

**Lewis River Hydroelectric Projects Settlement Agreement
Terrestrial Coordination Committee (TCC)
Meeting Agenda**

Date & Time: Wednesday, June 11, 2014
9:00 a.m. – 3:30 p.m.

Place: Merwin Hydro Control Center
105 Merwin Village Court
Ariel, WA 98603

Contacts: Kirk Naylor: (503) 813-6619; cell (503) 866-8750

Time	Discussion Item
9:00 a.m.	Welcome <ul style="list-style-type: none"> ➤ Review Agenda & 5/14/14 Meeting Notes ➤ Comment & accept Agenda & 5/14/14 Meeting Notes
9:15 a.m.	Devils Backbone Forestry Pole Buyer & Inmate Crews - Discussion
9:45 a.m.	Farmland Report Review
10:15 a.m.	Osprey Data Review
10:30 a.m.	Land Acquisition Update
10:45 a.m.	Safety ¹ discussion and prepare for field trip
11:00 a.m.	<ul style="list-style-type: none"> ➤ Next Meeting's Agenda ➤ Public Comment Opportunity Note: all meeting notes and the meeting schedule can be located at: http://www.pacificorp.com/es/hydro/hl/lr.html#
11:10 a.m.	Field Tour: Units 20 (last year's forest management and/or Unit 38 (property acquired in 2012). Tour agenda depends on time and TCC requests.
3:30 p.m.	Return to HCC and Adjourn

¹ Please bring rain gear and sturdy walking shoes for hiking in the forest – PacificCorp will have 2 vehicles for transportation of up to 6 additional passengers

Join by Phone
+1 (503) 813-5252 [Portland, Ore.]
+1 (855) 499-5252 [Toll Free]

Conference ID: 25166794

Please bring your lunch

FINAL Meeting Notes
Lewis River License Implementation
Terrestrial Coordination Committee (TCC) Meeting
June 11, 2014
Merwin Hydro Control Center
Ariel, WA

TCC Participants Present: (9)

Ray Crosswell, RMEF
Peggy Miller, WDFW
Eric Holman, WDFW
Kimberly McCune, PacifiCorp Energy (conference call only)
Kirk Naylor, PacifiCorp Energy
Kendel Emmerson, PacifiCorp Energy
Erik White, Cowlitz Indian Tribe
Nathan Reynolds, Cowlitz Indian Tribe
Diana Gritten-MacDonald, Cowlitz PUD

Calendar:

July 9, 2014	TCC Meeting	Conference Call
August 13, 2014	TCC Meeting	HCC

Assignments from June 11, 2014	Status
McCune: Email the Northern Goshawk Home Range Habitat Characteristics document to the TCC.	Complete – 6/11/14

Assignments from May 14, 2014	Status
Miller: Email her Cowlitz PUD Devil’s Backbone Timber calculations to the TCC for their review and consideration.	Complete – 6/5/14
McCune: Add discussion on Cowlitz PUD Devil’s Backbone Timber Management to the June meeting agenda.	Complete – 5/29/14
Emmerson: Add goshawk features to the spreadsheet that are a priority in a specific region.	Complete – 5/19/14

Assignments from March 12, 2014	Status
Emmerson: Provide TCC additional data on the number of Osprey nests destroyed and unrepaired as reported in the 2013 WHMP Annual Report.	In Progress

Assignments from June 13, 2012	Status
Naylor: Review the SA/WHMP budget(s) as well as determine status and opportunity for coordination with John Cook (NCASI) and Lisa Shipley (Washington State University) doing the black-tail study and report back to the TCC.	In Progress

Review of Agenda and Finalize Meeting Notes

Kirk Naylor (PacifiCorp Energy) called the meeting to order at 9:05 a.m. Naylor reviewed the agenda and asked the TCC if there were any changes/additions. Peggy Miller (WDFW) would like to add comment/discussion regarding the webinar discussion, on “Ungulates and Climate Change: an Examination of the Potential Impacts (<https://nccwsc.usgs.gov/webinar/248>). Naylor reviewed the May 14, 2014 meeting notes and assignments. The meeting notes were approved at 9:15 am without change.

Devil's Backbone Forestry Pole Buyer & Inmate Crews - Discussion

In relation to the Cowlitz PUD Devil's Backbone Timber Management Request for Quotation Peggy Miller (WDFW) reviewed a document titled, Devil's Backbone Timber Management Summary Calculations, dated June 5, 2014 ([Attachment A](#)).

Discussion took place regarding effectiveness of inmate crews with this type of work, annual use of inmate crews, size of trees they can cut and preference to use professionals for falling trees.

Miller reviewed the memo to include but not limited to requirements for action, assumptions and logging alternatives. She requested the TCC review the following three (3) alternatives:

- *Alternative 1: 1 acre*
- *Alternative 2: 1 acre cleared and 9 acres variable-density thin (focused on the smaller diameter classes)*
- *Alternative 3: 10 acres cleared and 40 acres variable-density thin (focused on the smaller diameter classes)*

However, see Attachment A for further detail.

Diana Gritten-MacDonald (Cowlitz PUD) expressed to the TCC that they should consider the cost of long term maintenance liability (post logging costs) such as grass seeding, fertilizing, replanting, burning piles, and invasive species management.

The TCC agreed to the following next steps:

1. Delete from the 2014 WHMP Annual Plan: 4 bluebird boxes, PMWMU-REV shrub planting, and fall tree/shrub planting for weed control.
2. Work with Meridian and the Pole Buyer to prepare a Request for Qualifications to create one 5-acre patch cut (including stand entry and road work) on the Devil's Backbone. The costs of obtaining the permits (Meridian), dealing with the slash, and converting the patch cut to a permanent meadow will be calculated separately.

Farmland Report Review

Kendel Emmerson (PacifiCorp) reviewed the Lewis River Farm, Idle Fields and meadows Initial Inspections Report, June 10, 2014 ([Attachment B](#)) to include wildlife habitat potential, forage quality, invasive plant species and management priority as listed by area name and included a summary of each. This was mostly to correct the acreage, other than two meadows in Unit 26 were corrected to shrubland.

Osprey Data Review

Emmerson reviewed a document titled Raptor Nest Summary Data, June 2014 (**Attachment C**) to determine if there is a correlation between a decline in osprey occupancy and increase in eagle occupancy. Emmerson also compared average annual and breeding season temperature data and annual precipitation to determine a correlation, if any, with osprey decline. There is only a slight correlation to April and May precipitation and eagle occupancy. It would take a more robust statistical analysis to conclude anything more specific. Interesting to note is that the osprey occupancy in 2013 is the same as 1996. See **Attachment C** for detailed data.

In addition, a new eagle nest was identified upstream of Merwin Dam. The Bonneville Power Administration was notified due to surveys they are conducting along their proposed route but it is greater than 0.25 miles from their proposed project.

Land Acquisition Update

This discussion is considered confidential and proprietary and not for public viewing.

The TCC agreed to spend up to the existing \$1.3M from the Lewis River Swift 1 and 2 Fund for securing interest in certain land & timber acquisitions.

Public Comment Opportunity

No public comment was provided.

Note: Due to time restrictions no additional discussion took place about the <https://nccwsc.usgs.gov/webinar/248> webinar.

<11:50 a.m. meeting adjourned>

Conducted safety orientation and departed for the field tour at 12:00pm.

Depart for tour of Unit 38 and plan to return to HCC by 3:30 p.m. Time does not allow to visit Unit 20 but it will be rescheduled on another date as approved by the TCC.

TCC Field Tour of Management Unit 38

The TCC was taken to Management Unit 38 that was part of the 2012 acquisition. PacifiCorp explained the clearing along the road that was necessary to gain access and the grading, water-bars and grass seeding that was completed in 2013 to reduce erosion in the road. Cross drain culverts will be added in 2014 to further improve drainage along the road.

The TCC was then shown the approximately 4.7 acre area that had the tree regeneration removed to release the existing shrubs to provide permanent forage. Disturbed or bare soil areas were grass seeded. The TCC was shown the natural shrubs that were released as a result of the clearing which included Vaccinium spp., Salix spp., Rubus spp., and Arctostaphylos spp. Naylor intends to do a more thorough review of the shrub species present in 2014 and also access invasive weed treatments that may be necessary. A similar treatment was done to the east on an additional 4 acres in THA 053802.

Agenda items for July 9, 2014

- Review June 11, 2014 Meeting Notes
- Devils Backbone Timber Management – Discussion
- Land Acquisition – Update

Next Scheduled Meetings

July 9, 2014	August 13, 2014
TCC Meeting	TCC Meeting
Conference Call	Merwin Hydro Control Center
Ariel, WA	Ariel, WA
9:00am – 12:00pm	9:00am – 3:00pm

Attachments:

- June 11, 2014 Meeting Agenda
- [Attachment A](#) - Devil's Backbone Timber Management Summary Calculations, dated June 5, 2014
- [Attachment B](#) - Lewis River Farm, Idle Fields and meadows Initial Inspections Report, June 10, 2014
- [Attachment C](#) - Raptor Nest Summary Data, June 2014



Figure 1. TCC looks at area cleared in 2013 to release native shrub species.

Devil's Backbone Timber Management Summary Calculations

Utilizing:

- Cowlitz PUD Devil's Backbone Timber Management Request for Non-binding Quote EXHIBIT A Devil's Backbone Timber Management SCOPE OF WORK
- Email subject line Devil's Backbone Timber Management Next Steps sent by Diana MacDonald on Wednesday, April 09, 2014 2:32:45 PM

Email

Requirements for action to be profitable for Utility pole buyer

- For 40 - 45 foot poles, the trees (Douglas fir only) have to be 11 inches dbh or greater.
- There are about 24 poles per trailer.
- The buyer needs 20 – 30 trailers to be profitable.
- Of the 30 trailers, 20 are poles and 10 are smaller trees destined for the mill.

