
Marbled Murrelets in Humboldt County

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Abstract

About 14% of critical Marbled Murrelet habitat is within timber production land, 85% is public lands and 60% is within a half mile from a public roadway, and just under 1% of its original evergreen forest habitat has been lost from 2001 to 2011.

Introduction

Marbled Murrelets (*Brachyramphus marmoratus*) are a small seabird that lives specifically in old-growth Coastal Redwood, ranging from central California up the west coast through Canada and into Alaska. In the past couple of years the Marbled Murrelet population has been on the decline. Scientists believe that the population decline is due to the predation of Marbled Murrelet eggs by Corvids (crows, ravens, jays) and human impacts. Corvids are a widespread family of birds so relationships between them and Marbled Murrelets are hard to determine. Human impacts to the critical habitats are much easier to determine, such as public land use area, areas near public roadways and timber production land, and changes in land cover type. In this report we will study what may be affecting the Marbled Murrelet's decline in population in Northern California's Humboldt County.

Methods

This project is specific to Humboldt County so we will clip all of our data into the Humboldt County outline. This will also make our data sets significantly smaller making them much easier to work with. The National Land Cover raster is a large file and has too great of a resolution so we will resample the data into a lesser resolution before so it can be clipped into Humboldt County. We will use calculate geometry to find the total area of Marbled Murrelet Habitat.

On the parcel data set, using select by attributes, we will create a new layer that contains all timber production and timber/grazing parcels. By clipping the Marbled Murrelet critical habitat data with the newly created timber layer we will see, all habitat

areas affected by timber production. We will use calculate geometry to find the area of the habitat possibly impacted by timber production.

To see if human interaction overlaps with the critical habit we will clip the habitat layer with the public land layer. We will use calculate geometry to find the area of the habitat possibly impacted by human interaction on public land. To further address this issue, we will add in a Humboldt County Roadway shapefile, clip it into the public land layer and add a 0.5 mile buffer around all roads. Next, we will clip the buffered roads layer into the critical habitat layer. We will use calculate geometry to find the area of the habitat possibly impacted by human interaction on public land close to any roadways within critical habitat.

Finally, we will convert the habitat layer to a raster and use it to clip the National Land Cover change data. Then we will use select by attribute to create a layer showing all loss of evergreen forests. On that layer, we will add an area field and using calculate geometry, find how many acres of habitat have been lost.

Results

There are approximately 260,501 acres of Marbled Murrelet Critical Habitat in Humboldt County. Approximately 36,701 acres of that land is within timber production land, which is about 14% of the bird's nesting habitat (Fig. 2).

Approximately 221,291 acres of critical habitat is found in Public Land Use areas, that's almost 85% (Fig. 3).

There are approximately 156,229 acres of critical habitat within a half mile of public roadways. Just under 60% of the bird's habitat is near public accessible roads (Fig. 3).

The area of land within the Marbled Murrelet habitat that has been affected by loss of evergreen forests is only about 2,314 acres; only a small 0.88%. Almost 1% of critical habitat has been lost from 2001 to 2011 (Fig. 4).

