British Columbia
2009 Spotted Owl Management Plan
(SOMP 2)

RATIONALE FOR REVISIONS TO THE 1997 SPOTTED OWL MANAGEMENT PLAN (SOMP 1)

Presented to

The Director General
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1. Comparison of three indicators for SOMP 1 and SOMP 2

SOMP 1 and SOMP 2 have been compared on three broad levels:

- ***In relation to the limitations of SOMP 1***;
- ***The amount of protected / managed habitat*;**
- ***The potential number of Spotted Owl territories over time*; *and***

1.1. Limitations of SOMP 1

Note: SOMP 1 was designed to manage and sustain existing owls with forest rotation, whereas SOMP 2 is designed as a recovery plan, with habitat conditions improving over time and as the owl population increases.

Potential Inclusion of High Elevation Non-Suitable Habitat
Under SOMP 1, the upper elevation limit of suitable habitat was defined as 1,350m and includes forest within the Mountain Hemlock (MH) and Engelmann Spruce-Subalpine Fir (ESSF) Biogeoclimatic Zones. A review of Spotted Owl detections and telemetry results suggests Spotted Owls do not utilize these high elevation habitats. As most forests found in the MH and ESSF are older than 100 years, those portions within the SOMP 1 area may bias the percentage of owl habitat by suggesting that more suitable habitat exists than potentially does. Since clear-cut harvest opportunities in SOMP 1 depend on a "67% forest retention requirement", this bias results in increased opportunities for clear cut harvest and potentially lower (below 67%) amounts of habitat being retained for owls.

Ongoing Timber Harvest of Good Spotted Owl Areas
About half of the areas managed under SOMP 1 currently contain less than the minimum target of "67% forest retention". It is estimated that it may take 40 to 60 years for most areas to attain this target. It may also take as long to determine whether or not "67% forest retention" is sufficient to sustain a viable population of Spotted Owls. In the mean time, those areas with greater than 67% of the forested stands older than 100 years and found outside of protected areas would continue to be harvested down to the "67% retention" requirement. In essence, we were harvesting our good Spotted Owl sites and protecting our poorest Spotted Owl sites.

Long-Term Owl Habitat Area Establishment
To reduce overall timber supply impacts associated with SOMP 1, the Long Term Owl Habitat Areas (LTOHA) were established to optimize overlaps with existing forestry constraints and non-merchantable forests. This included forest at high elevation and/or with low productivity. Conversely, the Forest Management Areas (FMA) were largely established in low-elevation productive forests. In comparison, the FMA were generally composed of higher quality habitats (existing or capable) than found in the LTOHA.

Replacement Area Trade-off
Replacement Areas within the FMA are released at the rate at which forest stands reach 100 years in the LTOHA. These released RPA were typically older than forests for which they were traded for. As Spotted Owls select old forests (>140 yrs) over younger forests, this RPA trade-off strategy exchanges higher quality habitats for lower quality habitats. Although small trade-offs may have negligible impacts to owls, large scale trade-offs within a short period of time could have unintended consequences to Spotted Owl habitat.

Matrix Activity Centre Phase-out Strategy
Unlike other areas managed for Spotted Owls, the Phase-out Strategy managed Spotted Owls in a landscape by deliberately decreasing amounts of suitable habitat. As such, it was anticipated that Spotted Owls would disappear from these landscapes well before the end of the Phase-out Strategy in 2047. Although the MACs provide some habitat benefits to support owl dispersal, the overall benefit to species recovery decreases over time.

Range of Special Resource Management Zones
Spotted Owls have only recently been detected in the northern portion of the Chilliwack Forest District in the Nahatlatch and Ainslie Drainages. These areas possess relatively high suitable owl habitat values. However, due to the concern over additional timber supply impacts, these areas were not incorporated into SOMP 1. As such, an important portion of the species range was not adequately protected and, as seen in more recent surveys, may sever the link between owls found in the Chilliwack Forest District and owls found further north in the Cascades Forest District.

Connectivity
Owl movement between areas is essential, however, SOMP 1 relied heavily on habitats captured by existing forestry constraints and including habitat protection from Landscape Unit planning (predominately Old growth Management Areas). In some landscapes (e.g. Fraser Canyon), these provisions may be adequate, however, in other landscapes (e.g. west side of Harrison Lake), these provision are likely inadequate to facilitate owl movements.

The Table below summarizes the concerns of SOMP 1 and describes how SOMP 2 will address those concerns through the improvements to the plan.

