
INTRODUCTION

This memorandum supplements the Humboldt Wind Energy Project Marbled Murrelet Habitat Assessment and Auditory and Visual Disturbance Analysis Report (Stantec 2018; hereafter the report). Herein, we provide a figure depicting the three stands that were determined to provide habitat for nesting marbled murrelets (Stands 76, 63, and 64) and the two stands determined to provide low quality habitat for murrelets (Stands 66 and 68) in the initial report. We also provide a refinement of the characterization of one of the previously investigated stands (Stand 66) relative to potential extent of habitat that could be used by marbled murrelets. Further, we provide an assessment of background ambient noise associated with the portion of the project area near Highway 101. Finally, we provide recommended changes based on the findings of this noise assessment to Mitigation Measure 3.5-1b: Avoid Indirect Impacts on Nesting Marbled Murrelet (copied below) included in the project Draft Environmental Impact Report (Draft EIR; Humboldt County, 2019) that details “no-disturbance buffers” to be maintained around mapped stands that have the potential to support nesting marbled murrelets. These recommendations are consistent with US Fish and Wildlife Service guidance for auditory disturbance to northern spotted owl and marbled murrelets (USFWS 2006).

As stated in the initial report, all five stands that have the potential to support nesting by marbled murrelets will be avoided, in accordance with Mitigation 3.5-1a: Minimize the Construction Footprint to Avoid Impacts on All Suitable Marbled Murrelet Nesting Habitat from the Draft EIR. The results of this assessment are consistent with conclusions of significance provided within the Draft EIR.

Mitigation Measure 3.5-1b: Avoid Indirect Impacts on Nesting Marbled Murrelet.

During the marbled murrelet nesting season (March 24–September 15), the project applicant shall maintain a no-disturbance buffer between the construction activity and marbled murrelet nesting habitat as described below. An exhibit showing the project improvements and marbled murrelet nesting habitat buffers shall be prepared demonstrating compliance with this mitigation measure. In the event the buffers cannot be maintained, an additional marbled murrelet shall be added to the compensatory mitigation required in Mitigation Measure 3.5-2c. The following auditory disturbance buffers shall be maintained between the construction activity and marbled murrelet nesting habitat:

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If implementation of the buffers described above is infeasible, the project applicant shall consult with CDFW and USFWS regarding an alternative buffer size. The project applicant shall provide documentation of concurrence from CDFW and USFWS to the Humboldt County Planning & Building Department for the alternative buffer size before issuance of construction permits.

The no-disturbance buffers included in Mitigation Measure 3.5-1b, and the initial habitat assessment report (Stantec 2018), assumed a conservative “very low” ambient noise level (51-60 dB) in the absence of project noise. The USFWS guidance on noise (USFWS 2006, Table 1) allows for use of different buffers than those included in theDraft EIR if the pre-project ambient noise is in the “moderate”, “high”, or “very high” categories. Ambient noise next to high-speed highways was described by the USFWS (2006) as in the “high” category (81-90 dB). Further, when compression brakes are being used by trucks on the highway, they can even reach the “very high” category (91-100 dB).

Three of the five stands mapped as potential habitat for nesting murrelets in the initial report (Stand 63, Stand 64, and Stand 66) are located immediately adjacent to Highway 101 and Stand 68 is located approximately 550 feet (168 m) south from the highway and almost 1312 feet (400 m) from the project boundary. Stands 63 and 64 are located on the opposite side of the highway from the project (Figure 1). Thus, existing noise occurring on Highway 101 is closer to stands 63 and 64 than the noise across the highway at the project site. Existing highway noise represents a very elevated background level during normal operational hours (eg: from road noise, engine noise, and jack-brakes on trucks, etc). This elevated ambient sound likely masks sound created on the project site. Noise contributed by the highway to the stands is increased because the highway is elevated (5 to 8 m) above the existing terrain (adjacent to stands 63, 64, and 66) and along the area adjacent to the proposed staging/operations area for the project. As such, additional investigations were completed to assess ambient sound levels on Highway 101 in order to inform the correct disturbance buffers to be observed at the project site for nearby Stands 63, 64, 66, and 68.

