



**Mystic Lake Hydroelectric Project
FERC Project Number 2301**

**3-Year Bald Eagle Monitoring Summary Report
2010-2013
Public**

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Executive Summary

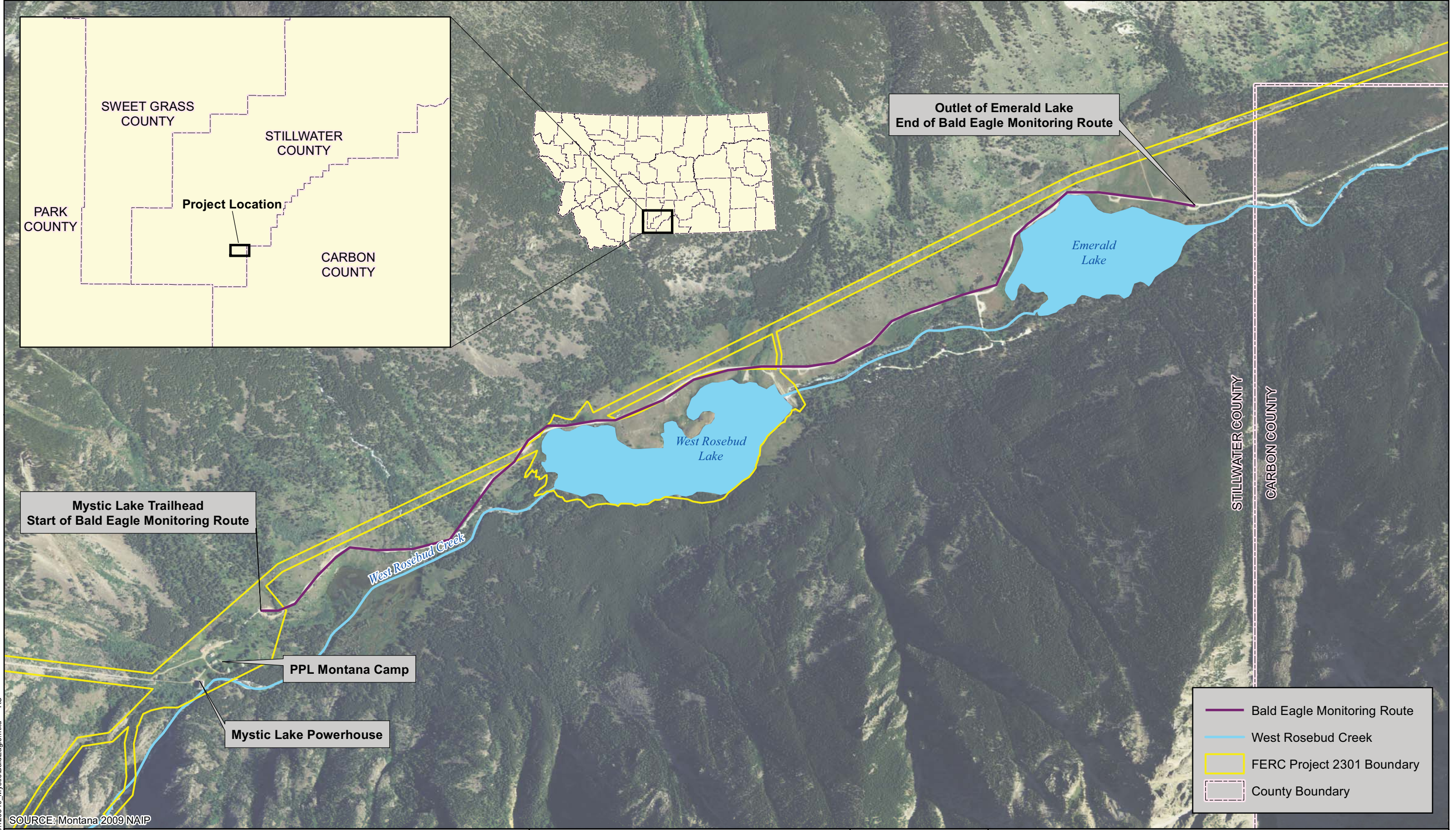
As required by the Federal Energy Regulatory Commission License Order for the Mystic Lake Hydroelectric Project (dated December 17, 2007), PPL Montana completed bald eagle (*Haliaeetus leucocephalus*) monitoring for the first three seasons (2010-2011, 2011-2012, 2012-2013) after the new license went into effect (January 1, 2010). Subsequent monitoring will be completed once every 5 years (next monitoring effort will be completed in 2017-2018) for the term of the new license or until bald eagles are removed from the U.S. Forest Service (USFS) Region 1 Sensitive Species list. The objective of this monitoring effort was to establish a baseline of bald eagle use of West Rosebud Creek and associated water bodies from the Mystic Lake Trailhead to the outlet of Emerald Lake (also referred to as the Project area) and determine the extent to which recreational use or human disturbance in the area may affect bald eagle perching, foraging, and roosting opportunities.