Table 1: SOMP 1 Limitations and SOMP 2 Improvements

Issue	SOMP 1 Limitations	SOMP 2 Improvements
Range of Spotted Owl	Areas in the northern portion of the range of Spotted Owl are not included.	Northern range of Spotted Owl is included.
Suitable Habitat Definition	Defined by upper elevation limit of 1,350 m and therefore includes unsuitable owl habitat in MH and ESSF. The inclusion of this unsuitable owl habitat inflates the 67% amount of forest retention.	Based on the upper boundary of the Coastal Western Hemlock (CWH) and Interior Douglas Fir (IDF) BEC zones.
Projected 50 year habitat supply (Cortex model)	Some LTOHA includes low priority Spotted Owl habitat over the next 50 years.	Moves 'high priority' Spotted Owl habitat into LTOHA.
Management of three owl sub-populations	Habitat distribution does not consider three sub-populations of owls.	Moves LTOHA into high priority sites to adequately protect the three sub-populations.

Issue	SOMP 1 Limitations	SOMP 2 Improvements
Recovery Strategy targets (125 territories)	SOMP 1 may not be capable of achieving the minimum 125 territories over time	LTOHA forest retention and increase in total LTOHA and WHA areas result in higher number of managed territories and potential density of Spotted Owls.
SARA	SARA legislation was not in effect. Areas now defined as critical habitat continued to have some timber harvesting.	SOMP 2 provides for 100% forest retention* in LTOHA throughout the Spotted Owl range.
Consistency with the US Spotted Owl Plan	SOMP 1 is inconsistent with the US Plan by maintaining 67% forest retention and allowing harvesting.	SOMP 2 provides 100% forest retention* within the LTOHA, consistent with the US plan.
Connectivity	Mean distance between SRMZs/ WHAs is 15 km.	Mean distance between SRMZs/ WHAs is reduced.
Habitat enhancement	The anticipated level of habitat enhancement has not been achieved due to lack of funding.	SOMP 2 promotes enhancement practices through revised BMPs and recommends that the Habitat Team continues for 5 years to monitor and fund adaptive management practices that enhance habitat.
Timber harvesting in Spotted Owl areas	Supported harvesting in suitable habitat by trading off with young stands 100 years old.	100% LTOHA forest retention* protects suitable habitat and capable habitat in contiguous areas.
Distribution of LTOHA	Prioritizes constrained forest over the Spotted Owl habitat.	Prioritizes forested areas within the Spotted Owl habitat range as well as existing constraints.
Matrix Activity Centre phase-out.	Harvests suitable habitat within previously known or occupied territories over a 50-year period.	Eliminates the MAC concept. Priority areas within MACs are captured in the LTOHA.
Replacement Areas.	Areas of suitable habitat are temporarily deferred from 1 to 80 years and are traded off once unsuitable habitat in LTOHA becomes suitable.	Eliminates RPA and uses provisions to protect Spotted Owl habitat within LTOHA*.
Complexity of the SOMP.	SOMP 1 includes complex zonation, associated practices and approvals (e.g. LTOHA, FMA, RPA, RCA, MAC).	Simplifies zoning to LTOHA and FMA.
Spatial protection in the Cascades Forest District.	2,100 of 5,000 ha were spatially designated in WHAs (2006).	All 5,000 ha are spatially designated as WHAs.
Enhancement in the LTOHA.	Enhancement is allowed in stands older than 140 years.	Enhancement is only allowed in unsuitable owl habitat (typically in stands < 140 years).

*Note: "100% forest retention" allows for habitat enhancement practices where this will result in a net benefit to Spotted Owl habitat within 20 years. The rationale is that not all LTOHA is currently 100% suitable for owls; habitat enhancement is intended to achieve desirable attributes in stands at an earlier stage than through natural succession.

1.2 The amount of protected / managed habitat

The total amount of area managed for Spotted Owls varies little between SOMP 1 (342,692 ha) and SOMP 2 (343,900 ha) due to the "no net loss" policy for both timber supply and Spotted Owl habitat, however, under SOMP 2, the amount of area managed at 100% forest retention increases substantially from SOMP 1.