Stand 66 is located directly south of Highway 101 at the Jordan Road exit off-ramp from Highway 101, nearest to the project site entrance. In the initial 2018 report, Stantec identified Stand 66 as marginal murrelet nesting habitat based on aerial imagery, stand size, harvest history, and results of the field assessment conducted to support the initial report. It is a 31.8-acre (13.3 ha) remnant of what was a 145 acre (59 ha) stand in 1998. In the report, the narrative about the stand indicates that “the majority of the stand no longer provides reliable nesting habitat for murrelets”. Tree size averaged 23.2 inches (59 cm) dbh (diameter at breast height) in 2018 and was primarily composed of redwood. The stand contains a few large second growth trees, the largest of which was 67 inches dbh (175 cm); which is much smaller redwood than used for nesting by murrelets in northern California (average 105 inches; 267 cm; Golightly et al. 2009).

Due to the location of Stand 66, H.T. Harvey and Stantec biologists conducted a supplemental survey and analysis of the portion of this stand located within 300-meters of the project site to assess the potential for noise disturbance to nesting marbled murrelets and to validate the actual proximity of potential nesting habitat to the project footprint and to project noise sources. The original assessment used aerial photographic techniques to identify the widest possible extent the stand with follow up field assessments to validate tree sizes, tree types, and harvest history characteristics to confirm that the stand was possible for use by nesting murrelets. This supplemental assessment allowed refinement of the stand boundaries to ensure compliance with appropriate disturbance buffers. Stand 66 is not in proximity to any proposed turbine locations but is located adjacent to the site entrance and future operations and maintenance facility. There is no proposal for habitat alteration within the stand during construction; consequently, it is the possibility of noise disturbance that required a more detailed assessment.
METHODS

SOUND MEASUREMENT

Site specific quantitative measures of sound were obtained at three locations to assess the ambient noise level associated with Highway 101. One monitoring station for measurement was located between the highway and Stand 66 along the south-bound off-ramp. Another measurement site was south of Jordan Creek Road between the project staging area and the highway. The last site was across the highway adjacent to the old-growth forest. Each noise monitoring station was off the highway shoulder and approximately 7 m from the roadbed. Sound was measured midday on September 23, 2019. A digital type 1 sound meter (Model 407750, Extech, Waltham, Massachusetts) was mounted on a tripod 1m above ground and configured for ‘A’ weighting - slow). The meter was unobstructed by vegetation and the operator was 10m from the equipment during operation. Measurements occurred on a clear day with minimum wind (<5 mph). Each measurement session was 14 to 16 min with maximum recorded for every 2 minute interval. Each session occurred sequentially with 20 minutes between sessions.

STAND 66 REFINEMENT

The supplemental analysis of Stand 66 was done by conducting a tree-by-tree survey of the area within the 984 feet (300 m) of the edge of the proposed operations center. Each tree’s potential to support nesting was characterized based on tree size, characteristics, and potential platforms. Platforms are an essential element to support nesting (Evans –Mack et al. 2003) and generally occur only in large, very old trees. The objective of this survey was to determine the distance to the nearest potential habitat, if any, from noise generated at the projects proposed staging area/operations center.

Using GIS, a 984 foot (300 m) buffer was designated along the western edge of the project site. The dbh of all conifer trees larger than 36 inches (91 cm) were measured on June 11, 2019. The canopies of all trees larger than 39.4 inches (100 cm) were visually searched for limbs, or deformities, that could provide a flattened platform characteristic of murrelet nests. The portion of the stand beyond the buffer was not surveyed or assessed in this effort. Each of the trees greater than 39.4 inches (100 cm) dbh was located with GPS and documented (photographs and video). Large stumps that remained after previous harvests within the stand were similarly located and recorded.