Assumptions

- Trees 11 dbh and greater are at least 40 to 45 foot tall

To be profitable

- 20 trailers x 24 poles per trailer = 480 trees 11 inch dbh or greater, 40 to 45 foot tall
- 10 trailers less than 11 inch dbh

SCOPE OF WORK

2.0 Logging Alternatives

Alternative 1: Create two 0.25-acre patch cuts and one 0.5-acre patch cut, leaving all logs on site.

Alternative 2: Create two 0.25-acre and one 0.5-acre patch cut and conduct a variable-density thin (focused on the smaller diameter classes) between the patches so that the treated area occupies a total of 10 acres. Leave a target amount of 25 tons per acre of coarse woody debris in the largest diameter class on site.

Alternative 3: Create five 1-acre and ten 0.5-acre patch cuts and conduct a variable-density thin (focused on the smaller diameter classes) on 50 acres. Leave a target amount of 25 tons per acre of coarse woody debris in the largest diameter class on site.

Summary: Acres cleared and/or thinned

- Alternative 1: 1 acre
- Alternative 2: 1 acre cleared and 9 acres variable-density thin (focused on the smaller diameter classes)
- Alternative 3: 10 acres cleared and 40 acres variable-density thin (focused on the smaller diameter classes)

For Discussion Purposes Only

June 5, 2014

3.1 Patch cut lay-out (Determining percentage of live Douglas fir 11 inch dbh or greater for the three patch cuts)

Data provided in SOW

Patch 1: 0.5-acres

Diameter Class (Inches dbh)	Douglas-fir		Hemlock		Total All Trees
	Dead	Live	Dead	Live	
4	3	1	1	1	6
5	4		1	2	7
6	7	2		3	12
7	2	7	1	1	11
8	2	9		5	16
9		14		2	16
10		12		1	13
11	1	20		2	23
12	1	18		7	26
13		13		6	19
14	1	14		2	17
15		7		4	11
16		3		3	6
17		3		4	7
18		2		1	3
19				1	1
20				1	1
Total Live and Dead trees within Patch 1					195

Patch 2: 0.25-acres

Diameter Class (Inches dbh)	Douglas-fir		Hemlock		Total All Trees
	Dead	Live	Dead	Live	
3	2				2
4	11			1	12
5	1	2		1	4
6	7	4		1	12
7	1	3			4
8		4		4	8
9		8		5	13
10		3		2	5
11		7		4	11
12		3		5	8
13		4		8	12
14		2		1	3
15		1		2	3
16				2	2
Total Live and Dead Trees within Patch 2					99

For Discussion Purposes Only
June 5, 2014

Patch 3: 0.25-acres

Diameter Class (Inches dbh)	Douglas-fir		Hemlock		Total All Trees
	Dead	Live	Dead	Live	
3			1	1	2
4	2		1		3
5	1			1	2
6		1		4	5
7		3		7	10
8		2		4	6
9		4		5	9
10		1		6	7
11				7	7
12		4		3	7
13		1		4	5
14		1		5	6
15		1		1	2
16		1			1
17		2		2	4
Total Live and Dead Trees within Patch 3					76

Patch 1, 2, and 3 = 1 acre total

Summation SOW data for three patches and trees 11 inches dbh or greater

Diameter Class (Inches dbh)	Douglas-fir		Hemlock		Total All Trees	% live Douglas fir by dbh
	Dead	Live	Dead	Live		
11	1	27	0	13	41	66%
12	1	25	0	15	41	61%
13	0	18	0	18	36	50%
14	1	17	0	8	26	65%
15	0	9	0	7	16	56%
16	0	4	0	5	9	44%
17	0	5	0	6	11	45%
18	0	2	0	1	3	67%
19	0	0	0	1	1	0%
20	0	0	0	1	1	0%
totals	3	107	0	75	185	
% of Total	2%	58%	0%	41%		

Assumption

- 58% of the stand at Devil's Backbone will be live Douglas fir 11 inch dbh or greater

3.2 Stand Summary

The table below, based on four random plots sampled in June 2013, summarizes the Devil's Backbone stand. While the very rough estimates do not include any statistical error values, they do provide relative ballpark estimates of the magnitude of the volume, the range of sizes, the distribution among diameter classes.

Summary Stand Table (SOW data)

DBH Class	Per Acre Values			Cumulative Percent of Stand		
	No. Trees	BA	BF Vol	No. Trees	BA	BF Vol.
10	13.8	7.5	1,086	6.8%	3.8%	3.5%
11	56.8	37.5	5,455	35.1%	23.1%	21.0%
12	28.6	22.5	3,581	49.3%	34.6%	32.6%
13	40.7	37.5	6,184	69.5%	53.8%	52.5%
14	7.0	7.5	1,116	73.0%	57.7%	56.1%
15	12.2	15.0	2,359	79.1%	65.4%	63.6%
16	21.5	30.0	4,791	89.8%	80.8%	79.1%
17	9.5	15.0	2,550	94.5%	88.5%	87.3%
18	0.0	0.0	0	94.5%	88.5%	87.3%
19	7.6	15.0	2,628	98.3%	96.2%	95.7%
20	3.4	7.5	1,327	100.0%	100.0%	100.0%
Stand Average	201.2	195.0	31,079	per acre values		

Average Dominant / Co-dominant Stand Height = 95 ft.

Summation of the potential number of live Douglas fir per acre by dbh

DBH Class	Per Acre Values		
	No. Trees	% live Douglas fir (patch)	No. Live Douglas Fir
11	56.8	66%	37.4
12	28.6	61%	17.4
13	40.7	50%	20.4
14	7.0	65%	4.6
15	12.2	56%	6.9
16	21.5	44%	9.6
17	9.5	45%	4.3
18	0.0	67%	0.0
19	7.6	0%	0.0
20	3.4	0%	0.0
Total	187		100
Alternate Calculation	187	58%	108

Average Dominant / Co-dominant Stand Height = 95 ft.

Number of live Douglas fir per acre: approximately 100 trees 11 inch dbh or greater.

Summary: Approximate number of trees to be cut for each alternative

- Alternative 1:
 - 1 acre cleared
 - 107 trees* 11 inch dbh or greater harvested
 - Will not be profitable for utility pole buyer. Does not meet 480 trees 11 inch dbh or greater or 10 trailers of smaller trees

- Alternative 2:
 - 1 acre cleared and 9 acres variable-density thin (focused on the smaller diameter classes)
 - 107 trees* 11 inch dbh or greater harvested
 - Will not be profitable for utility pole buyer. Does not meet 480 trees 11 inch dbh or greater, variable thinning and smaller trees harvested in patch cuts may reach 10 trailers of smaller trees

- Alternative 3:
 - 10 acres cleared and 40 acres variable-density thin (focused on the smaller diameter classes)
 - approximately 1000 trees 11 inch dbh or greater harvested in patch cuts
 - Could be profitable for utility pole buyer. Meets the 480 trees 11 inch dbh or greater; variable thinning and smaller trees harvested in patch cuts will provide 10 trailers of smaller trees.
 - Determine if 25 tons per acre of coarse woody debris in the largest diameter class could be met.

*Numbers based on patch cut data. All trees within the patch cut were marked and measured, so the number and size of trees are available.



Figure 2. TCC discussion of shrubs and invasive plants in area cleared to provide permanent early seral habitat.

FARM, IDLE FIELDS, AND MEADOWS INITIAL INSPECTIONS REPORT

LEWIS RIVER WILDLIFE HABITAT MANAGEMENT PLAN LANDS

2014



June 10, 2014

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APPENDICES

Appendix A: Summary of Initial Inspection Results

1.0 Introduction

The Lewis River Wildlife Habitat Management Plan (WHMP) lands have 3 types of open grassland habitats: farmland, meadow, and idle area (PacifiCorp 2008). These areas are primarily managed to provide optimum foraging habitat for elk (*Cervus elaphus*) and nesting habitat for Savannah sparrows (*Passerculus sandwichensis*) with emphasis on black-tailed deer (*Odocoileus hemionus*) habitat. These areas were originally vegetation cover typed as either (PacifiCorp or Cowlitz PUD 2004):

Agriculture (AG) site characterized as by human disturbance, development, or modification and is annually seeded or planted with row crops and harvested for commercial use.

Dry Meadow/Grassland (MD) which is classified as upland vegetation cover type with the ground cover consisting less than 10% of forested canopy and greater than 50% grass species.

These definitions were used to identify the farm and meadow areas that would be evaluated during the initial inspection. These included every farmland, meadow, and idle are identified in the WHMP Table 8.3.1 (PacifiCorp 2008), as well as any known meadows or farmlands that been acquired with land acquisitions since 2008. Appendix A is a summary of the inspection results and identifies each area that was inspected.

2.0 Methods

For those areas that qualify as meadow, farmland, or idle area, the initial inspection determined the quality of habitat for associated species (i.e., elk, Savannah sparrow, and black - tailed deer), whether the area should be actively or passively managed, as well as any specific management needs that should occur. The inspections were conducted in 2010 during the growing season (between April 15 and September 30). The inspections were recorded on the Initial Inspection Form that recorded the following:

- Confirm that the area meets either the dry meadow/grassland or agricultural criteria.
- Evaluate the potential big game and savannah sparrow use, as well as other wildlife observations.
- Estimate the grass, forb, and shrub composition by ocular assessment.
- Estimate the size of the area.
- Describe current access to the area and access restrictions or limitations; determine if further management is required.
- Evaluate potential disturbance and line-of-sight to the disturbance.
- Assess invasive plant species presence.

The vegetation cover type (VCT) mapping conducted during relicensing was completed using aerial photo interpretation in several areas; therefore some areas did not meet either the AG or

MD VCT criteria and were re-typed appropriately. Other areas met the VCT criteria but location needed to be correct. These revisions are explained in detail in the following sections and are summarized in the table in Appendix A and maps in Appendix B.

This report is a summary of these inspections identifying which areas are proposed to be managed as farmland, idle field, or meadow habitat under the Lewis River WHMP. The report, also, identifies and prioritizes which farmland, idle fields, and meadows may be actively managed (i.e., intensive and annual management) and which areas may be passively managed (i.e., managed as needed and where feasible), as well as proposed management practices for each area.