Table 2: Total area managed under SOMP 1 (1997) and SOMP 2 (2009) within the Chilliwack, Squamish and Cascades Forest Districts

	SOMP 1				SOMP 2			
Designation	**Chilliwack Forest District (ha)**	**Squamish Forest District (ha)**	**Cascades Forest District (ha)**	**Total Area (ha)**	**Chilliwack Forest District (ha)**	**Squamish Forest District (ha)**	**Cascades Forest District (ha)**	**Total Area (ha)**
Protected Area/ GVRD	128,200	30,700	11,200	**170,100**	128,200	31,300	11,200	**170,700**
LTOHA	64,500	27,100	0	**91,600**	71,400	32,300	0	**103,700**
WHA*	0*	0*	10,592	**10,592**	0	0	20,700	**20,700**
FMA or MFHA	33,300	17,400	0	**50,700**	27,100	21,700	0	**48,800**
Matrix Activity Centre	15,500	4,200	0	**19,700**	0	0	0	**0**
Total	**241,500**	**79,400**	**21,792**	**342,692**	**226,700**	**85,300**	**31,900**	**343,900**

*WHA figures in the Chilliwack Forest District are included under other designations. SOMP 1 WHA figures for the Cascades Forest District are since June 2006 only.

Significantly, under SOMP 2, more *suitable* habitat is captured within the LTOHA, thus affording a higher level of habitat protection than under SOMP 1.

Table 3: Distribution of Suitable Habitat (forests >100 years old) within the Chilliwack and Squamish Forest Districts.

Designation	**SOMP I Chilliwack Forest District (ha)**	**SOMP II Chilliwack Forest District (ha)**	**Difference (SOMP II minus SOMP I)**	**SOMP I Squamish Forest District (ha)**	**SOMP II Squamish Forest District (ha)**	**Difference (SOMP II minus SOMP I)**
Protected Area/GVRD	83,900	83,900	0	22,200	22,700	500
LTOHA	37,300	45,600	8,300	22,100	23,700	1,600
FMA or MFHA	13,300	12,600	-700	9,900	11,800	1,900
Matrix Activity Centre	8,500	0	-8,500*	2,500	0	-2,500*
Total	**143,000**	**142,100**	-900	**56,700**	**58,200**	**1,500**

*Note: an apparent reduction in suitable habitat occurs due to the removal of MACs, however, these areas were destined to be removed under SOMP 1.Nevertheless, a high percentage of these areas is considered inoperable forest, thus has low potential to be harvested, and will remain available for Spotted Owls.

3. The potential number of Spotted Owl territories over time

The CSORT minimum population goal of 250 mature Spotted Owls roughly translates into an amount of habitat that can sustain 125 territories, assuming each territory is occupied by a pair of adult Spotted Owls. This number does not account for additional, single, non-territorial adult owls (floaters), nor does it account for a potential overlap of territories which may be up to 25% of the area. Both these cases would result in a higher population number.

The median territory size of pair of Spotted Owls under SOMP I is estimated to be 3,000 ha based on the median home range size for Spotted Owls found in the western Cascade Mountains in Washington State. However, the size of each territory varies depending on the amount, distribution and quality of habitat. Typically, smaller home ranges have greater quantity and quality of habitat. As well, territory sizes vary by ecosystem, with larger home ranges in wetter ecosystems and smaller home ranges in dryer ecosystems.

Given the variability in territory sizes, a range of territory sizes has been used to estimate the number of potential territories that could be established under SOMP I and SOMP 2. The minimum territory estimate assumes that each owl pair requires exclusively 3,000 ha (see Table 4). The maximum territory estimate assumes that each owl pair only required exclusively 2,000 ha.

Under each management plan, *current* habitat conditions (i.e. average of 67% suitable habitat) likely support the minimum territory estimates. Hence, SOMP I and SOMP 2 may support 107 and 98 potential territories respectively in the short term. The smaller number of potential territories under SOMP 2 is due to the exclusion of the Managed Future Habitat Areas, however, these potential territories may be better distributed than under SOMP 1 and thus more likely to be occupied. Although Spotted Owls may live in the MFHA, these areas are not managed to support current owl populations. Conversely, under SOMP I, Forest Management Areas are integrated with LTOHA and protected areas within each potential territory, and provide greater support to current owl populations.

As habitats conditions within the 100% retention areas (LTOHA/protected areas) increase and improve over time (i.e. exceed 67% habitat retention) they are expected to result in smaller home range sizes required by Spotted Owls. Thus, the number of potential territories should increase towards the maximum territory estimate. As SOMP I maintains about half of the managed habitat areas at 67% suitable habitat, over time the number of potential territories within these areas likely will not increase, compared to SOMP 2. Therefore, SOMP 2 provides a greater likelihood of providing sufficient habitat to support 250 or more mature Spotted Owls over time.

Table 4: Comparison of the number of potential territories that may be established under SOMP I and SOMP 2.