RESULTS AND DISCUSSION

SOUND MEASUREMENT

Overall, sound levels ranged from 45.2 to 93.1 dB. The average was 79 ± 1.65 dB (mean ± SE) along the off-ramp, 87.2 ± 3.10 dB along the eastern side of the highway adjacent to old-growth, and 90.4 ± 1.39 dB adjacent to the most southern edge of the staging area. During the sampling sessions noise did not include any explicitly loud sounds such as compression brakes, emergency vehicles, or low flying aircraft. Thus, sound levels measured were consistent with the USFWS (2006) guidelines’ description of road noise and in the “high” or “very high” range along the section of Highway 101.
STAND 66 REFINEMENT

The area of Stand 66 within the 300-meter buffer zone did not contain any residual old-growth trees. Harvest of trees appeared to have occurred in this stand at least twice in the past. This is not surprising given that this stand is on commercial timber land, is easily accessed from the highway, and is close to the sawmill at Scotia. Most stems within the stand were sprouts from stumps. Redwood was and is the dominant tree species in the stand during both harvest and post-harvest periods. Fire had occurred in the stand at least once, and considering the state of stump sprouts, that fire probably occurred in the last 40-50 years.

All large trees (greater than 36 inches (91 cm)) were redwood. For the trees greater than 39.4 inches (100 cm) dbh, the stem diameters averaged 55 inches (140 cm). The largest tree was 69 inches (175 cm). However, dbh in the measurement was inflated relative to tree age because of stump re-sprouting (which is characteristic of redwoods after timber harvest). Actual measurement of individual stems was confounded by the re-sprouting. No reiterated limbs or notable deformities in the branches were observed in any of the trees in the buffer (this is typical of young redwood forests). No flattened limbs with epiphytes or moss (that commonly occur with platforms used by murrelets) were observed in any of the trees.

On one of the largest trees we found one limb that was flattened on top at a point adjacent to the main trunk, but lacked any epiphytes. The upper side of that limb could be visually inspected with binoculars from an elevated area of the adjacent roadway. This limb did not have any accumulation of tree debris, nor were epiphytes or moss present. The limb was relatively higher than most of the surrounding canopy, and was relatively exposed; this exposure can compromise successful nesting. The tree was 454 feet (138 m) from the edge of the future operations center and 502 feet (153 m) from the edge of highway 101.

CONCLUSIONS

A supplemental survey of Stand 66 was conducted, and the area surveyed did not contain any old growth. Given that the stand is located on commercial timberland and is younger second growth, the potential for future timber harvest is likely; these trees are unlikely to develop the characteristics of potential murrelet nesting habitat. The stand would be considered very marginal for murrelet nesting (and it could be argued given the small size and recent harvest that it would not support murrelets today). None of this marginal habitat, including the one tree with a potential platform was within 100m of the project footprint.

The average ambient noise along the highway was 87.2 and 90.4 dB, which describes ambient noise that is categorized as “high” or “very high” in the USFWS guidelines (USFWS 2006). Using Table 1 of the USFWS guidance, very high noise produced by the project results in a 50 m buffer around the project footprint. Given that the boundaries of Stand 66 were mapped at 100 m from project disturbance (Figure 1), there are no sound restrictions that are presently warranted in the project footprint in the vicinity of Stands 66 and 68 from one hour after sunrise to one hour before sunset, except for avoidance of extreme or impulsive sound within the project footprint anytime during the period of March 24 to September 15. This noise analysis at Stand 66, 64, and 63 used midday ambient noise and ambient noise may presumably be slightly lower near dusk and dawn. Accommodation of the potential daily variability will occur by restricting noise at the operations center/staging area set conservatively to not exceed “high” during the period from 1 hour before sunset to 1 hour after sunrise (see recommendations below).
RECOMMENDATIONS

Although murrelets have breeding activities (courtship, nest prospecting, incubation, chick rearing) that can range from late March to early September, their vulnerability to noise disturbance is greatest early in the nesting season. During incubation, the greatest risk of disturbance is during mate exchanges at the nest (near sunrise), and to a lesser extent to the incubating adult (Hebert and Golightly 2006).