3.0 Results

The following is a summary of the field findings and recommended management for each farmland, idle fields, and meadows:

Unit 3 McKee Meadows

Survey Dates: April 23, 2010

Observer: Kendel Emmerson

Size:

Name	Pre-Initial Inspection Vegetation Cover Type (acres)	Post-Initial Inspection Vegetation Cover Type (acres)
	MD	MD
Upper McKee	1.18	1.18
Lower McKee	1.04	1.04
Total	2.22	2.22

Both of the McKee Meadows vegetation cover types were corrected to the actual locations.

Forage quality: This area exceeds the 50% grass criteria and meets the VCT definition of meadow. Overall these meadows provide high quality forage.

Invasive Plant Species: Trace amounts of bull thistle (*Cirsium vulgare* [Class C]), Himalayan blackberry (*Rubus armeniacus* [Class C]), and common catsear (*Hypochaeris radicata* [Class C]) were observed in Upper McKee Meadow. Trace amounts of dovefoot geranium (*Geranium molle*), bull thistle (Class C), and curly dock (*Rumex crispus*) were observed in Lower McKee Meadow. Both meadows have had prior treatments for stinging nettle (*Urtica dioica*) and Canada thistle (*Cirsium arvense* [Class C Cowlitz County High Priority]).

Visual Screen: Both meadows have visual screens that are thin to lacking due to the shoreline. The north, east, and west visual barriers are deciduous forest and topographic relief. The south is the shoreline with a few shrubs and red alders (*Alnus rubra*), but the steep shoreline provides some screening from boats in the immediate area.

Wildlife: Wildlife observed during the inspection included signs of elk foraging and pellets in the Upper McKee meadow. A red-breasted nuthatch (*Sitta canadensis*), yellow-rumped warblers (*Dendroica coronata*), song sparrows (*Melospiza melodia*), and American robins (*Turdus migratorius*) were observed. These meadows are too small to provide suitable habitat for Savannah sparrows.

Conclusion: Maintain gates at the road to avoid disturbance. Both McKee meadows have been historically managed as an active meadow (i.e., that is mowed and fertilized annually) and should continue to be. The meadow needs to be revised in Appendix A map to meet the 1.0 acre criteria for vegetation cover typing (PacifiCorp 2008). Elk use has declined in the recent years in both the McKee meadows, but not for the management unit. Therefore if the area was to be reduced to an every other year fertilization schedule, then elk forage could be maintained. Note the sign in Upper McKee Meadow designates this area as “Day Use”, however due to the sheer bank there is rarely any boat-in recreation activity.



Figure 1: Upper McKee Meadow



Figure 2: Lower McKee Meadow

Unit 6 Speelyai Meadow

Survey Date: May 26, 2010

Observer: Kendel Emmerson

Size:

Name	Pre-Initial Inspection Vegetation Cover Type (acres)		Post-Initial Inspection Vegetation Cover Type (acres)	
	MD	MS	MD	OR
Speelyai Meadow	0.4	0.2	0.60	1.27
Total	0.60		1.87	

Speelyai is unique in that the adjacent orchard is included in the meadow management. Even though the meadow is less than 1.0 acre in size the total meadow management area is almost 1.87 acres.

Forage Quality: Both the meadow and orchard area exceed the 50% grass criteria and provide excellent forage year round.

Invasive Plant Species: Trace amounts of Canada thistle (Class C Cowlitz County High Priority) were observed.

Visual Screen: The visual screen is a forested edge that provides excellent screening along all sides.

Wildlife: No wildlife was observed during the inspection due to heavy rains. Elk and deer use are frequently observed in this meadow during past inspections. The meadow is too small to provide suitable habitat for Savannah sparrows.

Conclusion: This area does qualify as meadow and has historically been managed as an active meadow (i.e., that is mowed and fertilized annually). This should continue and any options to expand the meadow or to reduce conifer encroachment should be considered for future management. The following photos show the forage quality in both the upper west portion of the meadow and the orchard area in 2009.



Figure 3: Speelyai Meadow orchard area



Figure 4: Upper (west) portion of Speelyai Meadow

Unit 8 Leach Field Meadow

Survey Date: September 1, 2010

Observer: Kendel Emmerson

Size:

Name	Pre-Initial Inspection Vegetation Cover Type (Acres)	Post-Initial Inspection Vegetation Cover Type (Acres)
		MD
Leach Field Meadow	2.49	2.49

Leach Field Meadow is the drain field for Cresap Campground septic.

Forage Quality: Forage quality is poor but has recently been greatly improved with invasive plant species control. Figures 5 and 6 compare the meadows prior to treatment in 2010 and following treatment in 2014.

Invasive Plant Species: The meadow had moderate amounts of bracken fern (*Pteridium aquilinum*), scotch broom (*Cytisus scoparius* [Class C Cowlitz County High Priority Weed]), and lesser amounts of Canada thistle (Class C Cowlitz County High Priority Weed) and reed canarygrass (*Pteridium aquilinum* [Class C]).

Visual Screen: The visual screen is a forested edge and is adequate along all sides, except the property line to the north. The adjacent land owners have cleared their land, so the screen along the northern boundary is sparse. This area should be planted with conifer trees and shrubs to provide a visual screen.

Wildlife: A moderate amount of elk use occurs in this area. Other wildlife observations noted during the inspection included bear (*Ursus americanus*) scat, American robin, cedar waxwing (*Bombycilla cedrorum*), and Stellar's jay (*Cyanocitta stelleri*). The meadow is too small and

isolated to provide suitable habitat for Savannah sparrows. Elk use has significantly increased in response to the invasive plant species control.

Conclusion: Because this area is the drain field it advised that management actions avoid using any equipment heavier than an all-terrain vehicle (ATV). Therefore this meadow should be considered passively managed meadow. Future management should include continuing to control invasive plant species, surveying to determine the property line, and then planting an adequate screen along the property line.



Figure 5: Leach Meadow in 2010



Figure 6: Leach Meadow in 2014.

Unit 10 Saddle Dam Field 1 -5 and Idle Areas

Survey Dates: May 6 and 7, 2010

Observer: Kendel Emmerson

Size:

Name	Post-Initial Inspection Vegetation Cover Type (acres)							Post-Initial Inspection Vegetation Cover Type (acres)		
	AG	DV	MD	OR	SH	UD	Total	AG	MD	Total
Saddle Dam Field 1	2.53	0.00	0.00	0.04	0.00	0.00	2.57	2.57	0.00	2.57
Saddle Dam Field 2	7.86	0.57	0.00	0.03	0.00	0.00	8.46	8.46	0.00	8.46
Saddle Dam Field 3	7.99	0.01	0.10	0.42	0.78	0.00	9.30	9.30	0.00	9.30
Saddle Dam Field 4	5.36	0.00	0.00	0.00	0.00	0.00	5.36	5.36	0.00	5.36
Saddle Dam Field 5	3.71	0.00	0.03	0.00	0.07	0.00	3.81	3.81	0.00	3.81
Idle Field 1/5	0.00	0.00	1.40	0.00	0.00	0.01	1.41	0.00	1.41	1.41
Idle Field 3 /4	0.20	0.00	0.00	0.00	5.50	0.19	5.89	0.00	5.89	5.89
Idle Field 1/2	0.18	0.00	0.00	0.00	1.00	0.00	1.18	0.00	1.19	1.19
Total	27.83	0.58	1.53	0.49	7.35	0.20	37.99	29.50	8.49	37.99

Forage Quality: Forage quality is excellent in the Saddle Dam fields and is fair to good in the idle fields.

Invasive Plant Species: The area has relatively low invasive plant species because the saddle dam farm fields are routinely mowed. However, both Canada thistle (Class C Cowlitz County High Priority Weed) and bull thistle (Class C) are monitored and treated every few years. The idle fields are not mowed regularly and have persistent scotch broom (Class C Cowlitz County High Priority Weed) that has been treated several times.

Visual Screen: The Saddle Dam farm fields have a forested edge or planted hedgerows to break the line of sight. The idle areas visual screens are mostly vegetation, trees and shrubs, with some gaps and opening. These gaps and opening provide passage for big game and should be maintained. The Saddle Dam Orchard #3 had additional 20 trees planted to break the line of sight from the road into Field 2.

Wildlife: The entire area has high and year-round elk use. The farm fields are used for bedding and foraging, whereas the idle fields are used mostly for hiding cover and bedding. Other wildlife observations noted during the inspection included coyote (*Canis latrans*) scat, western tanager (*Piranga ludoviciana*), common yellow-throat (*Geothlypis trichas*), northern flicker (*Colaptes auratus*), Canada geese (*Branta canadensis*), red-breasted nuthatch, Townsend moles (*Scapanus townsendii*), violet-green swallows (*Tachycineta thalassina*), American robin, black-throated gray warbler (*Dendroica nigrescens*), Pacific treefrog (*Pseudacris regilla*), European starling (*Sturnus vulgaris*), yellow-rumped warblers, warbling vireo (*Vireo gilvus*), pacific slope flycatcher (*Empidonax difficilis*), black-headed grosbeak (*Pheucticus melanocephalus*), and

spotted towhee (*Pipilo maculatus*). Savannah sparrows are typically observed in the farm fields in the spring.

Conclusion: Idle Field 1/2 was originally vegetation cover type as a 1.00 acre shrubland (SH). The Shrubland Initial Inspection Report re-vegetation type this area as 1.6 acres of meadow (MD) and 0.6 acres of Upland Deciduous, this area should include into the Meadow, Farmland, and Idle Area passive management areas. Idle Area 3/ 4 should have the Douglas-firs (*Pseudotsuga menziesii*) less than 7 in. dbh removed to reduce conifer encroachment and should be mowed and/or fertilized every 3 years to reduce the snowberry (*Symphoricarpos albus*) and increase the palatable grasses.



