

Pintail Habitat Use and Abundance During Spring Migration in the Klamath Basin and
Other Southern Oregon-Northeastern California locations.

Progress Report 2002

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INTRODUCTION

The Klamath Basin and other areas in the Southern Oregon-North Eastern California (SONEC) region provide critical spring staging habitat for northern pintails (*Anas acuta*) and other waterfowl in the Pacific Flyway. Most (75-85%) female pintails equipped with satellite transmitters during late winter in the Central Valley of California visited the SONEC region on their way to Alaska and Prairie-Parkland breeding areas. Pintails are a species of special concern because of their continued low populations despite improved habitat conditions on northern breeding areas. The spring period may be especially important for early-nesting species such as pintails but little is known about pintail habitat needs during spring migration. Drought and redirection of water supplies once available for wetland management may greatly reduce the area and quality of wetland habitats in the Klamath Basin. Wise future allocation of the limited KB water supplies requires a thorough understanding of the impacts on all resources impacted. Information on abundance and spring ecology of pintails in the Klamath Basin and vicinity is critically needed.

OBJECTIVES

- 1) Measure diurnal and nocturnal habitat use by pintails in SONEC during spring.
- 2) Estimate abundance of pintails and other waterfowl in SONEC during spring.

STUDY AREA

The SONEC region encompasses all major wetland complexes in the intermountain reaches of Southern Oregon and Northeastern California. SONEC was divided into seven sub-regions, based on topographic features. Each sub-region was comprised of several individual areas (Figure 1).

The Upper Klamath sub-region lies north of Highway 140 between Keno and Lakeview, Oregon. The eastern boundary is Highway 31 with the western boundary to the west of Upper Klamath Lake and continuing down to Keno. The Upper Klamath sub-region includes Upper Klamath Lake, Agency Lake, Sycan Marsh, Klamath Marsh, and the Williamson River Ranch.

The Lower Klamath sub-region lies south of Highway 140, east as far as Drews Reservoir, California. The eastern side is bounded by several forest service roads but roughly forms a north-south line between Drews Reservoir and Hackmore California. The southern boundary is Highway 39, northwest to Highway 10, along Highway 10 to the west and then Forest Service road 46N21 west to Macdoel. The western boundary of this sub-region lies west of the Butte Valley State Wildlife Area, North to Keno, Oregon. This sub-region includes Lower Klamath and Tule Lake NWRs, Butte Valley Wildlife Area, Klamath River Game Management Area, Clear Lake NWR, and numerous small reservoirs and wetlands.

The Modoc Plateau sub-region shares its western boundary with the Lower Klamath sub-region but continues southward following Highway 139 from Canby, California to Said Valley Reservoir continuing to the southeast along Termo-Grasshopper road through the Town of Termo, California east to the Warner Mountains, which forms the eastern boundary. The northern boundary is the short stretch of Highway 140 between Drews Reservoir and Lakeview California, and includes the ranch fields 5 miles to the north of Lakeview. This sub-region includes Goose Lake, Modoc NWR, Fairchild Swamp, and other wetlands in the Devils Garden area of the Modoc National Forest.

The Northeast California sub-region shares boundaries with the Lower Klamath and Modoc Plateau sub-regions ending in the south at California Highway 22. The western boundary follows Highway 89 Northwest from Hat Creek to the intersection of Interstate 5 then follows the interstate to Montague, California. Key areas in this sub-region are Fall River Valley, Big Valley and Ash Creek Wildlife Area.

The Summer Lake sub-region lies primarily east of Highway 31 and west of Highway 395. The southern terminus is at the town of Valley Falls, Oregon while the north boundary is Christmas Valley Road. Included in this sub-region are the Lower Chewaucan River and the Silver Lake basin, which are west of the highway but east of Winter Rim, which is the most prominent physical feature along the Summer Lake basin. Within this sub-region are the Chewaucan Marsh, the Summer Lake Wildlife Area, and Lake Abert.

The Warner Valley sub-region lies east of Oregon Highway 395. Highway 140 forms the primary southern boundary, though the very south terminus of the valley is south of the highway and is included in this sub-region. The north boundary is the line drawn between French Glen, west to Highway 395 just north of Alkali Lake. The eastern boundary is the Steens Mountain range. This sub-region includes the Warner Valley and Hart Mountain NWR.

The Malheur sub-region starts on the west at Highway 395. The Southern boundary is shared with the Warner Valley sub-region. The northern boundary is Highway 20 and the eastern boundary is the east side of the Steens Mountains range. The key habitats are the Harney Basin, the Silvies, Blitzen River drainages, and Malheur NWR.

METHODS

Objective 1-Habitat Use

Pintail trapping and Marking

We used rocket nets over baited and unbaited sites to capture pintails at Sacramento NWR (n=40), Llano Seco NWR (n= 48), Howard Slough Wildlife Area (n= 30) and Little Dry Creek Wildlife Area (n= 32) during 1-19 December 2002. We held all pintails in plastic crates, following approved Animal Care and Use guidelines and randomly

selected pintails for radiotagging among individual captures roughly in proportion to pintail distribution in the Sacramento Valley.

We attached Dwyer-harness VHF radio transmitters to immature females ($n = 56$) and adult females ($n = 62$) as planned and also radiotagged 32 adult male pintails with radiotags salvaged from earlier studies. We released all pintails at the capture site within 24 hours after capture. Approximately 3 weeks remained in the California hunting season after our last capture and 6 radiotagged pintails (2 immature females, 1 adult female, 3 males) were shot. Thus, 144 radiotagged pintails were available at the end of hunting season to migrate into the SONEC region.