Analysis of the baseline data indicate that the presence of recreationists within the Project area do not negatively impact or affect bald eagle perching, foraging, and roosting opportunities. Bald eagles were observed concurrently with recreationists throughout the three monitoring seasons from 2010 to 2013. Bald eagles were not commonly observed in January or February. Bald eagles were observed in January only during one monitoring season (2011-2012), but never observed in February during the three monitoring seasons. Bald eagles were also observed with varying percentages of ice on West Rosebud and Emerald Lakes and at varying air temperatures/weather conditions. These data indicate that the presence of bald eagles within the Project area is likely influenced by seasonal movements of bald eagles or other unknown factors. The presence of recreationists appeared to have minimal, if any, effect on bald eagle presence in the Project area. The future monitoring efforts may provide additional information regarding the potential relationship between the presence of recreationists and potential impacts to bald eagles in the Project area.

1.0 Introduction

On December 15, 2006, PPL Montana submitted the Mystic Lake Hydroelectric Project's (Project) Final License Application (FLA) to the Federal Energy Regulatory Commission (FERC or Commission). The FERC approved the FLA and issued an Order for the new license on December 17, 2007. The previous license expired December 31, 2009 and the new 40-year license went into effect starting January 1, 2010.

Per the new License Order (dated December 17, 2007), PPL Montana is required to complete bald eagle (*Haliaeetus leucocephalus*) monitoring from October through February for each of the first 3 years (2010-2011, 2011-2012, 2012-2013) after the new license went into effect (January 1, 2010); then once every 5 years for the term of the new license or until bald eagles are removed from the U.S. Forest Service (USFS) Region 1 Sensitive Species list. The objective of this monitoring effort is to establish a baseline of bald eagle use of West Rosebud Creek and associated water bodies from the Project area, extending from the Mystic Lake Trailhead to the outlet of Emerald Lake (Figure 1-1). The baseline data will assist in determining the extent to which recreational use or human disturbance in the Project area may affect bald eagle perching, foraging, and roosting opportunities. This report summarizes the data for the three seasons of bald eagle monitoring (2010-11, 2011-12, and 2012-13). Monitoring will continue on a 5-year interval with the next monitoring season commencing in October 2017.



**Mystic Lake Trailhead
Start of Bald Eagle Monitoring Route**

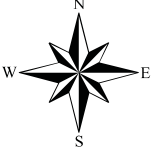
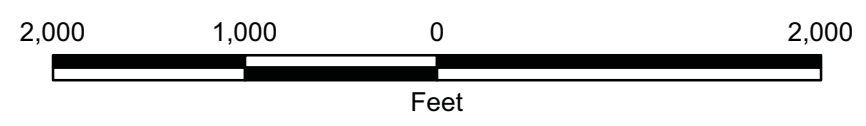
**Outlet of Emerald Lake
End of Bald Eagle Monitoring Route**

PPL Montana Camp

Mystic Lake Powerhouse

- Bald Eagle Monitoring Route
- West Rosebud Creek
- FERC Project 2301 Boundary
- County Boundary

SOURCE: Montana 2009 NAIP



Mystic Lake Hydroelectric Project
FERC No. 2301
Stillwater and Carbon Counties, Montana

PPL Montana, LLC



MYSTIC LAKE BALD EAGLE MONITORING

MARCH 2013

FIGURE 1-1

21-Mar-2013 Z:\Projects\120540_MysticBaldEagle.mxd RS

2.0 Methods

The bald eagle monitoring methodology outlined in the FLA is as follows:

- Drive road, looking for eagles along creek, lakes, and lake shores. Stop periodically and search through binoculars
- Route: Mystic Lake trailhead parking area to outlet of Emerald Lake
- Monitor weekly, weather permitting, or at a minimum every other week from October 1 to February 28
- Conduct monitoring for each of the first 3 years after license issuance, then once every 5 years for the term of the new Project license or until bald eagles are removed from the USFS Region 1 Sensitive Species list
- Record data on Midwinter Bald Eagle Survey Standardized Form adapted for the Project. Include observed recreation activity, if any, along creek and at lakes during time of survey. This survey method is consistent with the Nationwide Midwinter Bald Eagle Survey. The USFS recognizes that some portions of West Rosebud Creek will not be visible from the road.
- If warranted, adapt future monitoring method and timing to better monitor disturbance effects of recreation on bald eagles
- Report date and location of incidental sightings outside survey period to the Beartooth Ranger District wildlife biologist
- Progress of the measure will be filed with the Commission within 1 year of the completion of the first 3-year survey, followed by subsequent reports within 1 year of the completion of each additional survey conducted on 5-year interval for the term of the license. The Mystic Wildlife and Terrestrial Technical Advisory Committee will meet regularly to discuss progress of the protection, mitigation, and enhancement measures.

PPL Montana staff (survey observers) completed the 2010-2011, 2011-2012, and 2012-2013 bald eagle monitoring seasons (October 1 through February 28) in accordance with the methodologies outlined in the FLA and listed above. The monitoring route started at the Mystic Lake Trailhead (Trailhead) and extended downstream along West Rosebud Creek, past West Rosebud Lake to the outlet of Emerald Lake (*see* Figure 1-1). Monitoring efforts included identifying bald eagles, as well as golden eagles (*Aquila chrysaetos*). Survey observers were trained on how to identify and differentiate bald and golden eagles, including immature *versus* adult eagles, and to implement the annual monitoring efforts. Data sheets, adapted for the Project from the Midwinter Bald Eagle Survey Standardized Form, were provided to the survey observers by the USFS.

During each monitoring season, survey observers drove the monitoring route and looked for bald eagles and golden eagles near the creek, lakes, and lake shores. They stopped

periodically and searched through binoculars. The number of adults and/or immature bald eagles and/or golden eagles was recorded on the data sheets. The number of recreationists present along the creek and at the lakes during the time of survey was also recorded. The distance from the recreationist to the eagle was recorded, if practicable. Weather conditions, including air temperature and percent ice cover on West Rosebud and Emerald lakes, were also recorded. This survey method is consistent with the USFS National Midwinter Bald Eagle Survey method.

3.0 Results

The results of the 3 seasons of bald eagle surveys are summarized in Table 3-1. There were 19 surveys completed in 2010-2011 and 22 surveys for each subsequent season for a total of 63 surveys. A total of 40 bald eagles and two golden eagles were through the entire period of monitoring. The mean number of bald eagles observed per survey day ranged from 0.4 in 2010-2011 to 0.8 in 2011-2012. Only two golden eagles (one mature, one immature) were observed during the survey period (both observations occurred in October 2010), no immature bald eagles were observed during the survey.