Figure 7: Idle Area 1/2 facing east



Figure 8: Idle Field 1/5 facing north



Figure 9: Idle Field 3/4 facing east



Figure 10: Saddle Dam Field 1



Figure 11: Saddle Dam Field 2



Figure 12: Saddle Dam Field 3



Figure 13: Saddle Dam Field 4



Figure 14: Saddle Dam Fields 5

Unit 12 Bridge and Hanley-Curry Meadows

Survey Date: May 26, 2010

Observer: Kendel Emmerson

Size:

Name	Pre-Initial Inspection Vegetation Cover Type (acres)						Post-Initial Inspection Vegetation Cover Type (acres)
	AG	MD	SH	UD	UM	Total	MD
Upper Hanley-Curry	0.0	7.65	2.30	0.00	0.00	9.99	9.99
Lower Hanley-Curry	0.0	4.52	1.60	0.00	0.29	6.41	6.41
Bridge	1.29	0.0	0.0	0.40	0.00	1.29	1.29
Total	1.29	12.18	3.9	0.40	0.29	17.69	17.69

Upper Hanley-Curry has an area that was originally identified as Meadow-Shrubland has been incorporated into the meadow. Lower Hanley-Curry's the shrubland (SH) acres were re-typed as MD. Bridge meadow was originally typed as AG, this was corrected and the entire polygon changed to MD.

Forage quality: Forage quality is excellent in both of the Hanley-Curry meadows. Bridge meadow forage is good, but is limited by shallow rocky soils and shading due to surrounding timber and shape of the meadow.

Invasive Plant Species: Upper Hanley-Curry invasive plant species tend to be mostly thistles, however, meadow knapweed (*Centaurea jacea x nigra* [Class B designate for control in Clark County]) was detected and treated in the area. Most of the Himalayan blackberry (*Rubus armeniacus* [Class C]) and evergreen blackberry (*Rubus laciniatus* [Class C]) is maintained by mowing. Bridge meadow has had western bracken fern (*Pteridium aquilinum*) control treatments in the past that have been very effective.

Visual Screen: Each meadow is screened with forested edges and access is successfully controlled by gated roads. Both areas have regular foot traffic for fishing access at Bridge and Hanley-Curry meadows are used for hunting and adjacent neighbors walking. The Hanley-Curry area tends to have some ATV trespass, but this appears to occur mainly on the roads and at a low frequency. Upper Hanley-Curry would benefit to have a visual break in the center of the western portion of the meadow.

Wildlife: Because these meadows are on the south side of Merwin Reservoir, the elk use is comparatively less. Therefore the management goal for these meadows is largely to promote black-tailed deer forage and Savannah sparrow habitat. Although savannah sparrows have never been sighted in the Hanley-Curry meadows, both of these meadows provide good quality nesting habitat. Other wildlife observations noted during the inspection included common yellow-throat, hairy woodpecker (*Picoides villosus*), ruffed grouse (*Bonasa umbellus*), and Douglas squirrel (*Tamiasciurus douglasii*).

Conclusion:

There is a flat-low bench between the Lower Hanley-Curry orchard and the reservoir that is solid Himalayan blackberry. This area should be explored as potential meadow expansion area in the future.



Figure 15: Bridge Meadow



Figure 16: Lower Hanley-Curry



Figure 17: Upper Hanley-Curry in August 2006

Unit 15 Buncombe Hollow Meadow

Survey Date: September 1, 2010

Observer: Kendel Emmerson

Size:

Name	Pre-Initial Inspection Vegetation Cover Type (acres)				Post-Initial Inspection Vegetation Cover Type and following 2013 Expansion (acres)
	MS	P	SH	Total	MD
Buncombe Hollow	0.34	0.58	0.94	2.2	1.87

The Buncombe Hollow meadow was originally vegetation cover typed as a Shrubland (SH) during the relicensing studies; which was inaccurate in both cover type and location. It was primarily an open grassy area that was less than 1.0 acre in size surrounding by pole conifer and red alder. This area was included in the inspection because the existing grassy area was expanded and restored to a meadow as part of the 2012 timber harvest.



Figure 18: Buncombe Hollow Meadow in 2010



Figure 19: Buncombe Hollow Meadow in 2014

Forage quality: This meadow was expanded and restored in 2013. The grass seeding was successful with more than 95% ground cover with quality forage.

Invasive Plant Species: Because this is a newly restored meadow, there are very few invasive plant species. The plants that are a concern are curly doc (*Rumex crispus*), bracken fern and snowberry.

Visual Screen: The meadow is screened with forested edges and access is successfully blocked by gated roads. The area appears to be accessed on foot only, which increases seasonally during the hunting season.

Wildlife: Because this meadow is on the south side of Merwin Reservoir, the elk use is relatively low; therefore the management goal for this meadow is largely to promote black-tailed deer forage and bird habitat. Other wildlife observations noted during the inspection included Steller's jay (*Cyanocitta stelleri*), black bear, and black-tailed deer.

Conclusion:

The area should be mowed and fertilized at least every other year to avoid encroachment. Some shrubs may be left within the meadow to provide cover and forage for deer.

Unit 17 Winter Creek and Hamm Meadows

Survey Dates: April 22 to May 10, 2010

Observer: Kendel Emmerson

Size:

Name	Pre-Initial Inspection Vegetation Cover Type (acres)									Post-Initial Inspection Vegetation Cover Type (acres)
	AG	M	MD	MS	P	RES	ROW	UD	Total	MD
Upper Winter Creek	0.00	0.01	3.21	0.00	0.00	0.00	0.00	0.13	3.35	3.35
Lower Winter Creek	0.00	0.00	0.25	0.67	0.22	0.00	0.00	2.89	4.04	4.04
Hamm Meadow 1	0.12	0.00	0.67	0.00	0.00	0.60	0.00	0.00	1.39	1.39
Hamm Meadow 2	3.95	0.00	0.99	0.00	0.00	0.10	0.00	0.00	5.04	5.04
Hamm Meadow 3	4.64	0.00	2.55	0.00	0.00	0.00	0.01	0.00	7.21	7.21
Hamm Meadow 4	0.00	0.00	3.33	0.00	0.00	0.00	0.00	0.00	3.33	3.33
Hamm Meadow 5	0.00	0.00	0.13	1.88	0.47	0.04	0.00	1.02	3.53	3.53
Total	8.71	0.01	11.13	2.55	0.69	0.74	0.01	4.05	27.89	27.89

The Hamm Meadows were acquired after the license, so the vegetation cover typing was based on land use at the time.

Forage quality: Forage quality in both the Hamm and Winter Creek meadows is excellent.

Invasive Plant Species: Extensive invasive plant species work has been completed in the Hamm meadows to control scotch broom (Class C), bull thistle (Class C), Canada thistle (Class C), evergreen blackberry (*Rubus laciniatus*) (Class C), Himalayan blackberry (Class C), field bindweed (*Convolvulus arvensis* [Class C]). Winter Creek meadows have been treated for bull thistle (Class C), Canada thistle (Class C); scotch broom (Class C), and stinging nettle (*Urtica dioica*).

Visual Screen: The Winter Creek Meadows are screened with forested edges and access is successfully blocked by a gated road. Hamm Meadows is currently open access, but due to the surrounding homes there does not seem to be a problem with public access. Screens have been planted adjacent to the highway and along the back of the adjacent property to field 2.

Wildlife: These meadows are one of highest elk use areas and elk use appears to be daily in both areas. Therefore the management goal for these meadows is largely to provide elk forage habitat. In addition Savannah sparrows have been noted in the Hamm meadows. Other wildlife observations frequently noted in these areas are red-tailed hawks (*Buteo jamaicensis*), American goldfinch (*Carduelis tristis*), white-crowned sparrow, and golden-crowned sparrow (*Zonotrichia atricapilla*).

Conclusion:

Winter Creek Meadows are annually mowed and fertilized and invasive plant species are treated as needed. The grasses in Hamm Meadows 1-3 are so dense that they are mowed in the spring

and fall and fertilized every fall. Hamm Meadows 4-5 have been treated for invasive plant species, mostly blackberries and snowberry, and have been top seeded. Other future work will be to correct the drainage in Hamm Meadows to prevent winter flooding.



Figure 20: Hamm Meadows 1



Figure 21: Hamm Meadow 2



Figure 22: Hamm Meadow 3



Figure 23: Hamm Meadow 4



Figure 24: Hamm Meadow 5



Figure 25: Lower Winter Creek



Figure 26: Upper Winter Creek

Unit 18 Reese Meadow

Survey Dates: April 12, 2010

Observer: Kendel Emmerson

Size:

Name	Pre-Initial Inspection Vegetation Cover Type (acres)			Post-Initial Inspection Vegetation Cover Type (acres)
	MD	UM	Total	MD
Reese Meadow	3.48	0.25	3.73	3.73

The Reese Meadow is adjacent to Hwy 503 and bisected by a transmission line. The meadow has existed for several years but required extensive scotch broom removal. Once the scotch broom was controlled the meadow was able to be mowed and fertilized annually.



Figure 23: Reese Meadow

Forage quality: This meadow provides high quality forage.

Invasive Plant Species: This meadow was solid scotch broom (Class C) and was treated for several years before it was under control. Note that each wood stem in the photo above is remnant scotch broom stem.

Visual Screen: The meadow is mostly screened with forested edges, but is open to Reese Road. The forested edge along the highway is mostly deciduous shrubs and trees that it is not effective screening in the winter. Due to limitations from the highway fill slope and Cowlitz Public Utility District (PUD) distribution line; this area cannot be improved with inter-planting.

Wildlife: This area has intermittent elk use with the highest use in the winter. Other wildlife observed include ruby-crowned kinglet (*Regulus calendula*), red-tailed hawk, and black throated gray warbler (*Dendroica nigrescens*).

Conclusion:

The area should be mowed and fertilized at least every other year. The screen along the highway should be interplanted to try to improve the screen. Although this meadow access is open it doesn't appear to have trespass.