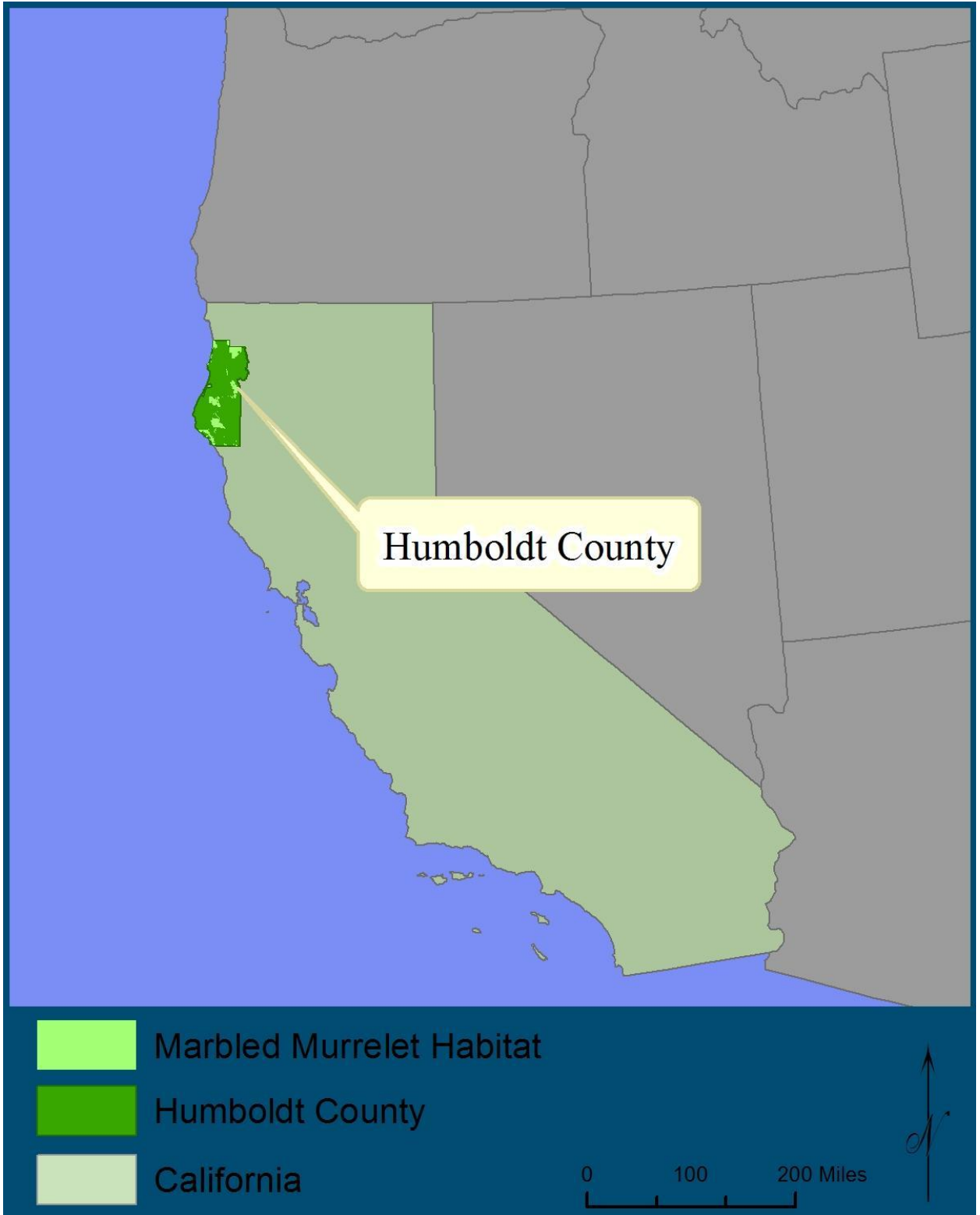


Figure 1: Locator Map of Marbled Murrelet Critical Habitat of Humboldt County, California.