Because of the “high” or “very high” ambient noise associated with Highway 101 during normal operational hours, no restrictions are recommended using the USFWS guidance for Stands 66, 63, and 64, with the exception of restriction of extreme noise within 400m of any of these stands. Extreme noise can be readily mitigated by implementing practices that reduce this type of noise (eliminate explosive or sudden noise such as blasting, require slow closure of back gates on gravel trucks, avoidance of pile driving type activities) during the murrelet breeding season.

Therefore, we recommend the following revisions to Mitigation Measure 3.5-1b given the findings of this supplemental habitat assessment.

Recommended Revisions to Mitigation Measure 3.5-1b: Avoid Indirect Impacts on Nesting Marbled Murrelet.

During the marbled murrelet nesting season (March 24–September 15), the project applicant shall maintain a no-disturbance buffer between the construction activity and marbled murrelet nesting habitat as described below. An exhibit showing the project improvements and marbled murrelet nesting habitat buffers shall be prepared demonstrating compliance with this mitigation measure. In the event the buffers cannot be maintained, an additional marbled murrelet shall be added to the compensatory mitigation required in Mitigation Measure 3.5-2c. The following auditory disturbance buffers shall be maintained between the construction activity and marbled murrelet nesting habitat:

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The “high” and “very high” buffers described in the table above are not applicable in situations where potential marbled murrelet nesting habitat is separated from construction activity by Highway 101 or where habitat is directly adjacent to highway 101. Instead, the project applicant shall maintain a no-disturbance buffer of 50 meters between construction activities that generate “very high” noise and these habitat stands during the period one hour after sunrise to one hour before sunset (because of the elevated preconstruction ambient noise at this site during operating hours, per USFWS Guidelines).

Between one hour before sunset to one hour after sunrise, the project applicant shall maintain this 50-meter no disturbance buffer between these stands and construction activities that generate “high” noise.
If implementation of the buffers described above is infeasible, the project applicant shall consult with CDFW and USFWS regarding an alternative buffer size. The project applicant shall provide documentation of concurrence from CDFW and USFWS to the Humboldt County Planning & Building Department for the alternative buffer size before issuance of construction permits.

REFERENCES


Potential MAMU Habitat in the Proposed Project Vicinity

- Proposed Project Disturbance Limits
- Potential Stands for Marbled Murrelets
- Potential Marginal Stand for Marbled Murrelets

Notes:
2. Base map: ESRI World Imagery web mapping service

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Proposed Project Disturbance Limits

Potential Stands for Marbled Murrelets

Potential Marginal Stand for Marbled Murrelets

100-meter Disturbance Buffer

400-meter Disturbance Buffer
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Potential MAMU Habitat in the Proposed Project Vicinity

- Proposed Project Disturbance Limits
- Potential Stands for Marbled Murrelets
- Potential Marginal Stand for Marbled Murrelets
- 100-meter Disturbance Buffer
- 400-meter Disturbance Buffer

Notes:
2. Base map: ESRI World Imagery web mapping service
3. Map extent: 792.0 x 612.0 at original document size of 8.5 x 11
Project Location: Humboldt County, California

Client/Project: Humboldt Wind, LLC

Figure No.: 1

Title: Potential MAMU Habitat in the Proposed Project Vicinity

Notes:
2. Base map: ESRI World Imagery web mapping service

Proposed Project Disturbance Limits
Potential Stands for Marbled Murrelets
Potential Marginal Stand for Marbled Murrelets

100-meter Disturbance Buffer
400-meter Disturbance Buffer
Humboldt County, California

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Potential MAMU Habitat in the Proposed Project Vicinity

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Page 6 of 19
Project Location: Humboldt County, California
Client/Project: Humboldt Wind Energy Project

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Proposed Project Disturbance Limits
Potential Stands for Marbled Murrelets
Potential Marginal Stand for Marbled Murrelets
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Potential MAMU Habitat in the Proposed Project Vicinity