Unit 25 Rhododendron and Swift Warehouse Meadows

Survey Dates: May 13, 2010

Observer: Kendel Emmerson

Size:

Name	Pre-Initial Inspection Vegetation Cover Type (acres)					Post-Initial Inspection Vegetation Cover Type (Acres)
	DV	MD	UD	UM	Total	MD
Rhododendron	0.00	2.53	0.25	0.00	2.78	2.78
Swift Warehouse	0.01	3.67	0.01	0.14	3.83	3.82
Total	0.01	6.20	0.26	.14	6.61	6.60

Forage quality: Both meadows meet the vegetation cover type criteria for meadow and provide good quality forage. Swift Warehouse forage quality is limited by shallow rocky soils. To improve forage quality as part of the timber harvest activities in 2012 we removed the top 4 inches of soils, smoothed the surface, removed rocks, and top seeded the area with grass seed.

Invasive Plant Species: Rhododendron has small amounts of Himalayan blackberry (Class C) and scotch broom (Class C), whereas Swift Warehouse had moderate to moderate-high amounts of Himalayan blackberry and scotch broom. As part of the restoration for this meadow we sprayed all of the invasive plant species.

Visual Screen:

The visual screen for Rhododendron is a forested edge on east and west, the south side is row of tall rhododendrons. The north end was recently harvested and has line of sight from the FS road 90 to the meadow. The road is upslope of the meadow so the vehicle traffic does not disturb the elk. The timber harvest area was planted in 2013 and will provide adequate screening over time. Swift Warehouse meadow is well screened on the east and west ends, but the north and south ends are exposed to the road and operations area. The elk are in this area year round and appear to be acclimated to routine traffic and operations.

Wildlife:

Wildlife noted in the area is high elk use in both meadows.

Conclusion:

The meadows have been added to the annual mowing and fertilizer schedule. The trees along the edges and within the meadows have been pruned up to increase sunlight and allow the tractor to mow the edges. Swift Warehouse has had been treated for noxious weeds and had most of the mowing hazards removed.



Figure 24: Rhododendron Meadow



Figure 25: Swift Warehouse Meadow in 2010



Figure 26: Swift Warehouse Meadow in 2013 following invasive plant species control

Unit 26 Pioneer and Elk Point Meadows

Survey Dates: May 9 -May 13, 2010

Observer: Kendel Emmerson

Size:

Name	Pre-Initial Inspection Vegetation Cover Type (acres)				Post-Initial Inspection Vegetation Cover Type (acres)		
	MD	P	UD	Total	MD	SH	Total
Elk Point Meadow (082605CC)	0.00	0.00	1.14	1.14	1.14	0.00	1.14
Pioneer Meadow	0.00	0.04	1.14	1.18	1.18	0.00	1.18
Unit 26-1(North)	2.13	0.00	0.00	2.13	0.00	2.13	2.13
Unit 26-2 (South)	1.48	0.00	0.00	1.48	0.00	1.48	1.48
Total	3.61	0.04	2.28	5.93	2.32	3.61	5.93

Both Unit 26-1 and 26-2 do not meet the vegetation cover type criteria for meadows and was revegetation cover typed as shrublands (SH). Elk Point Meadow (082605CC) is a permanent forage area created as part of the 2008 timber harvest area. The only management this area receives is noxious weed control and fertilizing as needed.

Forage quality:

The forage quality in Pioneer and Elk Point meadows are high quality.

Invasive Plant Species:

Pioneer Meadow has been treated for scotch broom (Class C) and other broad leaf noxious weeds every 2 years. Elk Point Meadow is monitored for noxious weeds but has not required treatments.

Visual Screen:

Both meadows have adequate visual screen on all sides from either a forested edge or topography. The road access to the meadows is gated and there is no unauthorized motorized vehicles.

Wildlife:

Wildlife noted in the area is high elk use in both meadows. Other species noted include downey woodpecker (*Picoides pubescens*), Hammond's flycatcher (*Empidonax hammondii*) and pileated woodpecker (*Dryocopus pileatus*).

Conclusion:

These meadows will continue to be monitored. Pioneer Meadow will be mowed and fertilized as needed. There is no access to Elk Point Meadow so the only management will be to monitor at least every 5 years for noxious weeds and encroachment.



Figure 27: Pioneer Meadow



Figure 28: Unit 26-1 (North)



Figure 29: Unit 26-2 (South)



Figure 30: Elk Point Meadow

4.0 References

PacifiCorp and Cowlitz PUD. 2004. Vegetation Cover Type Mapping. Terrestrial resources [TER] 1.1 to 1-38 in PacifiCorp, and Public Utility District No. 1 of Cowlitz County. June 2003. Final licensee's 2001 technical study status reports for the Lewis River Hydroelectric Projects Merwin Hydroelectric Project, Federal Energy Regulatory Commission Project No. 935, Yale Hydroelectric Project, No. 2071, Swift No. 1 Hydroelectric Project, No. 2111, Swift No. 2 Hydroelectric Project, No. 2213.

PacifiCorp. 2008. Lewis River Wildlife Habitat Management Plan Volume I through IV. Portland, Oregon. December 2008.

**Appendix A:
Summary of Initial Inspection Results**

Appendix A: Summary of Initial Inspections Results for Farmlands, Idle Areas, and Meadows