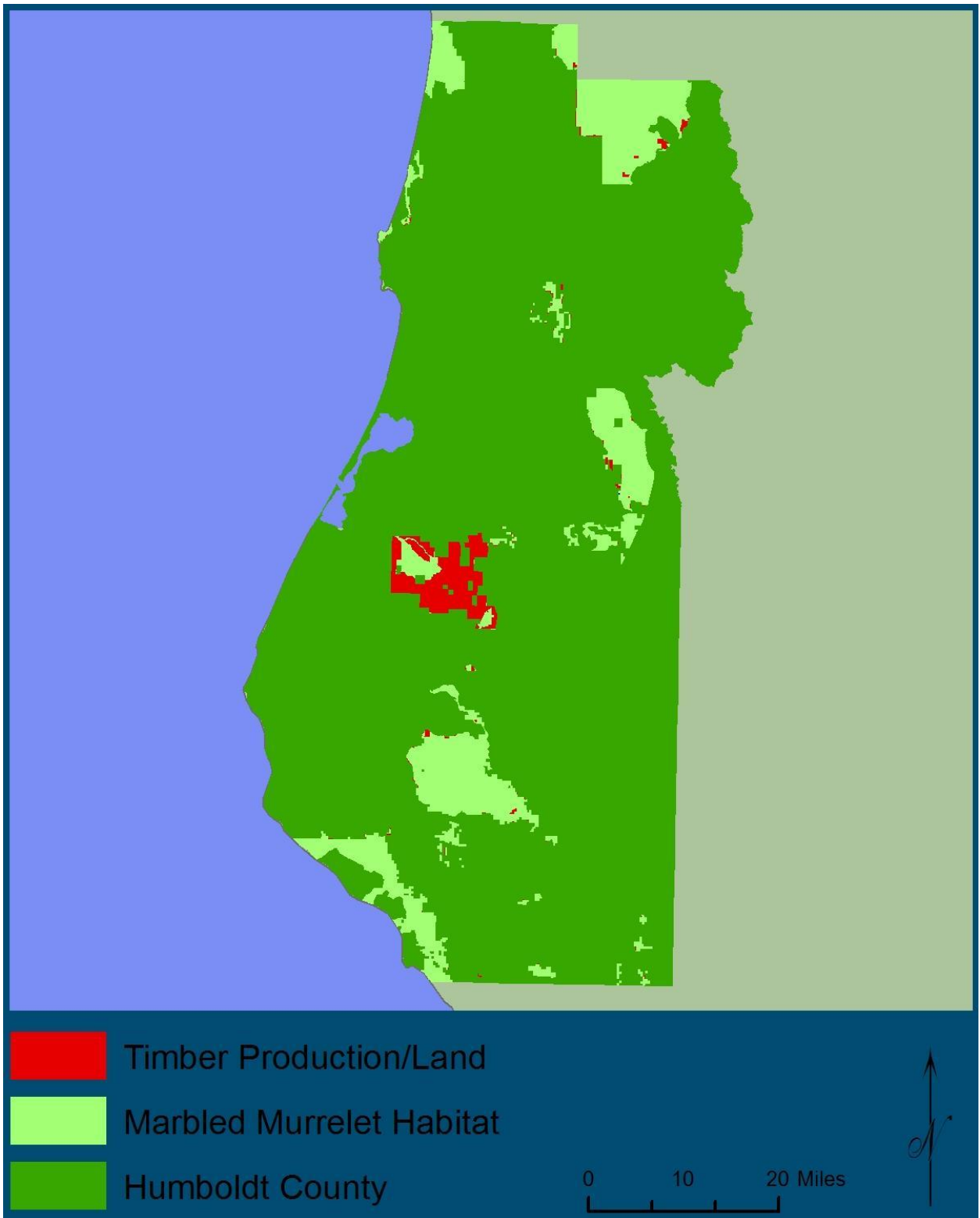


Figure 2: Marbled Murrelet Habitat affected by timber production in Humboldt County.

