Preliminary Biological Assessment of the Rip Tide Timber Sale: Potential Impacts to the Tidewater Marbled Murrelet Management Area

Prepared by: Clint Smith JCS **Date:** 11 January 2005
Revised: 2 February 2005

Purpose

In the FY 2006 sale plan, Astoria District is proposing a sale (Rip Tide) that is partially (Areas 1 & 2, 207 of 284 total sale acres) within the West Tidewater Marbled Murrelet Management Area (MMMA, See Figure 1). The purpose of this Biological Assessment is to discuss the potential impacts of the proposed activities to the habitat and the murrelets potentially nesting within this MMMA.

Policy Direction

ODF's recently adopted Marbled Murrelet Operational Policies (effective 1 January 2005) require the involvement of an Area Biologist "in developing appropriate prescriptions for management proposed in a MMMA...consistent with procedure 1.1.P5.1" and considering the guidance within 1.1.G1.5. This guidance recognizes that "every MMMA is unique and there is no standard prescription for management activities in MMMAs. In general, management activities in MMMAs need to be consistent with the overall policy objectives of maintaining habitat suitable for successful nesting and minimizing the disruption of reproductive activities in marbled murrelet occupied sites." This guidance also gives many factors to consider when developing prescriptions, which I will not repeat in this BA. I have worked with Ty Williams in the development of the sale prescription, as required by the policy. I also intend to assist with on-the-ground sale layout, in identifying and posting patches of suitable nesting habitat and patches of developing habitat.

Survey Information

Marbled murrelet surveys within and near the West Tidewater MMMA have been conducted yearly between 1992-2004. The survey data are summarized in Table 1. Marbled murrelet presence was observed by the ODF contract surveyors in 1993, 1994, 1995, and 2000. Subcanopy behaviors were observed by the contract surveyors in 1993, 1994, and 1995. In addition, I conducted two surveys within the MMMA in 1998. My associate (Naomi Bentivoglio with the U.S. Fish & Wildlife Service) and I detected subcanopy murrelet behaviors on both of these surveys.

Because subcanopy detections have not been observed here since 1998, and presence has not been observed since 2000, it may be tempting to conclude that murrelets have abandoned this site for some reason. Figures 2-6 show survey station locations within and near this MMMA since 1997. Upon examining these figures, you should note that the last year that the MMMA was well covered by survey stations was 1997.

It is interesting that in 1998, there was a survey station near the location where Naomi and I observed subcanopy behaviors. Our surveys with subcanopy behaviors were on July 1 and July 9, 1998. The survey contractor surveyed the nearby station on July 6, 1998 with no detections. This illustrates the difficulty of detecting nesting murrelets using protocol surveys and the importance of proper station placement.

So, it should be clear that the contractor surveys conducted after 1997 do not provide reliable evidence of murrelet absence at the West Tidewater MMMA. The contractor surveys in 1998 had no detections, when other, site-specific surveys detected occupancy. Presence was detected in 2000 when only 3 stations were surveyed. There have been no surveys conducted in the northern portion of the MMMA since 1998 and none in the northwestern portion of the MMMA since 1997 (Figures 2-6). Therefore, when weighing the potential risks of the proposed Rip Tide sale, I will assume that this MMMA is used by nesting murrelets on at least some years.

Habitat Information

Defining Suitable Habitat. Research conducted on ODF ownership concluded that marbled murrelets selected large conifer trees with numerous platforms for nesting. Nests were located on larger diameter platforms with more moss, more horizontal cover, and closer vertical cover than non-nest platform trees available in nesting sites (Nelson and Wilson 2001). The researchers also found that murrelets frequently nested within patches (or micro-sites) of high quality surrounded by lower quality (or non-habitat) within the MMMAs where the research took place. Based upon the results of this research, it is possible to make on-the-ground identification of patches of high quality murrelet habitat and patches of developing habitat.

Stand Condition. The West Tidewater MMMA includes several stand types, ranging in age from about 50 years to over 100 (Figure 1). The predominant tree species in most of the stand types is western hemlock, but red alder predominates in some of the types in the northwestern portion of the MMMA. Douglas-fir and Sitka spruce also are present within these stands.