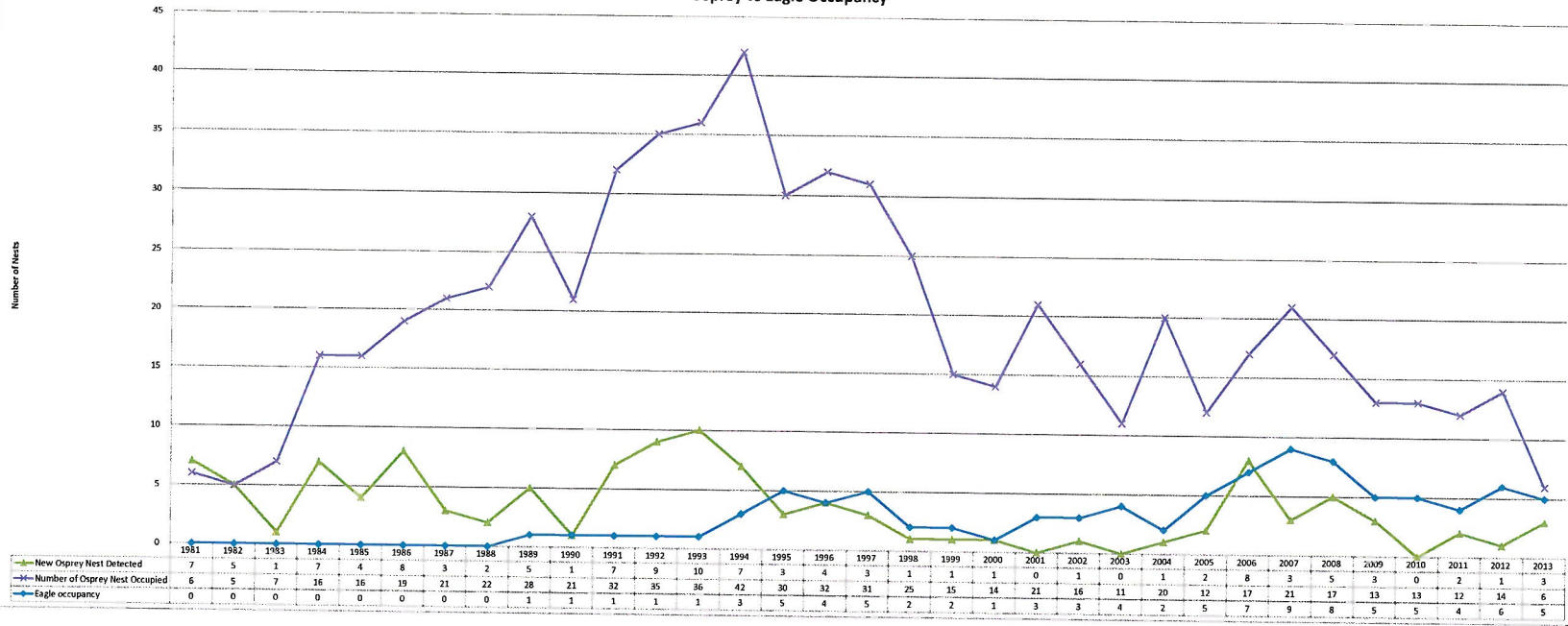
MGT Unit	Area Name	Date of Inspection	Prior VCT													Current VCT					Total forage areas (MD and AG acres) per MGT Unit	Wildlife				Forage Quality	Invasive Plant Species	Visual Screen	Management Priority	Management Recommendations	
			AG	DV	M	MD	MS	OR	P	RES	ROW	SH	UD	UM	Total	AG	MD	SH	OR	Total		Savannah Sparrow	Elk	Deer	Other						
3	Lower Mckee	4/23/2010	0.00	0.00	0.00	0.84	0.06	0.00	0.00	0.00	0.00	0.00	0.14	0.00	1.04	0.00	1.04	0.00	0.00	1.04	2.22	M	H-1	H		H	L	Good	2	Annual mowing and fertilizing	
3	Upper McKee	4/23/2010	0.00	0.00	0.00	1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.18	0.00	1.18	0.00	0.00	1.18		M	H-1	H		H	L	Good	2	Annual mowing and fertilizing	
6	Speelyai	5/26/2010	0.00	0.00	0.00	0.40	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.60	0.00	1.27	1.87	0.60	M	H-1	H	Bear	H	L	Good	1	The adjacent Speelyai Orchard (VCT=OR) is included the total meadow management area.	
8	Leach Field Meadow	9/1/2010	0.00	0.00	0.00	2.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.49	0.00	2.49	0.00	0.00	2.49	2.49	L	M	H		M	M	Fair	4	The property line needs to be surveyed and marked. Plant a visual screen along the property boundary.	
10	Saddle Dam Farm field 1	5/7/2010	2.53	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	2.57	2.57	0.00	0.00	0.00	2.57	37.99	H	H-1	H		H	L	Good	1		
10	Saddle Dam Farm field 2	5/7/2010	7.86	0.57	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	8.46	8.46	0.00	0.00	0.00	8.46			H	H-1	H		H	L	Good	1		
10	Saddle Dam Farm field 3	5/7/2010	7.99	0.01	0.00	0.10	0.00	0.42	0.00	0.00	0.00	0.78	0.00	9.30	9.30	0.00	0.00	0.00	9.30			H	H-1	H		H	L	Good	1	Absorb orchard meadow 0.53 acres into field 3	
10	Saddle Dam Farm field 4	5/7/2010	5.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.36	5.36	0.00	0.00	0.00	5.36			H	H-1	H		H	L	Good	1		
10	Saddle Dam Farm field 5	5/7/2010	3.71	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.07	0.00	3.81	3.81	0.00	0.00	0.00	3.81			H	H-1	H		H	L	Fair	1		
10	Idle Field 1 / 5	5/6/2010	0.00	0.00	0.00	1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.01	1.41	0.00	1.41	0.00	0.00	1.41			M	H	H		M	L	Fair	4		
10	Idle Field 3 / 4	5/6/2010	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.50	0.19	5.89	0.00	5.89	0.00	0.00	5.89			M	H	H		M	L	Fair	4	Douglas-firs less than 7 in. dbh removed to reduce conifer encroachment and mowed and fertilized every 3 years to reduce the snowberry and increase the palatable grasses.	
10	Idle Field 1/2	5/6/2010	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.18	0.00	1.19	0.00	0.00	1.19		M	H	H		M	L	Fair	4	Idle Area 1/2		
12	Bridge	5/26/2010	1.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.29	0.00	1.29	0.00	0.00	1.29	17.69	L	M	H		M	L	Good	3			
12	Lower Hanley-Curry	5/26/2010	0.00	0.00	0.00	4.52	0.00	0.00	0.00	0.00	0.00	1.60	0.00	6.41	0.00	6.41	0.00	0.00	6.41		H	H	H		H	L	Good	2	Consider expanding the meadow into the lower bench area.		
12	Upper Hanley-Curry	5/26/2010	0.00	0.00	0.00	7.65	0.00	0.00	0.00	0.00	0.00	2.30	0.04	9.99	0.00	9.99	0.00	0.00	9.99		H	H	H		H	M	Good	2			
15	Buncombe Hollow Meadow	9/1/2010	0.00	0.00	0.00	0.00	0.34	0.00	0.58	0.00	0.00	0.94	0.00	1.87	0.00	1.87	0.00	0.00	1.87	1.87	L	M	H		h	l	good	2	Recently the area was turned over as part of the 2012 timber harvest activities. Renamed as Buncombe Hollow Meadow		
17	Upper Winter Creek	5/13/2010	0.00	0.00	0.01	3.21	0.00	0.00	0.00	0.00	0.00	0.00	0.13	3.35	0.00	3.35	0.00	0.00	3.35	27.89	H	H-1	H		H	M	Good	1			
17	Lower Winter Creek	5/13/2010	0.00	0.00	0.00	0.25	0.67	0.00	0.22	0.00	0.00	0.00	2.89	4.04	0.00	4.04	0.00	0.00	4.04			H	H-1	H		H	L	Good	1	Meadow was created in 2009	
17	Hamm Field 1	4/22/2010	0.12	0.00	0.00	0.67	0.00	0.00	0.00	0.60	0.00	0.00	0.00	1.39	0.00	1.39	0.00	0.00	1.39			H-1	H-1	H		H	L	Poor	1		
17	Hamm Field 2	4/22/2010	3.95	0.00	0.00	0.99	0.00	0.00	0.00	0.10	0.00	0.00	0.00	5.04	0.00	5.04	0.00	0.00	5.04			H-2	H-1	H		H	L	Poor	1	Correct drainage to reduce winter flooding	
17	Hamm Field 3	4/22/2010	4.64	0.00	0.00	2.55	0.00	0.00	0.00	0.00	0.01	0.00	0.00	7.21	0.00	7.21	0.00	0.00	7.21			H-3	H-1	H		H	L	Poor	1	Correct drainage to reduce winter flooding	
17	Hamm Field 4	4/22/2010	0.00	0.00	0.00	3.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.33	0.00	3.33	0.00	0.00	3.33			M	H-1	H		H	L	fair	1	Correct drainage to reduce winter flooding	
17	Hamm Field 5	4/22/2010	0.00	0.00	0.00	0.13	1.88	0.00	0.47	0.04	0.00	0.00	1.02	3.53	0.00	3.53	0.00	0.00	3.53			M	H-1	H		H	L	Good	1	Correct drainage to reduce winter flooding	
18	Reese Meadow	4/22/2010	0.00	0.00	0.00	3.48	0.00	0.00	0.00	0.00	0.00	0.00	0.25	3.73	0.00	3.73	0.00	0.00	3.73	3.73	H	H	H		H	M	Fair	3			
25	Swift Warehouse Meadow	5/13/2010	0.00	0.01	0.00	3.67	0.00	0.00	0.00	0.00	0.00	0.00	0.01	3.83	0.00	3.82	0.00	0.00	3.82	6.60	M	H-1	H		H	L	Fair	2			
25	Rhododendron Meadow	5/13/2010	0.00	0.00	0.00	2.53	0.00	0.00	0.00	0.00	0.00	0.00	0.25	2.78	0.00	2.78	0.00	0.00	2.78			M	H-1	H		H	L	Fair	2		
26	082605CC (Elk Point Meadow)	5/13/2010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.14	1.14	0.00	1.14	0.00	0.00	1.14	2.32	M	H-1	H		H	L	Good	4	Meadow was created as as part of the 082605 timber harvest		
26	Pioneer Meadow	5/9/2010	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	1.14	1.18	0.00	1.18	0.00	0.00	1.18			M	H-1	H		H	L	Good	3		
26	Unit 26 North	5/9/2010	0.00	0.00	0.00	2.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.13	0.00	2.13	0.00	0.00	2.13			L	L	L		L	L	Good	None	Not a meadow add to shrublands	
26	Unit 26 South	5/9/2010	0.00	0.00	0.00	1.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.48	0.00	1.48	0.00	0.00	1.48			L	L	L		L	L	Good	None	Not a meadow add to shrublands	
Total			37.82	0.59	0.01	43.03	3.15	0.49	1.31	0.74	0.01	12.19	6.96	0.68	106.98	29.50	73.90	3.61	1.27	107.01	103.40										

The 0.03 difference in Prior VCT to Current VCT acres is due to rounding
 Prior VCT for MD+AG= 37.82+43.03=80.85. Overall gain of 103.40-80.85=22.55 acres from either VCT correction and created/expanded habitats.

Habitat Potential = L= low because habitat is missing two or more important habitat suitability indexes
 Habitat Potential = M= Moderate and habitat is missing one important habitat suitability indexes
 Habitat Potential = H= High and habitat has all required habitat needs for species
 Habitat Potential = H_1= High and habitat has all required habitat needs for species and species or sign of the species were observed in the area

Management Priority:
 1= high wildlife habitat potential as indicated by use management should occur annual and biannually if prescribed
 2 = moderately high wildlife habitat potential area should be managed annually but may be deferred for at least one year if needed.
 3 = moderate wildlife habitat potential area should be managed annually but may be deferred for two years if needed.
 4=low wildlife potetial passive management every 5 years.