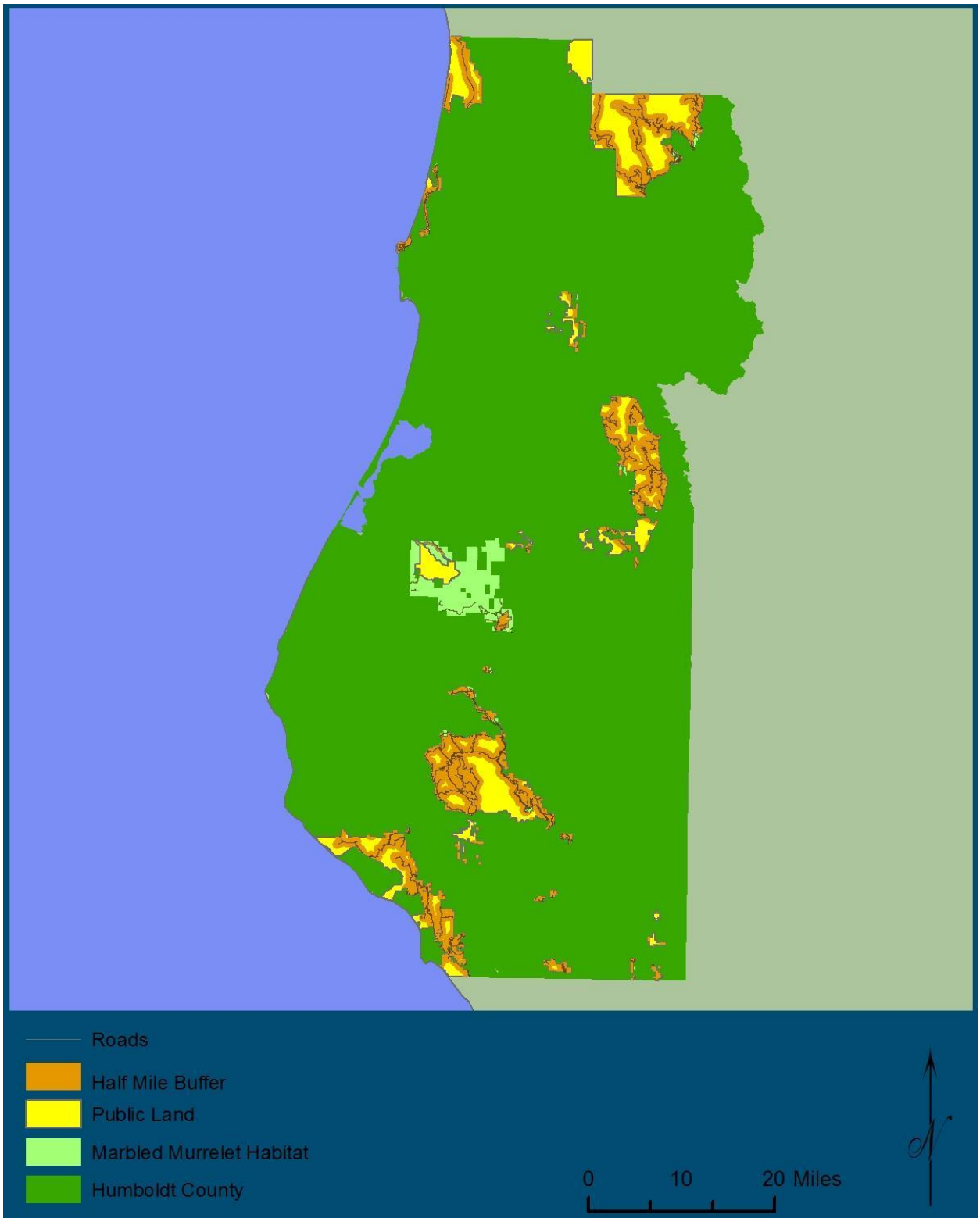


Figure 3: Marbled Murrelet Habitat affected by public land and within a half mile from public roadways in Humboldt County.