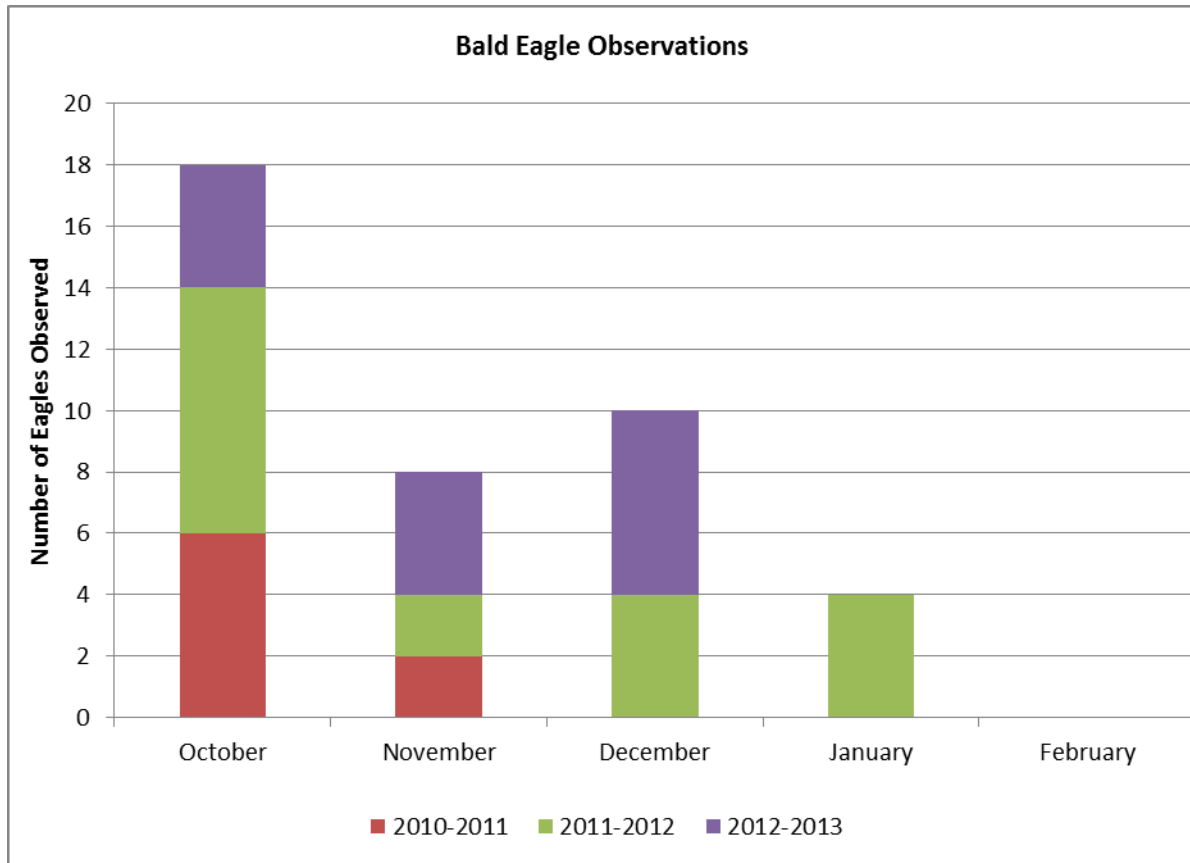
Table 3-1: Summary of bald eagle survey results at Mystic Lake Hydropower Project.

Year	Number of Surveys with Eagles/Total Number of Surveys	Total Number of Bald Eagles Observed	Total Number of Golden Eagles Observed	Last Date Eagles Observed During Survey Period
2010-2011	5/19	8	2	November 13, 2010
2011-2012	12/22	18	0	January 22, 2012
2012-2013	9/22	14	0	December 22, 2012
Total	26/63	40	2	-

3.1 Seasonal Observations

Bald eagles were most commonly observed in October (Figure 3-1). Bald eagles were rarely observed in January (only in the 2011-2012 monitoring season), and never observed in February. One mature golden eagle was observed on October 23, 2010 and one immature golden eagle was observed on October 30, 2010. These dates were the only surveys where golden eagles were observed during the 3 seasons of monitoring.

Figure 3-1: Number of bald eagles observed by month during the 2010-2011, 2011-2012, and 2012-2013 monitoring efforts.



Air temperature and estimated percent ice cover (based on visual observations) on West Rosebud and Emerald lakes are presented for the 2012-2013 (Figure 3-2), 2011-2012 (Figure 3-3), and 2010-2011 (Figure 3-4) monitoring seasons. The average air temperature for the 2012-2013 survey dates was approximately 32 degrees Fahrenheit (°F). The average air temperature recorded during the 2011-2012 survey dates was approximately 33 °F compared to an average of 26 °F for the 2010-2011 survey dates.

Figure 3-2: Air temperature (°F) and percent ice cover (visual estimate) on West Rosebud Lake and Emerald Lake during the 2012-2013 monitoring effort.