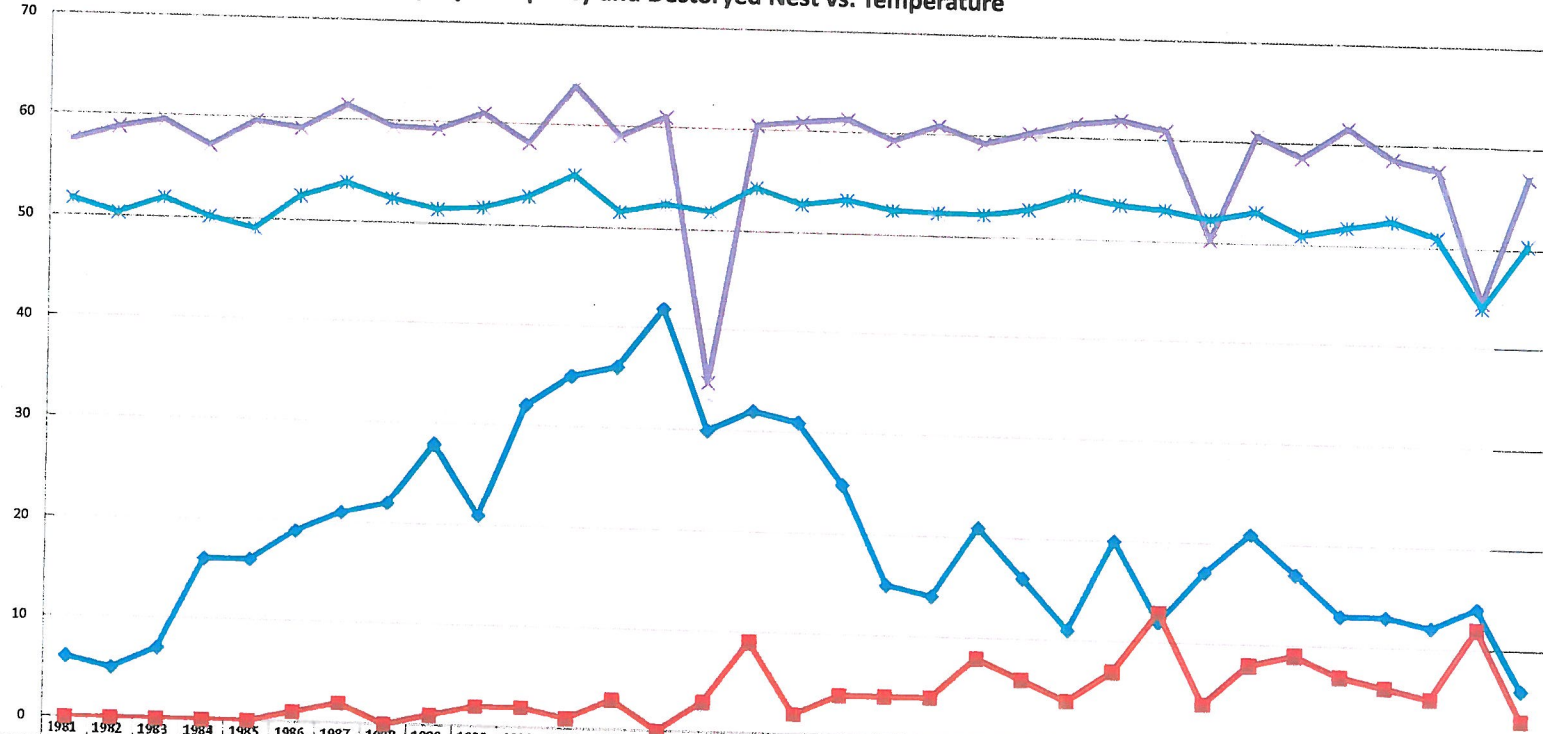
Osprey vs Eagle Occupancy



Merwin Dam WRCC data 455305

	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Winter (Dec-Feb)	Spring (March- May)	Summer (June- August)	Fall (Septem- ber- November)	Breeding Season (April- July)
Average (1981-2013)	39.28	41.50	45.09	48.31	55.05	60.50	66.25	66.76	62.31	53.32	44.45	38.56	51.71	37.26	49.48	64.50	53.36	59.37
1981	41.98	40.56	44.92	46.31	53.39	56.68	62.32	68.76	60.84	51.11	46.95	38.97	51.62	121.51	48.21	62.59	52.97	57.49
1982	34.87	38.21	42.9	44.98	55.13	63.03	65.1	65.45	61.63	52.79	41.13	38.32	50.30	111.40	47.67	64.53	51.85	58.74
1983	42.23	43.62	47.87	50.40	59.06	58.73	63.00	66.34	59.40	53.02	45.62	32.85	51.85	118.70	52.44	62.69	52.68	59.51
1984	40.42	42.86	46.58	46.05	51.84	57.12	65.81	64.94	59.72	48.94	42.42	34.66	50.11	117.94	48.16	62.62	50.36	57.15
1985	36.45	36.14	41.69	48.80	54.68	60.00	70.42	64.13	57.18	50.06	33.50	35.79	49.07	108.38	48.39	64.85	46.91	59.61
1986	42.11	40.16	48.69	45.97	54.71	63.12	60.82	70.47	58.68	57.21	45.72	40.24	52.33	122.51	49.79	64.80	53.87	59.02
1987	37.58	44.5	45.97	53.33	58.05	63.43	64.45	67.74	65.62	58.85	48.28	37.31	53.76	119.39	52.45	65.21	57.58	61.40
1988	37.81	43.05	44.47	50.57	54.05	59.9	66.5	65.95	62.43	58.56	43.7	40.27	52.27	121.13	49.70	64.12	54.90	59.39
1989	37.9	33.98	42	52.4	54.73	62.52	62.53	64.13	65.38	52.89	46.45	41.52	51.37	113.4	49.71	63.06	54.91	59.26
1990	40.45	36.73	46.68	52.82	54.31	60.32	69.40	67.60	64.42	49.85	44.22	32.73	51.63	109.91	51.27	65.77	52.83	60.89
1991	37.65	47.59	42.85	47.6	51.97	56.73	67.05	67.24	65.25	55.13	42.61	41.97	52.82	127.21	47.47	63.67	54.33	58.12
1992	42.71	48.28	52.63	53.42	62.42	65.73	68.4	69	61.33	55.65	44.4	36.23	55.02	127.22	56.16	67.71	53.79	63.79
1993	34.29	39.2	47.02	48.33	59.74	59.33	61.15	66.45	65.1	57.1	40.78	39.95	51.54	113.44	51.70	62.31	54.33	59.00
1994	43.11	38.54	47.65	52.28	57.97	59.75	68.44	66.5	65.63	51.73	38.3	38.73	52.38	120.38	52.63	64.90	51.89	60.99
1995	41.95	0	45.73	48.53	0	60.75	0	64.05	0	52.77	48.57	0	51.76	41.95	31.42	41.60	33.78	34.67
1996	0	0	45.45	50.12	52.06	60.52	71.28	68.11	59.45	52.56	44.55	38.15	54.23	38.15	49.21	66.64	52.19	60.42
1997	38.77	41.98	43.58	48.27	59.98	60.47	66.1	69.23	64.38	51.56	48.65	39.89	52.74	120.64	50.61	65.27	54.86	60.81
1998	39.9	43.82	46.37	50.88	54.18	62.3	69.85	68.87	65.93	54.21	45.65	37.24	53.27	120.96	50.48	67.01	55.26	61.22
1999	40.38	39.5	43.56	49.85	53.34	58.71	66.13	68.31	64.23	54.57	48.05	41.77	52.37	121.65	48.92	64.38	55.62	59.27
2000	37.85	42.84	44.59	53.57	55.53	63.12	66.37	65.53	61.89	53.82	41.95	40.03	52.26	120.72	51.23	65.01	52.55	60.82
2001	41.05	40.95	46.25	47.53	57.58	59.24	65.13	66.58	63.33	52.5	47.35	39.13	52.22	121.13	50.45	63.65	54.39	59.21
2002	38.9	42.07	42	49.43	54.02	63.38	67.95	66.77	64.2	53.71	49.12	41.92	52.79	122.89	48.48	66.03	55.68	60.31
2003	44.71	0	45.06	48.47	56.1	64.72	69.71	67.94	64.45	0	42.33	39.95	54.34	84.66	49.88	67.46	35.59	61.39
2004	38.06	43.1	48.26	52.45	55.52	62.65	69.47	69.18	60.77	54.85	45.9	41.92	53.51	123.08	52.08	67.10	53.84	61.85
2005	40.76	45.68	49.34	50.17	58.82	58.92	67.31	69.35	60.5	54.24	43.77	38.52	53.11	124.96	52.78	65.19	52.84	60.91
2006	41.31	40.3	43.02	50.75	0	63.75	69.32	67.44	63.92	52.05	43.42	40.05	52.3	121.66	31.26	66.84	53.13	50.25
2007	37	41.84	47.31	49.8	57.23	61.27	68.61	66.19	60.43	51.23	43.8	0	53.15	78.84	51.45	65.36	51.82	60.62
2008	35.21	40.47	42.11	44.12	56.1	58.62	66.44	67.68	63.22	53.44	48.33	35.56	50.94	111.24	47.44	64.25	55.00	58.59
2009	37.15	40.8	40.39	48.43	57.4	62.63	72.03	67.35	64.7	50.87	43.67	36.05	51.79	114	48.74	67.34	53.08	61.57
2010	43.55	45	46.56	47.8	52.68	59.02	66.66	66.87	62.23	55.11	43.47	41.13	52.51	129.68	49.01	64.18	53.60	58.61
2011	39.77	39	42.68	44.5	52.61	59.37	63.94	67.66	64.63	54.2	43.52	40.21	51.01	118.98	46.60	63.66	54.12	57.62
2012	39.67	42.6	41.74	38.13	33.81	46.9	52	51.85	49.23	50.5	42.73	39.17	44.03	121.44	37.89	50.25	47.49	44.54
2013	31.31	41.45	41.87	28.08	57.58	63.73	66.27	69.52	63.92	51	46.04	35.08	50.4	107.84	42.51	66.51	53.65	57.04
Sum	1256.86	1244.82	1487.79	1594.14	1706.59	1996.46	2119.96	2203.18	1994.02	1706.08	1464.95	1195.31	1714.80					
Years	32.00	29.00	32.00	33.00	31.00	33.00	32.00	33.00	32.00	32.00	32.00	31.00	26.00					
Mean	39.28	42.92	46.49	48.31	55.05	60.50	66.25	66.76	62.31	53.32	45.78	38.56	65.95					