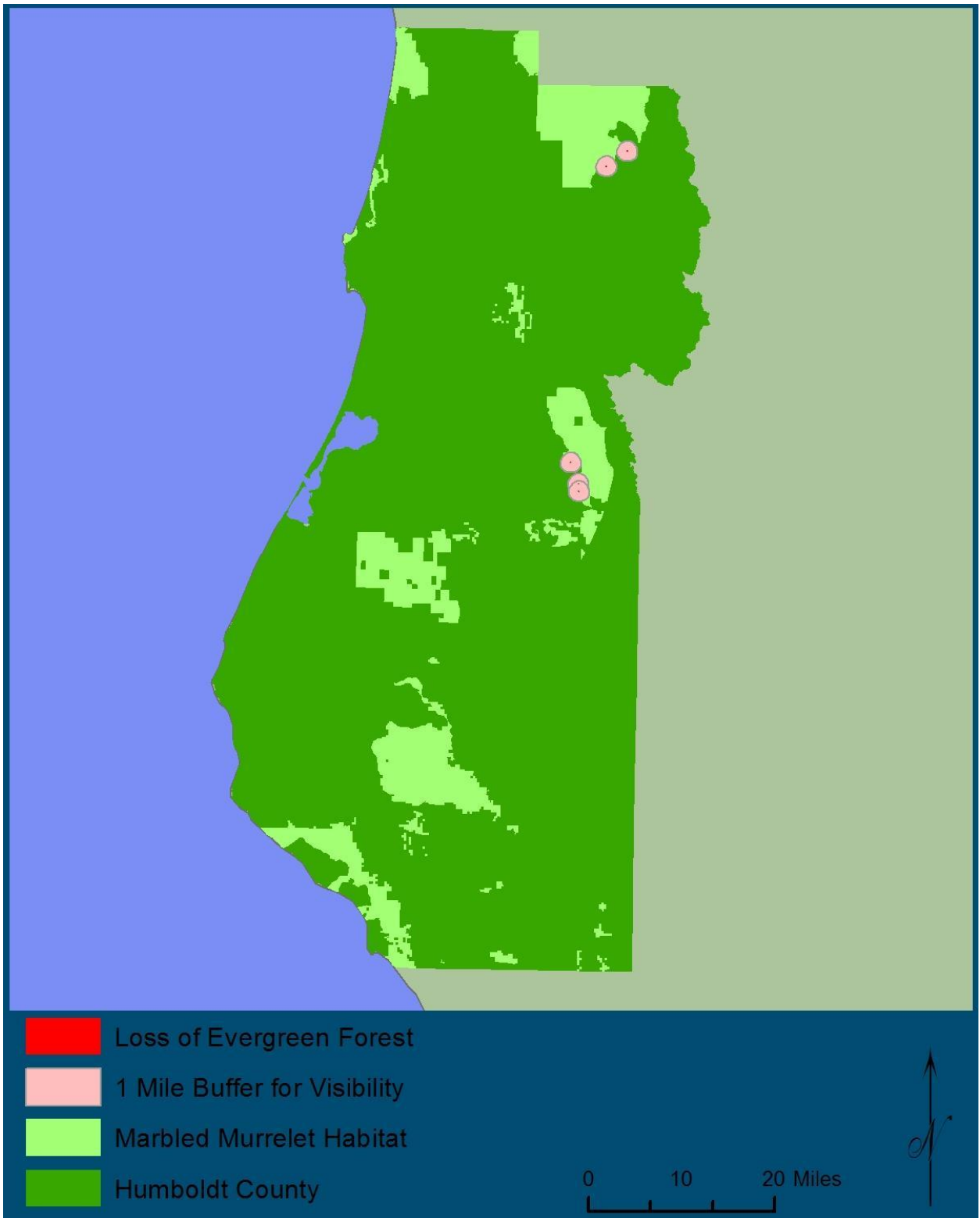


Figure 4: Loss of evergreen forest habitat in known Marbled Murrelet habitat in Humboldt County. (A buffer has been added to better show the locations)

Conclusion

After this study we can see that Marbled Murrelets are mostly being affected by humans, with 85% of their critical habitat being within public land boundaries. Timber production also has a decent effect on the Marbled Murrelets, with 14% of their land being within timber production land. We can also see that evergreen forest habitat loss is almost not affecting the Marbled Murrelets, with less than 1% of their habitat has been lost due to loss of evergreen forests in a span of 10 years.

Acknowledgements

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Matt Lau helped point us in another direction, after telling us that Corvids are too widespread to really study, when we were focusing too closely on them.

Jim Graham taught us all that we know about GIS and putting together professional reports.

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