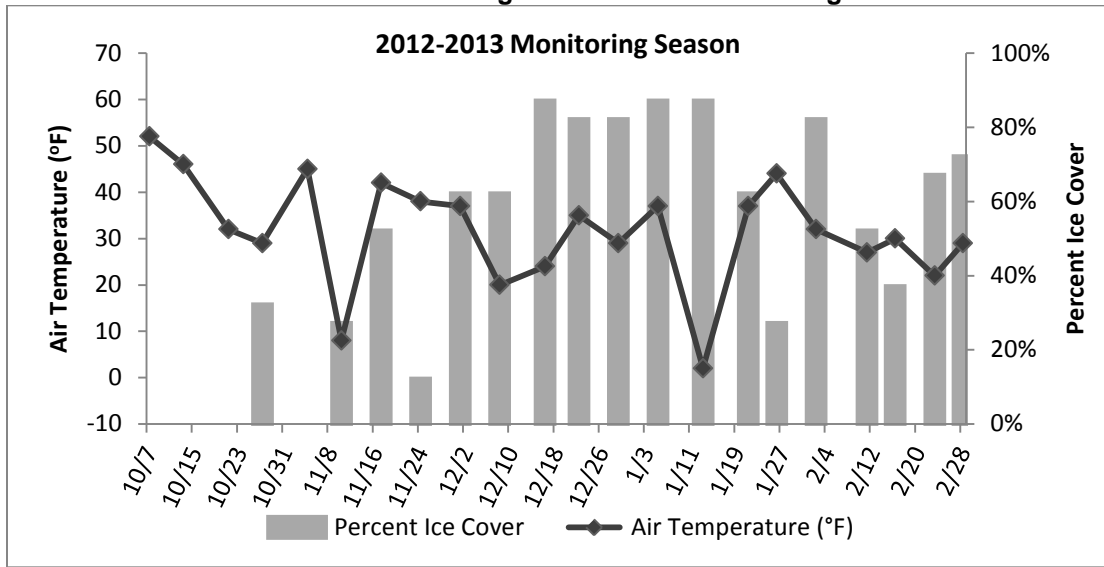


Figure 3-3: Air temperature (°F) and percent ice cover (visual estimate) on West Rosebud Lake and Emerald Lake during the 2011-2012 monitoring effort.

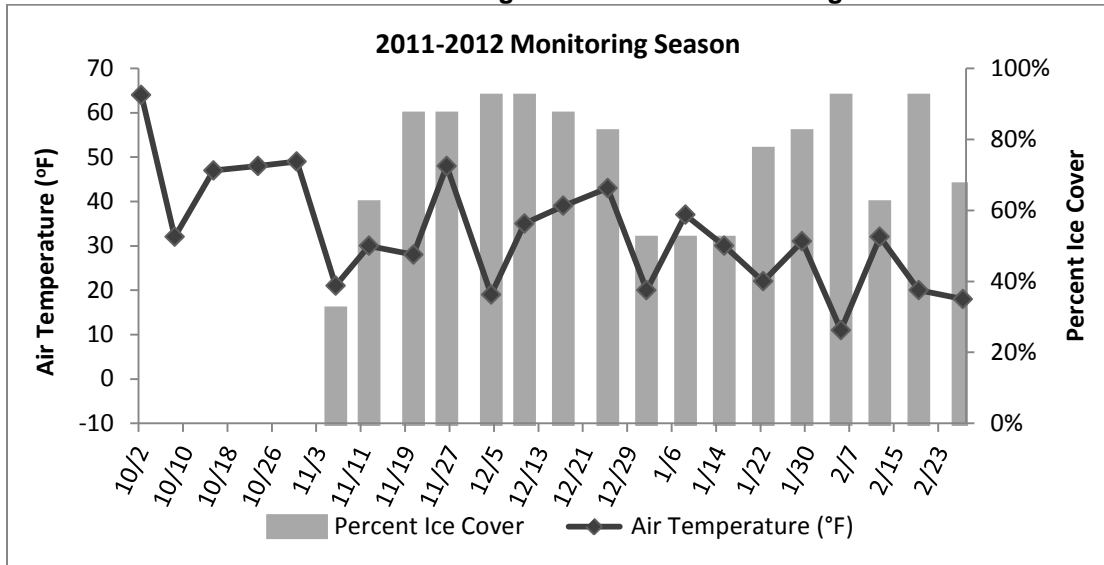
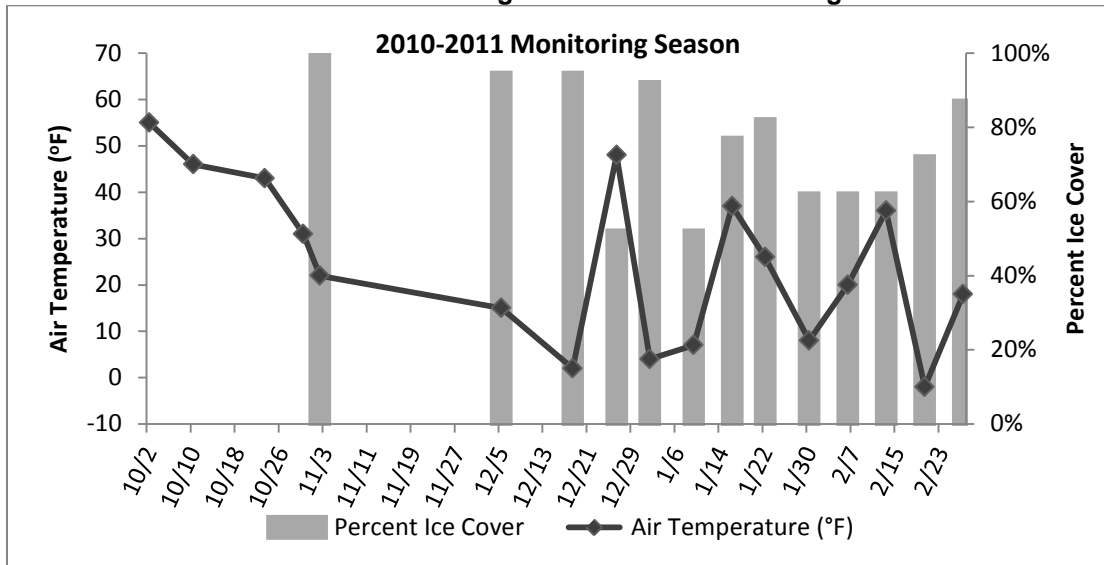
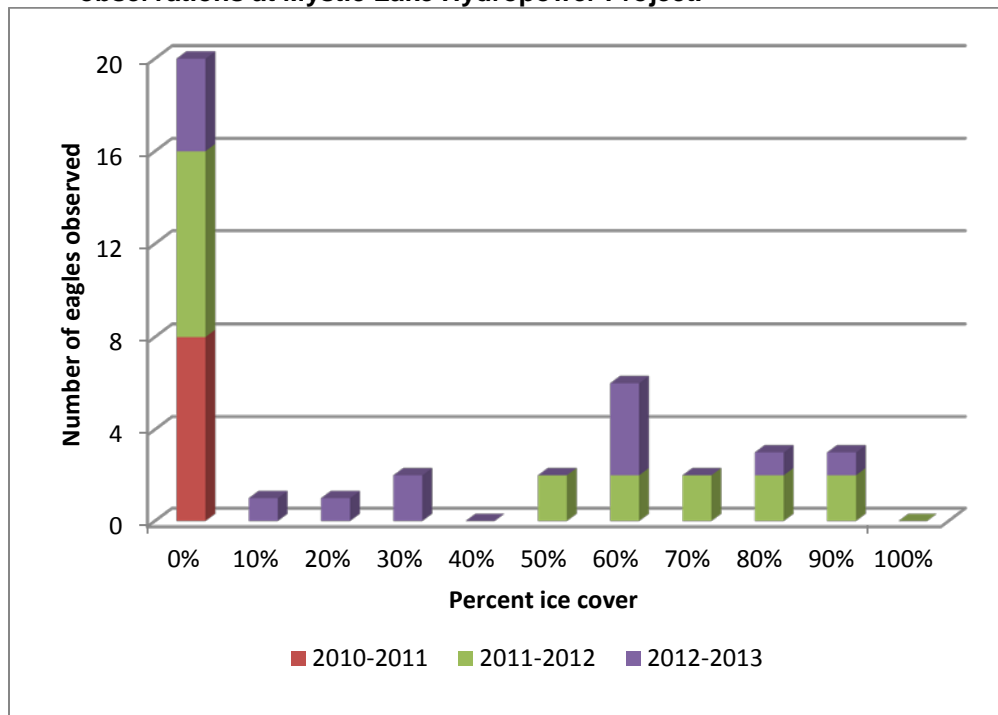