	Minimum number of potential territories (3,000 ha)			Maximum number of potential territories (2,000 ha)		
Management Plan	**100% Retention**	**67% Retention**	**Total**	**100% Retention**	**67% Retention**	**Total**
SOMP I (all habitat areas)	159,800 ha	163,200 ha	323,000 ha*	159,800 ha	163,200 ha	323,000 ha
	53	54	**107**	80	54	**134**
SOMP 2 (LTOHA and protected areas only)	294,700 ha	0 ha	294,700 ha	294,700 ha	0 ha	294,700 ha
	98	0	**98**	147	0	**147**

*This figure does not include Matrix Activity Centres, as they are not expected to contribute to territories.

2. Summary of SOMP 2 Best Management Practices

Best Management Practices (BMPs) provide management targets for creating and/or enhancing Spotted Owl habitat, and guidance for general forest management in Special Resource Management Zones (SRMZs). BMPs replace the SOMP 1 operational guidelines and will provide the basis for developing General Wildlife Measures as Wildlife Habitat Areas (WHAs) are established under SOMP 2. This section provides a brief summary of the BMPs and a comparison with the SOMP 1 operational guidelines.

Chilliwack and Squamish Forest District

In the Chilliwack and Squamish Forest Districts, two types of SRMZ are identified under SOMP 2 to manage forests for Spotted Owl habitat within the Crown forest: the Long-Term Owl Habitat Areas (LTOHA) and the Managed Future Habitat Areas (MFHA).

The purpose of the LTOHA is to provide habitat in which Spotted Owls can nest, forage, roost and disperse. Therefore, the management goal in the LTOHA is to conserve and restore suitable habitat. Habitat enhancement practices (HEP) are encouraged in the LTOHA to promote stands to develop desirable Spotted Owl habitat attributes at an earlier stage than through natural succession.

The purpose of the MFHA is to provide timber harvesting opportunities while retaining some structural attributes associated with Spotted Owl habitat so that in the future, if necessary, MFHA may replace the LTOHA if the latter is lost to natural disturbance. The management goal of the MFHA is to allow timber harvesting with some retention. Harvest with Retention Practices (HWRP) include retention of stand structural attributes such as large diameter trees, snags, and large coarse woody debris that cannot be easily created through managing young or mature forest stands.

Cascades Forest District
For the Cascades Forest District, the intent is to establish the LTOHA as WHAs with no harvesting and no additional (mainline) road construction. Over the next year, the Cascades Forest District will modify the existing BMPs to address forest health issues and fire management within the WHAs to reflect the drier ecosystem specific to the Lillooet TSA.

Comparison of BMPs between SOMP 1 and SOMP 2
In general, compared to the SOMP 1 operational guidelines, the SOMP 2 BMPs are structured to provide flexibility so that forest practitioners can achieve the management goals of the LTOHA and MFHA under a results-based regime. Each BMP has a clear rationale related to Spotted Owl requirements. SOMP 2 HEP replace SOMP 1 Light Volume Removal (LVR) and SOMP 2 HWRP replace SOMP 1 Heavy Volume Removal (HVR). Key changes and improvements include:

Superior owl habitat description
The SOMP 2 description revises SOMP 1 using new information including inventory and monitoring data collected from BC Spotted Owl habitat areas since SOMP 1. The BMPs reflect these revised habitat attributes related to stand density, wildlife trees, coarse woody debris amounts.

Management of superior owl habitat
In SOMP 1, harvesting was not permitted in stands greater than 100 years old whereas in SOMP 2, harvesting is not permitted in superior owl habitat areas. The reason is that some stands older than 100 years old may naturally be dense and would benefit from HEP to accelerate development of old growth attributes. HEP are encouraged in stands that are in the competitive stem exclusion phase, which typically occurs in stands less than 140 years old.

Under SOMP 2, HEP must result in a net benefit to Spotted Owl habitat in the short-term (≤ 20 years), while under SOMP 1, the net benefit to habitat may not be realized until the long-term. HEP do not focus on one habitat attribute at the expense of others, but represent a balanced, optimized prescription based on the current stand condition and the desired future Spotted Owl habitat attributes.

Guidance on road construction in the LTOHA
SOMP 1 permits road construction in the LTOHA without mitigating the permanent loss of habitat. In SOMP 2, road construction and clearings should be avoided, but where no practicable option exists, habitat enhancement is required to offset negative impacts.

Operational flexibility in the LTOHA
No more than 33% (under SOMP 1) and 40% (under SOMP 2) of the stand basal area in a block may be removed. SOMP 2 potentially allows for more tree removal but includes roads and other clearings as part of the total removal. Compared to SOMP 1, the minimum retained number of stems/ha is higher and the guidance is to leave larger trees, to create openings that mimic natural gaps, and to retain or create wildlife trees.