Stantec
Humboldt Wind, LLC
Humboldt Wind Energy Project

Potential MAMU Habitat in the Proposed Project Vicinity

Proposed Project Disturbance Limits
Potential Stands for Marbled Murrelets
Potential Marginal Stand for Marbled Murrelets
100-meter Disturbance Buffer
400-meter Disturbance Buffer

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1 in = 1,333 ft
1:16,000
(All original electronic data at 6.5x5"

Page 8 of 19
Project Location
Humboldt Wind, LLC
Humboldt Wind Energy Project
Humboldt County, California

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Notes:
2. Base map: ESRI World Imagery web mapping service

Potential MAMU Habitat in the Proposed Project Vicinity

- Proposed Project Disturbance Limits
- Potential Stands for Marbled Murrelets
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- 100-meter Disturbance Buffer
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Potential Project Disturbance Limits

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- 400-meter Disturbance Buffer

ESRI World Imagery web mapping service

Potential Project Disturbance Limits

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- 400-meter Disturbance Buffer

ESRI World Imagery web mapping service
Proposed Project Disturbance Limits

Potential Stands for Marbled Murrelets

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100-meter Disturbance Buffer

400-meter Disturbance Buffer

Potential MAMU Habitat in the Proposed Project Vicinity

Humboldt County, California

Humboldt Wind, LLC

Humboldt Wind Energy Project

Figure 1

Notes:
2. Base map: ESRI World Imagery web mapping service

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**Project Location**
Eel River

**Client/Project**
Humboldt Wind, LLC
Humboldt Wind Energy Project

**Figure No.**
1

**Title**
Potential MAMU Habitat in the Proposed Project Vicinity

**Notes**
2. Basemap: ESRI World Imagery web mapping service
3. Distances are approximate and are not in proportion to actual distances.

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Potential MAMU Habitat in the Proposed Project Vicinity

- Proposed Project Disturbance Limits
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- 100-meter Disturbance Buffer
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Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Base map: ESRI World Imagery web mapping service

1 in = 1,333 ft
1:16,000
16,800 1 in = 1,333 ft
(All original document date of 8/5/03)
Proposed Project Disturbance Limits

Potential Marginal Stand for Marbled Murrelets
Potential Stands for Marbled Murrelets

100-meter Disturbance Buffer
400-meter Disturbance Buffer

Notes:
2. Base map: ESRI World Imagery web mapping service

Potential MAMU Habitat in the Proposed Project Vicinity

1 in = 1,333 ft
1:16,000

Proposed Project Vicinity

Figure No.
Title
Project Location
Client/Project

1
Humboldt Wind, LLC
Humboldt Wind Energy Project
Potential MAMU Habitat in the Proposed Project Vicinity

- Proposed Project Disturbance Limits
- Potential Stands for Marbled Murrelets
- Potential Marginal Stand for Marbled Murrelets
- 100-meter Disturbance Buffer
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Notes:
2. Base map: ESRI World Imagery web mapping service

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Potential MAMU Habitat in the Proposed Project Vicinity

Legend:
- Proposed Project Disturbance Limits
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- 400-meter Disturbance Buffer

Notes:
2. Base map: ESRI World Imagery web mapping service

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Humboldt County, California

Stantec Project
Humboldt Wind, LLC
Humboldt Wind Energy Project

Figure No. 1

Page 16 of 19
Potential MAMU Habitat in the Proposed Project Vicinity

- **Proposed Project Disturbance Limits**
- **Potential Stands for Marbled Murrelets**
- **Potential Marginal Stand for Marbled Murrelets**
- **100-meter Disturbance Buffer**
- **400-meter Disturbance Buffer**

Projected No.

Humboldt County, California

Humboldt Wind, LLC
Humboldt Wind Energy Project

Notes:

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Humboldt Wind Energy Project

Proposed Project Disturbance Limits
Potential Stands for Marbled Murrelets
Potential Marginal Stand for Marbled Murrelets
100-meter Disturbance Buffer
400-meter Disturbance Buffer

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Page 18 of 19
Potential MAMU Habitat in the Proposed Project Vicinity

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