Figure 3-4: Air temperature (°F) and percent ice cover (visual estimate) on West Rosebud Lake and Emerald Lake during the 2010-2011 monitoring effort.



Of the 40 eagles observed during the 3 years of study, half of them (20 eagles) were observed when there was no ice cover on the study area (Figure 3-5). However, a few eagles were observed when ice cover was as high as 90 percent (Figure 3-5).

Figure 3-5: Percent of ice cover and number of eagles observed during the 3 years of observations at Mystic Lake Hydropower Project.



3.2 Impact of Recreationists

During the 2010-2011 monitoring season, recreationists were observed with all five eagle observations in October and November. Five of the 12 observations of eagles during the 2011-2012 seasons occurred concurrently with observations of recreationists in the area. Six of the nine observations of eagles during the 2012-2013 season occurred concurrently with observations of recreationists in the area. Table 3-2 provides the number of surveys where eagles were observed and corresponding observation of the recreationists for the three study seasons. Eagles were observed during 26 of the 63 surveys completed between 2010 and 2013. During the 26 surveys where eagles were identified (Table 3-2), more eagles were observed when recreationists were present (15 surveys) than when recreationists were not present (11 surveys). This may be a reflection of temperature and ice coverage, where fewer recreationists were in the area, and coincidentally fewer eagles, during these less desirable weather conditions during the winter months.