Suitable marbled murrelet habitat within this MMMA occurs at the patch level, not at the stand level. Patches of high quality nesting habitat (usually open-grown western hemlock infected with dwarf mistletoe) are separated by a matrix of dense timber with few suitable nest platforms. The approximate locations of these suitable habitat patches are illustrated in Figure 1. Please note that this mapping was largely based on aerial photo analysis with a limited amount of ground-truthing. Some of the marked patches may actually be developing habitat, rather than currently suitable. Additional field work will be necessary to accurately locate all of the developing and suitable habitat patches on the ground.

Landscape Condition. Figure 7 shows the MMMAs currently established on ODF ownership within and near Astoria District. From this figure, it is apparent that there are relatively few known occupied sites on ODF ownership, and that they impact a relatively small percentage of the ownership. There undoubtedly still are patches of occupied habitat that have not yet been discovered, but the potential for locating these decreases yearly as additional areas are surveyed. Available evidence also indicates that the MMMAs in Astoria District are not consistently used year-after-year by murrelets, so some habitat patches that have been surveyed with no detections actually may be occupied by murrelets during some years. Areas with relatively high detection rates in the mid-90's have been surveyed in the current decade with few, if any, detections. It is possible that the habitats in Astoria District are used periodically, possibly linked to ocean conditions, but there is insufficient information to draw good conclusions.

Cumulative Impacts. To date, there have been three planned and completed commercial forest operations within a MMMAs on ODF lands in Northwest Oregon Area: Coal Creek Thinagin in Tillamook District (completed in the late-'90s), Two Coals in Tillamook District (FY '05), and Simmons Ridge in Astoria District (FY '05). Approximate locations are shown in Figure 7.

- Coal Creek Thinagin was a commercial thinning that thinned the non-habitat surrounding the patches of suitable nesting habitat within the MMMA. In this thinning, considerations were taken to protect existing murrelet habitat, including location of cable corridors and seasonal operational restrictions during the murrelet nesting season. Murrelet subcanopy behaviors have been observed within the Coal Creek MMMA after the thinning was completed, including behaviors associated with nesting behavior. Detections within this MMMA have dropped off in recent years, but this is consistent with a general decline in murrelet detections at all North Oregon Coast sites on ODF ownership.
- Two Coals also is planned within the Coal Creek MMMA. This sale will thin some fringes within the MMMA that do not contain high quality murrelet nesting habitat.
- The Simmons Ridge sale will thin non-habitat within the Simmons Ridge MMMA. In addition, the two patches of high-quality habitat within the MMMA were marked for harvest with the intent of opening suitable and developing nest trees to maintain growth, vigor, and platform growth. This area was identified for a more aggressive prescription within the suitable habitat, because recent intensive surveys within the MMMA have not detected murrelet presence for the past several years.

There is another commercial operation planned in Astoria District's FY 2004 Annual Operations Plan (West Green Mountain Combination) in an area where subcanopy murrelet behavior was detected, but a MMMA was not established. This clearcut harvest buffered (no harvest area) the suitable habitat where the subcanopy detection was observed, in an attempt to maintain the viability of this small patch of nesting habitat.

Sale Prescription

Areas 1 and 2 of the Rip Tide sale include 207 acres within the 414 acre West Tidewater MMMA. The following discussion is from Astoria District's Preliminary 2005 Annual Operations Plan:

> "These stands will be thinned to a basal area range of 160-180. SDI 35 – 40%. This prescription will promote growth towards the desired future condition of layered, and eventually on to older forest structure. The large dominant trees and trees with mistletoe and limbs greater than 5" in diameter will be retained. Alternative thinning prescriptions will be applied at a "patch" scale to create variability in the stand and promote habitat for marbled murrelets in Areas 1 and 2. Patches of developing habitat will be determined with assistance of the NW Area Biologist and will be posted as marked thinning areas in order to promote growth, and further enhance their habitat characteristics. Pockets of existing marbled murrelet habitat will be excluded."

Assessment

Anticipated Thinning Impacts.

Short-term. The short-term impacts of the planned harvest prescription on murrelet habitat suitability are unknown. Potential risks include increasing population levels of predators in the stand, increasing predator access to nest cups, physical damage to nesting platforms, and blowdown.

- Predator populations. Both De Santo and Willson (2001) and Luginbuhl (2001) correlated nest predator abundance (corvids) with depredation rates on artificial nests in hydric western coniferous forests. It is unlikely that over the short term, the thinning harvest will increase predator levels within the stand. Studies in Oregon on short-term impacts of thinning on bird populations either have not observed enough jays or crows during the breeding season to analyze the data (Hagar et al. 1996), or have detected no significant differences between the thinned and unthinned stands (Hayes et al. 1998).

