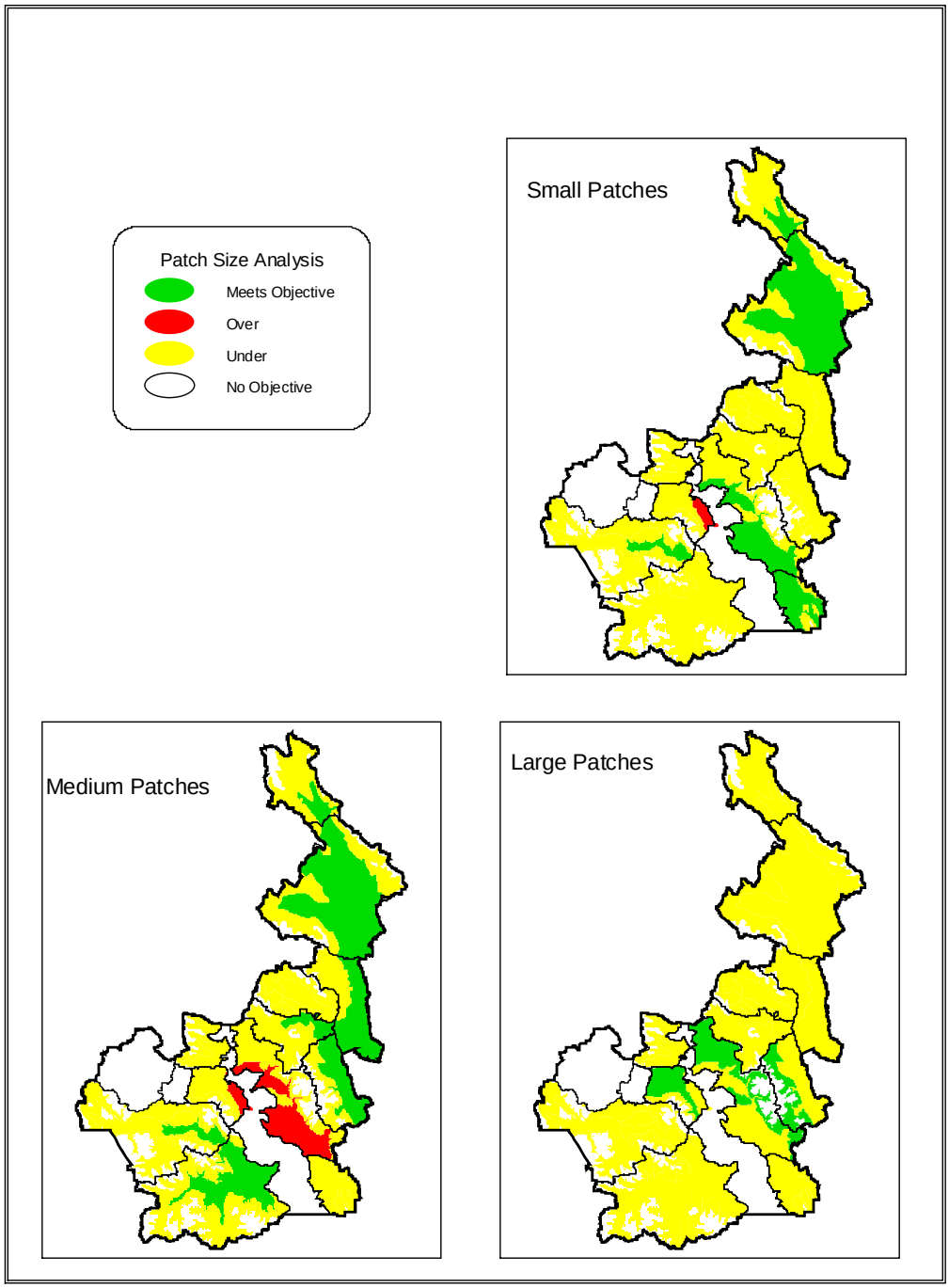
Figure 8 - Patch Size Distribution Across the Bulkley TSA



[1] Incorporates 2000 Forest Development Plan data.

Source: Biodiversity Indicators in the Bulkley Landscape Units

Figure 9 - Analysis of Patch Size Distribution



Source: Biodiversity Indicators in the Bulkley Landscape Unit