Osprey Occupancy and Destroyed Nest vs. Temperature

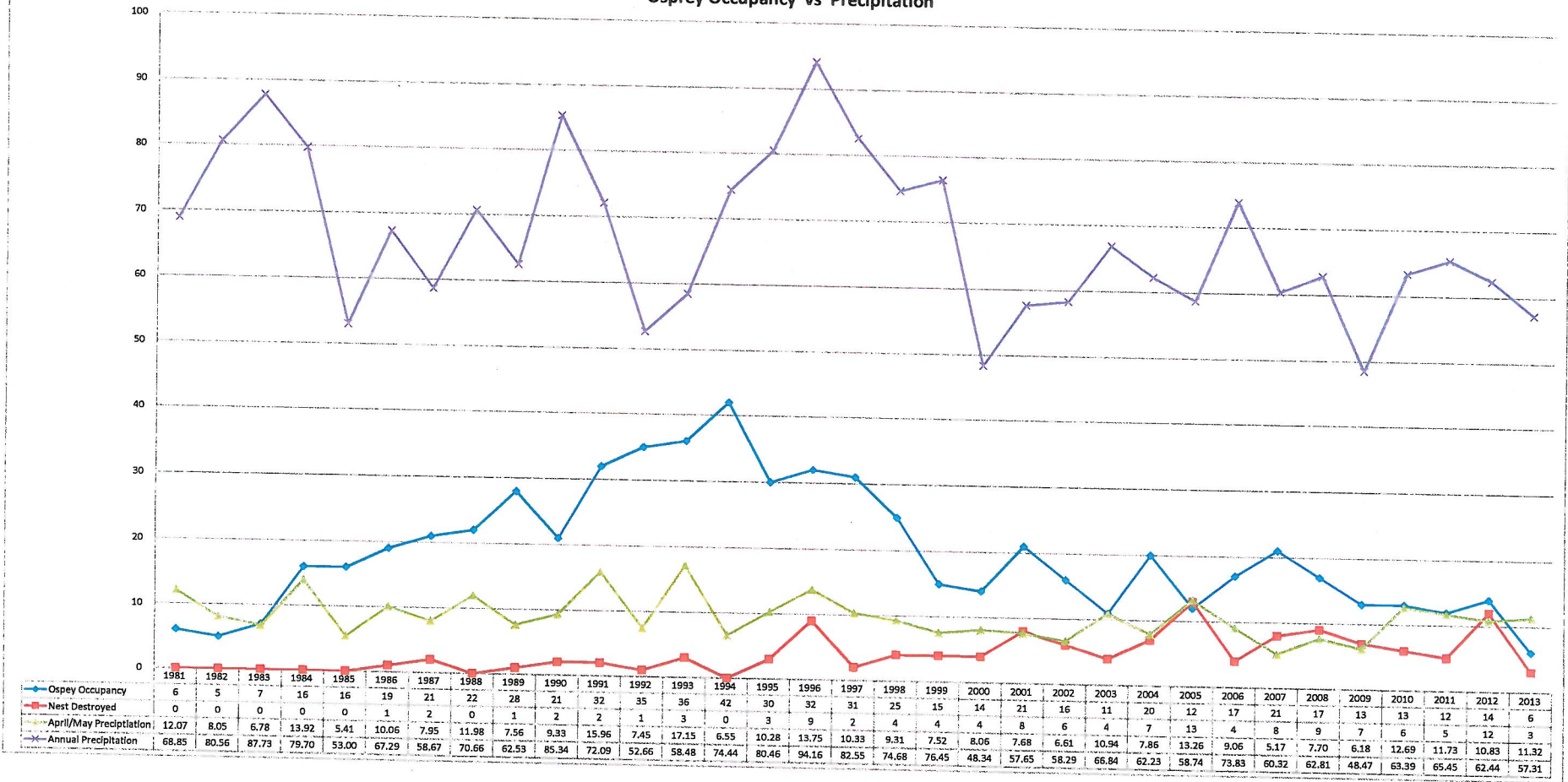


	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Osprey Occupancy	6	5	7	16	16	19	21	22	28	21	32	35	36	42	30	32	31	25	15	14	21	16	11	20	12	17	21	17	13	13	12	14	6
Number of Destroyed Nests	0	0	0	0	0	1	2	0	1	2	2	1	3	0	3	9	2	4	4	4	8	6	4	7	13	4	8	9	7	6	5	12	3
Breeding Average Temp	57.49	58.74	59.51	57.15	59.61	59.02	61.40	59.39	59.26	60.89	58.12	63.79	59.00	60.99	34.67	60.42	60.81	61.22	59.27	60.82	59.21	60.31	61.39	61.85	60.91	50.25	60.62	58.59	61.57	58.61	57.62	44.54	57.04
Average Annual Temp	51.62	50.30	51.85	50.11	49.07	52.33	53.76	52.27	51.37	51.63	52.82	55.02	51.54	52.38	51.76	54.23	52.74	53.27	52.37	52.26	52.22	52.79	54.34	53.51	53.11	52.3	53.15	50.94	51.79	52.51	51.01	44.03	50.4

Precipitation

	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Winter (Dec-Feb)	Spring (March-May)	Summer (June-August)	Fall (September-November)	Breeding Season (April-July)	April	May
Average (1971-2006)	10.06	7.89	7.37	5.72	4.08	3.01	1.20	1.78	3.07	5.61	10.77	11.54	72.07	29.49	17.16	5.98	19.45	14.01		
Average (1981-2013)	9.45	7.32	7.47	5.80	4.03	2.98	0.97	1.22	2.84	5.67	10.68	11.54	68.86	26.60	17.30	5.17	19.19	13.78		
1981	2.42	9.43	5.01	7.32	4.75	7.26	0.5	0.19	3.09	6.98	7.4	14.5	68.85	26.35	17.08	7.95	17.47	19.83	12.07	9.83
1982	16.87	11.03	5.73	6.83	1.22	1.71	1.32	1.19	4.12	7.39	8.65	14.5	80.56	42.40	13.78	4.22	20.16	11.08	8.05	9.83
1983	14.53	11.80	9.66	4.08	2.70	5.21	4.91	2.70	3.73	4.04	17.18	7.19	87.73	33.52	16.44	12.82	24.95	16.90	6.78	9.83
1984	8.33	8.84	8.24	7.27	6.65	5.72	0.00	0.19	3.66	7.91	15.22	7.67	79.70	24.84	22.16	5.91	26.79	19.64	13.92	9.83
1985	0.38	6.48	8.00	3.05	2.36	4.35	0.69	1.59	5.17	7.68	10.13	3.12	53.00	9.98	13.41	6.63	22.98	10.45	5.41	9.83
1986	9.25	9.62	5.19	5.59	4.47	0.83	2.12	0.52	6.98	3.62	12.46	6.64	67.29	25.51	15.25	3.47	23.06	13.01	10.06	9.83
1987	11.09	7.42	10.9	3.29	4.66	0.86	1.26	0.72	0.63	0.11	6.25	11.48	58.67	29.99	18.85	2.84	6.99	10.07	7.95	9.83
1988	8.45	5.75	9.92	5.6	6.38	2.91	1.44	0.75	2.91	1.6	17	7.95	70.66	22.15	21.90	5.10	21.51	16.33	11.98	9.83
1989	10.61	5.29	12	4.02	3.54	2.28	1.27	4	0.74	5.12	8.95	4.71	62.53	20.61	19.56	7.55	14.81	11.11	7.56	9.83
1990	17.72	14.92	5.83	5.60	3.73	4.19	0.78	1.79	0.80	11.98	10.45	7.55	85.34	40.19	15.16	6.757	23.23	14.30	9.33	9.83
1991	6.52	8.08	9.07	11.46	4.5	2.78	0.21	0.75	0.69	3.62	14.62	9.79	72.09	24.39	25.03	3.74	18.93	18.95	15.96	9.83
1992	7.77	5.52	2.46	7.05	0.4	0.79	0.69	0.73	3.35	2.8	10.91	10.19	52.66	23.48	9.91	2.21	17.06	8.93	7.45	9.83
1993	5.84	0.83	7.49	11.72	5.43	8.18	3.67	0.44	0.07	2.1	3.79	8.92	58.48	15.59	24.64	12.29	5.96	29.00	17.15	9.83
1994	8	8.67	5.14	4.88	1.67	3.39	0.12	0.39	2.06	8.97	15.68	15.47	74.44	32.14	11.69	3.9	26.71	10.06	6.55	9.83
1995	8.34	5.85	6.4	6.05	4.23	3.16	1.76	3.49	8.49	17.85	9.35	80.46	23.54	16.68	8.41	31.83	15.20	10.28	9.83	9.83
1996	12.19	13.15	3.5	9.21	4.54	2.59	1.09	1.01	3.59	11.15	11.55	20.59	94.16	45.93	17.25	4.69	26.29	17.43	13.75	9.83
1997	12.15	6.49	12.56	6.66	3.67	6.72	1.24	2.72	5.05	10.26	8.78	6.25	82.55	24.89	22.89	10.68	24.09	18.29	10.33	9.83
1998	10.65	7.41	6.59	2.35	6.96	2.59	0.36	0.01	1.88	5.31	15.25	15.32	74.68	33.38	15.9	2.96	22.44	12.26	9.31	9.83
1999	11.35	15.74	7.75	1.87	5.65	0	1.17	1.34	0.21	4.46	14.42	12.49	76.45	39.58	15.27	2.51	19.09	8.69	7.52	9.83
2000	10	6.2	6.07	3.12	4.94	2.29	0.45	0.65	3.95	5.52	5.15	0	48.34	16.2	14.13	3.39	14.62	10.80	8.06	9.83
2001	4.06	2.78	5.87	5.53	2.15	2.92	1.23	1.95	1.2	7.19	9.71	13.06	57.65	19.9	13.55	6.1	18.1	11.83	7.68	9.83
2002	13.88	5.85	8.01	4.05	2.56	2.38	0.2	0.14	2.89	1.07	5.01	12.25	58.29	31.98	14.62	2.72	8.97	9.19	6.61	9.83
2003	9.83	5.79	11.01	8.59	2.35	0.85	0.12	0.11	2.07	5.55	8.83	11.74	66.84	27.36	21.95	1.08	16.45	11.91	10.94	9.83
2004	11.71	8.12	3.74	2.53	5.33	2.68	0.11	5.72	3.51	8.04	4.82	5.92	62.23	25.75	11.6	8.51	16.37	10.65	7.86	9.83
2005	6.53	2.32	6.89	7.42	5.84	3.24	1.11	0.57	0	7.32	9.98	7.52	58.74	16.37	20.15	4.92	17.3	17.61	13.26	9.83
2006	17.76	5.25	6.4	4.79	4.27	1.53	0.79	0.46	1.69	4.38	18.91	7.6	73.83	30.61	15.46	2.78	24.98	11.38	9.06	9.83
2007	6.54	9.24	6.37	3.36	1.81	1.92	0.95	1.18	1.72	5.52	6.25	15.46	60.32	31.24	11.54	4.05	13.49	8.04	5.17	9.83
2008	10.15	7.74	9.72	5.36	2.34	2.79	0.56	2.19	0.37	3.56	10.65	7.38	62.81	25.27	17.42	5.54	14.58	11.05	7.70	9.83
2009	11.15	1.78	5.93	6.18	0	0.77	0.19	1.24	2.18	5.15	8.77	5.13	48.47	18.06	12.11	2.2	16.1	7.14	6.18	9.83
2010	9.53	5.47	6.85	5.83	6.86	5.15	0.62	0.01	5.21	6.5	11.36	0	63.39	15	19.54	5.78	23.07	18.46	12.69	9.83
2011	9.76	6.55	11.79	9.04	2.69	1.08	0.93	0.19	2.13	4.8	11.36	5.13	65.45	21.44	23.52	2.2	18.29	13.74	11.73	9.83
2012	0	7.68	12.29	6.98	3.85	4.04	0.18	0	0.06	7.22	8.4	11.74	62.44	19.42	23.12	4.22	15.68	15.05	10.83	9.83
2013	8.58	4.57	4.1	4.78	6.54	1.12	0.02	1.39	9.73	1.7	6.67	8.11	57.31	21.26	15.42	2.53	18.1	12.46	11.32	9.83
Mean	9.45	7.32	7.47	5.80	4.03	2.98	0.97	1.22	2.84	5.67	10.68	9.83	68.86	26.13	17.18	5.19	19.12	13.68	9.83	

Osprey Occupancy vs Precipitation



Osprey Occupancy vs April and May Precipitation