  Avian nest predation rates generally increase in forest-edge landscapes located within 3 miles of human development (housing, industry, agriculture, dumps, etc.) (Andren 1992, Song and Hannon 1999, Sieving and Willson 1999, Steventon et al. 1999, Kurki et al. 2000, Kosinski 2001, and Rodewald 2002). Harvest of the proposed Rip Tide sale will not increase the amount of clearcut/forest edge in the immediate vicinity of the MMMA.

- Predator access. If the harvest prescription were to remove trees adjacent to nest limbs that help to provide cover to the nest, then murrelets nesting on these limbs may be more vulnerable to predation (less hidden). The intent of the proposed management prescription is to identify suitable nesting habitat within the MMMA and post the habitat patches and small buffers as no-harvest areas. If we are successful in identifying and buffering all of the habitat patches, then the operation should not result in increased access for predators.

- Physical damage to nesting platforms. If we are successful in identifying and buffering all of the habitat patches within the MMMA, then there should be no physical damage to nest trees or platforms as a result of the harvest activity.

- Blowdown. The existing stand is fairly dense. There was a windthrow event within the southern portion of the MMMA in the mid-'90s. It is likely that there will be some amount of blowdown after the stand is opened up by the thinning, but the amount of actual windthrow is not possible to anticipate. The murrelet habitat patches have more open canopies, so the greatest danger of blowdown likely is within the adjacent non-habitat, rather than the actual likely nest trees.

Long-term. Over the long term, the proposed management prescription is designed to be the first step toward moving the stand toward the desired future condition of Older Forest Structure. Currently the stand is dense, and structure development is progressing very slowly. Thinning the stand should open it sufficiently to allow establishment of a tolerant understory cohort, the first step toward developing layered stand structure. Further

entries may be necessary in the future (after the trees develop better windfirmness) to allow further development of the understory.

Development of a tolerant conifer understory may ultimately lead to an increase in potential corvid predators nesting within the treated MMMA stand (John Marzluff, University of Washington, pers. comm.). It likely would take additional disturbance (repeated thinnings, windthrow, etc.) to create sufficient growing space to develop layering sufficient to attract nesting corvids. Since murrelet nesting is common in old-growth stands that contain conifer understory, it is possible that the structure of the nest tree (in providing nest cup cover) is more important in determining potential corvid nest predation rate than is the structure of the surrounding stand.

If successful with this prescription within the developing habitat niches, the long-term effects of the harvest would be to increase habitat suitability within these niches. The intended long-term effects of the prescription are to increase growth of platforms and cover around these platforms, and to improve marbled murrelet access into developing platform trees.

Risk Assessment

The proposed harvest of Area 1 and 2 of the Rip Tide timber sale will modify non-suitable habitat within the West Tidewater MMMA. There are suitable habitat patches scattered throughout the MMMA and the sale area. Potential impacts to nesting habitat will be minimized by posting area boundaries around identified habitat patches. Scattered platform trees outside of the identified patches will be protected by contract language protecting trees with limbs >5" diameter. Within identified habitat patches, there will be no harvest. Within patches of developing habitat, trees will be marked for harvest if removal is necessary to enhance platform development, cover around platforms, and/or access to platforms. This should enhance long-term development of suitable marbled murrelet habitat. Seasonal operating restrictions will be required to avoid disturbance to nesting murrelets.

Short-term risk to murrelets may occur in the form of damage to nest platforms. This will be minimized to the maximum extent possible. Windthrow after the harvest also is a possibility.

Long-term risk to murrelets may occur by increasing habitat suitability for corvid nest predators. However, the management prescription also is designed to increase cover around developing nest platforms, which may allow nesting murrelets to better conceal their nests from predators.

Harvest activities will occur adjacent to several patches of suitable nesting habitat. Impacts of the activities are largely unknown; the preceding discussions on risk assessment are largely speculative and not based upon research data. Rip Tide is the 2nd sale proposed within an Astoria District MMMA within the past two years. There are 12 identified MMMAs within Astoria District, so this represents management within 17% of the Astoria District MMMAs over two consecutive sale plans.