Operational flexibility in the MFHA
Most of the SOMP 1 guidance for managed forest areas is the same under SOMP 2, and rationales and examples are provided in the document. One notable change is to consider retaining existing wildlife trees (including snags) as part of the retention in the block. The SOMP 1 large snag retention requirement has been removed because the retention amount may not exist on the block.

3. Model Assessment of SOMP 1 and SOMP 2

Reference: Summary of Key Modelling Points: Strategic-level Modelling Analyses of SOMP 2 (Sutherland et al. 2008).

The Habitat Team used the habitat model develop for the CSORT to evaluate and compare the habitat quality of SOMP 1 and SOMP 2 using three indicators:

- amount of nesting and foraging habitat (fine-grained)
- number and size of territories (medium-grained), and
- landscape connectedness (coarse-grained).

Indicators from the two plans were compared and interpreted relative to one another. Indicators were projected and compared for three time periods: current (2008), 20 years (2028), and 50 years (2058). Three time periods were used to take into account how forest growth and harvesting will affect habitat recruitment and availability under the differing plans.

The project included an additional comparison between the two plans and a previously modelled projection of best biological reserve locations based solely on owl biology and habitat requirements, i.e., without THLB restrictions (Sutherland et al 2007).

Benefits of SOMP 2 compared to SOMP 1

- SOMP 2 gains 2.1% total suitable habitat compared to SOMP 1 over the 50 year projection. Note that large gains were not expected because of the 'No Net Loss Rule' for both habitat and timber supply.
- SOMP 2 gains 2.7% more area classed as higher quality habitat (suitable for both nesting and foraging instead of only foraging) compared to SOMP 1 by 50 years. These gains, in part, reflect the shift to full retention of long term habitat in LTOHA (8.5% gain in long term habitat). Note that age is used as a management surrogate for habitat quality under the habitat definition. Additional associated management practices in FMAs (not modelled) may improve the combined total gains in habitat for SOMP 2. Long term protection of habitat in the LTOHA ensures that habitats exceed over time the minimum acceptable age surrogate for habitat, while the floating "67 %" rule of SOMP 1 tends to manage towards the minimum age surrogate for suitable habitat.
- Specific to the Chilliwack Forest District there is a slight gain (~ 1%) in suitable habitat (i.e., both nesting and foraging) by year 50.
- SOMP 2 supports 6.8% more territories compared to SOMP 1 by year 50. Of the three Districts, numbers of projected territories differed <u>least</u> between the two plans for the Chilliwack Forest District.

- SOMP 2 supports more compact territories than SOMP 1. Smaller territories could reduce energetic requirements for territorial owls and improve survival and reproduction.
- SOMP 2 slightly improves overall connectivity over SOMP 1 by year 50. Connectivity is important for dispersal and pairing behaviours.
- SOMP 2 compared to SOMP 1 better represents, and captures in protected areas the distribution of the best biological reserves by (Sutherland et al. 2007) based on the area intersected and numbers of reserves.

Limitations of SOMP 2 compared to SOMP 1

- SOMP 2 may support fewer territories than SOMP 1 at year 20 because of slightly poorer habitat connectivity in this period. This mid-term short-fall for SOMP 2 disappears by year 50 suggesting it may be due to shifting management approaches and landscape adjustment to external planning objectives. It is most apparent in the Squamish Forest District.
- Territory distribution differs between the two plans by year 50 and may be more constrained under SOMP 2 because of the different management approaches i.e., SOMP 2 (100% LTOHA and FMA) compared to SOMP 1 (floating 67%).

Summary

In general, habitat management is improved under SOMP 2 compared to SOMP 1. The lack of substantial differences was not unexpected given the strategic scale of testing, the scale of proposed changes between the two plans, and the lack of fully recalibrated timber harvesting assumptions for SOMP 2. Regarding the latter point, the model may spread out harvesting more than it would with recalibration, thus reducing connectivity and territory packing for SOMP 2 and producing more conservative numbers.

Importantly, results suggest that under SOMP 2 higher quality habitat will be obtained for Spotted Owls in the long-term compared to SOMP 1. The trade-off of this increased habitat availability will be that locations of available habitat for the owl becomes more spatially constrained over time. Transitioning forest management approaches combined with the overall ongoing habitat decline will require, under any plan, careful coordination with population recovery actions, particularly over the next couple of decades.