Table 3-2: Summary of the number of surveys where eagles and recreationists were observed.

	Eagles - Yes	Eagles - No
Recreationists - Yes	15	17
Recreationists - No	11	20

Eagles (bald and golden) were always observed near either West Rosebud Lake or Emerald Lake, or near the Riverine Wetland Area, which is a broad, shallow braided area of West Rosebud Creek downstream of the powerhouse and upstream of West Rosebud Lake (Figure 1-1). The locations where recreationists were most commonly identified for all three monitoring seasons included Emerald Lake Campground, Emerald Lake, West Rosebud Lake, and the Mystic Lake Trailhead. The minimum proximity of recreationists and bald eagles was also documented when possible during the surveys. During the three monitoring seasons (2010-2011, 2011-2012, 2012-2013), there were five, seven, and 12 surveys, respectively, where eagles and recreationists were observed concurrently. On average eagles and recreationists were within approximately 0.6 mile of one another with the minimum distance of 0.1 mile and the maximum distance of 1.5 miles. The summary of the location of bald eagles and recreationists, as well as golden eagles and recreationists is provided in Tables 3-3 and 3-4, respectively.

Table 3-3: Locations of bald eagles and recreationists by date. (NA – not applicable, NO – none observed)

Date	Number of Bald Eagles	Bald Eagle Locations	Recreationist Locations	Estimated Minimum Distance to Bald Eagle
10/2/2010	1	West Rosebud Lake	Emerald Lake Campground and Mystic Lake Trailhead	0.7 mile
10/10/2010	1	Riverine Wetland Area - East	Emerald Lake Campground and Mystic Lake Trailhead	0.1 mile
	1	Riverine Wetland Area - West		
10/23/2010	1	Inlet of Emerald Lake	Emerald Lake Campground	0.5 mile
10/30/2010	1	Inlet of Emerald Lake	Mystic Lake Trailhead	1.0 mile
	1	Inlet of West Rosebud Lake		0.5 mile
11/6/2010	2	West Rosebud Lake	Mystic Lake Trailhead	0.7 mile
10/2/2011	1	West Rosebud Lake – East Shore	Emerald Lake Campground, West Rosebud Lake, Mystic Lake Trailhead	0.3 mile
10/8/2011	1	West Rosebud Lake – West End	Emerald Lake Campground, Mystic Lake Trailhead	0.7 mile
10/15/2011	1	Emerald Lake – East Side	West Rosebud Lake, Mystic Lake Trailhead	1 mile
10/23/2011	1	Inlet of Riverine Wetland Area	NO	NA
	2	Inlet of West Rosebud Lake		
10/30/2011	2	Inlet of West Rosebud Lake	Emerald Lake Campground, West Rosebud Lake, Mystic Lake Trailhead	0.1 mile
11/12/2011	2	Inlet of Emerald Lake	NO	NA
12/4/2011	1	Inlet of Emerald Lake	NO	NA
12/10/2011	1	Inlet of Emerald Lake	Emerald Lake Campground	0.2 mile
12/25/2011	1	Inlet of Riverine Wetland Area	NO	NA
	1	Inlet of Emerald Lake	NO	NA
1/1/2012	1	Inlet of West Rosebud Lake	NO	NA
1/15/2012	1	Outlet of Riverine Wetland Area	NO	NA
1/22/2012	1	Inlet of West Rosebud Lake	NO	NA
	1	Outlet of Emerald Lake		
10/13/2012	2	Inlet of West Rosebud Lake	NO	NA

Date	Number of Bald Eagles	Bald Eagle Locations	Recreationist Locations	Estimated Minimum Distance to Bald Eagle
10/27/2012	2	Inlet of West Rosebud Lake	Mystic Lake Trailhead	1 mile
11/4/2012	2	Inlet of Emerald Lake	NO	NA
11/10/2012	1	Inlet of West Rosebud Lake	Outlet of Emerald Lake	1.5 miles
11/24/2012	1	Inlet of West Rosebud Lake	NO	NA
12/1/2012	1	Inlet of Emerald Lake	Inlet of Emerald Lake	0.1 mile
	1	Inlet of West Rosebud Lake	Inlet of Emerald Lake	0.5 mile
12/8/2012	2	Inlet of Emerald Lake	Mystic Lake Trail	1.5 miles
12/16/2012	1	Middle of Riverine Wetland Area	Mystic Lake Trailhead	0.5 mile
12/22/2012	1	Inlet of West Rosebud Lake	NO	NA