Because of the proximity of the harvest to suitable murrelet nesting habitat, the largely unknown impacts of the harvest activities to habitat and murrelet use/success within the habitat, and the relatively high percentage of MMMAs impacted over two consecutive sale plans, I cannot conclude this activity has a low risk. Conversely, measures will be implemented to minimize risk to the murrelets and their habitat, and to accelerate development of additional suitable habitat within the MMMA so I also would not rank this as a high risk.

I anticipate that harvest of Rip Tide poses a 'Moderate' risk to viability of the West Tidewater MMMA. Because the suitable habitat patches are scattered throughout most of the MMMA, I cannot think of additional ways to reduce risk to the birds other than removing areas located within the MMMA.

Consultation with ODFW

Herman Biederbeck, ODFW wildlife biologist, has reviewed a draft of this biological assessment. His comments are included as Attachment 1.

Literature Cited

Andrén, H. 1992. Corvid density and nest predation in relation to forest fragmentation: a landscape perspective. Ecology 73:794-804.

De Santo, Toni L., and Mary F. Willson. 2001. Predator abundance and predation of artificial nests in natural and anthropogenic coniferous forest edges in southeast Alaska. Journal of Field Ornithology 72(1):136-149.

Hagar, J.C., W.C. McComb, and W.H. Emmingham. Bird communities in commercially thinned and unthinned Douglas-fir stands of western Oregon. Wildlife Society Bulletin. 24(2):253-366.

Hayes, J.P., J.M. Weikel, and M.D. Adam. 1998. Chapter 5: Abundance of breeding birds. In: Effects of commercial thinning on stand structure and wildlife populatins: a progress report, 1994-1997. Coastal Oregon Productivity Enhance Program. College of Forestry, Oregon State University. Corvallis, OR. 150 pp.

Kosinski, Ziemowit. 2001. Effects of urbanization on nest site selection and nesting success of greenfinch (*Carduelis chloris*) in Krotoszyn, Poland. Ornis Fennica 78(4):175-183.

Kurki, Sami, Ari Nikula, Pekka Helle, and Harto Linden. 2000. Landscape fragmentation and forest composition effects on grouse breeding success in boreal forests. Ecology 81(7):1985-1997.

Luginbuhl, John M., John M. Marzluff, Jeffrey E. Bradley, Martin G. Raphael, and Daniel E. Varland. 2001. Corvid survey techniques and the relationship between corvid relative abundance and nest predation. Journal of Field Ornithology 72(4):556-572.

Nelson, S.K. and A.K. Wilson. 2001 Marbled murrelet habitat characteristics on state lands in western Oregon. Final Rep., OR Coop. Fish and Wildlife Research Unit, Oregon State Univ., Dept. Fisheries and Wildlife, Corvallis. 159 pp.

Rodewald, Amanda D. 2002. Nest predation in forested regions: landscape and edge effects. Journal of Wildlife Management 66(3):634-640.

Sieving, K.E., and M.F. Willson. 1999. Nest predation and avian species diversity in northwestern forest understory. Ecology 79:2391-2402.

Song, Samantha J., and Susan J. Hannon. 1999. Predation in a heterogeneous forests: a comparison at natural and anthropogenic edges. Ecoscience (4):521-530.

Steventon, J. Douglas, Peter K. Ott, and Kenneth L. Mackenzie. 1999. Effect of partial cutting on predation risk to artificial bird nests. Canadian Journal of Forest Research. 29(12):1911-1915.

cc: Ty Williams, Astoria
Ron Zilli, Astoria
Tom Savage, Astoria
Diana Ison, Astoria
Marcia Humes, Salem
Mike Bordelon, Forest Grove
Nancy Hirsch, Salem
Mitch Taylor, Forest Grove
Jim Paul, Salem
Herman Biederbeck, ODFW, Tillamook

Attachment 1

SMITH Clint J
From: BIEDERBECK Herman H
Sent: Monday, January 10, 2005 3:57 PM
To: SMITH Clint J
Subject: Comments on draft Rip Tide BA

Clint,

I reviewed the draft Preliminary BA of the Rip Tide Timber Sale:
Potential Impacts to the Tidewater MMMA, and concur with your assessment that the proposed sale poses a moderate level of risk to the MMMA. With patches of suitable murrelet habitat scattered throughout the MMMA , the only way to further minimize risk is to reduce the amount of the sale within the MMMA. I also agree that if the sale proceeds as planned, the measures to minimize impacts to habitat patches within the sale areas will be necessary.

Herman