Table 3-4: Locations of golden eagles and recreationists by date. (x – information not recorded during survey)

Date	Number of Golden Eagles	Golden Eagle Locations	Recreationist Locations	Estimated Minimum Distance to Golden Eagle
10/23/2010	1	Middle of the Riverine Wetland Area	Emerald Lake Campground	0.5 mile
10/30/2010	1	x	Outlet of Emerald Lake; Mystic Lake Trailhead	x

Recreationist observations were identified as fishermen or other recreations (i.e. hikers, campers, and hunters). The data collected for the three seasons was collectively analyzed to evaluate whether the type of recreationists (fishermen or other) affected the presence of eagles. The summary of the results are provided in Table 3-5. During the 15 surveys where eagles and recreationists were both observed: one survey observed fisherman only, five surveys identified fishermen and other recreationists, and nine surveys identified other recreationists only. During the 17 surveys where no eagles were observed but recreationists were present: three surveys identified fishermen only, five surveys identified fishermen and other recreationists, and nine surveys identified recreationists only. There were a total of 11 surveys completed where eagles were observed and no recreationists were present. In addition, there were 20 surveys completed where neither eagles nor recreationists was observed. The analysis did not result in any significant correlation between the type of

recreationist and presence of eagles during the monitoring period. Analysis of the recreationist data did not indicate that the type of recreationist observed during the surveys [fishermen vs. other recreationists (i.e., hikers, campers, and hunters)] had an effect on the presence of eagles in the area.

Table 3-5: Summary of the number of surveys for four categories (eagles and recreationists present; no eagles, recreationists present; eagles present and no recreationists; and no eagles or recreationists) based on the type of recreationists present for all three monitoring seasons.

	Fisherman	Fishermen and Other Recreationists	Other Recreationists	Total Surveys
Eagles Present, Recreationists Present	1	5	9	15
No Eagles, Recreationists Present	3	5	9	17
Eagles Present, No Recreationists	-	-	-	11
No Eagles, No Recreationists	-	-	-	20

4.0 Discussion

The annual eagle monitoring efforts from 2010 through 2013 supported the establishment of baseline data regarding bald eagle use along West Rosebud Creek, from the Mystic Lake Trailhead downstream past West Rosebud Lake to the outlet of Emerald Lake. The baseline data collection and subsequent analysis were intended to assist in determining the extent to which recreational use in the Project area may affect bald eagle perching, foraging, and roosting opportunities. Below is a summary of the main observations from the 2010-11, 2011-2012, and 2012-13 monitoring seasons:

- The 2010-2011 monitoring season was on average cooler (26 °F) than the two subsequent seasons (32 °F and 33 °F). There were also fewer total eagles observations (8 bald and 2 golden eagles) and fewer observations of recreationists present (observed present during 5 surveys) during the 2010-2011 season compared to the subsequent seasons (18 bald eagles and nine surveys with recreationists in 2011-12; 14 bald eagles and 12 surveys with recreationists in 2012-13).
- Analysis of the baseline data indicate that the presence of recreationists within the Project area do not appear to have any negative impact or affect on bald eagle perching, foraging, and roosting opportunities as bald eagles were observed concurrently with recreationists throughout the first 3 monitoring seasons.
- There were more survey days where bald eagles were observed concurrently with recreationists in the area than without recreationists. Eagle (bald and golden) were observed to be present within a minimum of 0.1 mile of recreationists during the surveys. Bald eagles were observed near West Rosebud and Emerald lakes, areas which are also popular with recreationists.
- During the first three monitoring seasons, bald eagles were not observed in February and there were only observations of bald eagles in January in one of the seasons (2011-2012 monitoring season). Although half the observations of bald eagles occurred when there was no ice cover, bald eagles were also observed with ice cover as high as 90 percent. This indicates that the presence of bald eagles within the Project area is likely influenced by seasonal movements of bald eagles or other unknown factors and not by the presence of recreationists.
- Golden eagles are rare in the Project area in the winter months, with only two sightings of golden eagles in the 3 years of survey.

Future monitoring efforts will occur every 5 years with the next survey being completed during the winter of 2017-2018. The future monitoring efforts may provide additional information regarding the potential relationship between the presence of recreationists and potential impacts to bald eagles in the Project area.