Radio Tracking

Each week during 1 February – 31 May, we attempted to determine 2 day (one hour before sunrise) and 2 night (one hour after sunset) locations of each radiotagged pintail that was in each SONEC sub-region. We scanned the entire SONEC region twice weekly using truck-mounted directional antennae and searched the SONEC and Central Valley regions at least twice monthly using aircraft.

We estimated bird locations with three bearings obtained from truck-mounted dull-yagi, null-peak telemetry systems. We entered bearings directly into laptop computers (Gateway Solo5350) that were mounted in each tracking vehicle so that precision of locations could be determined while in the field. (The presence of the computer generated little radio interference while tracking.). We calculated error ellipses to 95% confidence using Location Of A Signal (LOAS v.2.04) triangulation software (Ecological Software Solutions). We set a maximum target error ellipse size at 10 ha, although we relaxed this somewhat as distance from the target increased if habitat polygon size was large. We plotted error ellipses in ARCVIEW (ESRI) using available GIS habitat layers to judge whether precision was adequate to distinguish habitat use.

Habitat Classification

We classified habitat 3 ways.

1) Across the entire SONEC region, we used a National Land Cover GIS data set produced by USGS as a background map to classify the SONEC landscape into four broad habitat categories: Cropland, Marsh, Upland, and Aquatic. National Land Cover data is based on 30-meter thematic-mapper landsat data. In some instances, we used information from local land managers to update this coverage.

2) Tracking technicians attempted to visually identify habitats used by radiotagged pintails. These visual classifications, supplemented with information from area managers, provided more detailed classification on wetland and crop type than the National Land Cover GIS background.

3) Managers of Lower Klamath and Tule Lake NWRs provided additional information on vegetation species, water management, and field treatment (e.g., burned, plowed, etc) to further classify habitats used by radiotagged pintails on these areas.

Objective 2-Waterfowl Abundance

Aerial Surveys

In addition to the midwinter survey, 5 aerial waterfowl surveys of the SONEC region were conducted during 2002, on 21-22 February, 13-14 March, 27-28 March, 18-19 April, and 2-3 May. Abundance was tallied by species (n=25) and SONEC area (n=52).

PRELIMINARY RESULTS

Objective 1 - Habitat Use

Use of SONEC Region

We detected 102 radiotagged pintails in the SONEC region. This was 70.8% of the radiotagged pintails that were alive in the Central Valley at the end of hunting (Table 1). The first radiotagged pintails arrived in SONEC on February 7, when 3 were detected in the Lower Klamath sub-region. The Lower Klamath sub-region was the most visited sub-region (Table 1) 29% of the radiotagged pintails in SONEC visited more than one sub-region. Use of SONEC sub-regions was similar by Sacramento Valley capture site (Table 1) and by pintail age and sex (Table 2); Duration of stay ranged from <1 day to 95 days and averaged 36.8 days. Duration of stay was shorter in Malheur than other sub-regions (Table 3). Five radiotagged pintails were still in SONEC (Lower Klamath, Summer Lake, Modoc Plateau, and Warner Valley sub-regions) when we stopped systematic tracking on June 10. On June 6, we documented one of these on a nest of 6 eggs in a hay field, north of Goose Lake, Oregon.

General Habitat Use

We determined 2,224 pintail locations in SONEC during 7 February – 10 June, 2002. Overall, Marsh and flooded uplands were the most important general habitats for pintails. However, pintail use of general habitat types varied somewhat among SONEC sub-regions (Table 4). Marsh was most important in Upper and Lower Klamath sub-regions, while flooded uplands were most important to pintails in Northeast California and Summer Lake sub-regions. In Modoc Plateau, Malheur and Warner Valley use was evenly split between marsh and flooded uplands. Cropland was important habitat in Lower Klamath and Warner Valley. Nearly all locations were precise enough to allow habitat determination, but geophysical features and lack of roads made collecting precise locations in Warner Valley more difficult so that 9% of the locations there were not usable. (Table 4)

Use of Specific Habitat Types

Overall, pasture (24.4%) was the most important habitat used by pintails in the SONEC during spring, followed by seasonal-hemi marsh (16.3%) and cereal cropland (12.4%) (Table 5). Use of specific habitat types varied somewhat among SONEC sub-regions. Pasture was especially important in Summer Lake and Modoc Plateau and was important in all sub-regions except Lower Klamath, where seasonal hemi-marsh and cereal croplands were more important. Pasture was especially important in Summer Lake because of the ranch management in the Chewaucan Marsh area. Permanent hemi-marsh was surprisingly important in the Malheur sub-region.

Habitat Use at Tule Lake and Lower Klamath NWRs

Use of habitats at Tule Lake and Lower Klamath NWRs differed by management. Freshwater marsh with late successional plants that were plowed received lower use than other late successional marsh (Table 6). Use of some habitats differed during day and night. On Lower Klamath NWR, use of permanent marsh, late successional seasonal, and flooded grain was higher during day than at night while flooded grassland use was greater at night than during the day.

Objective 2 – Waterfowl Abundance

Abundance of waterfowl in the SONEC region ranged from 210,000 during the midwinter survey (i.e., ~15 January) to 2,117,900 during 13-14 March, when abundance of pintails peaked at 697,800 (Figure 2). Pintail abundance declined more quickly than for other waterfowl.

FUTURE PLANS

Data analysis will continue, including summary of habitat use by month, day and night, and age and sex. Estimates of habitat availability will be determined where possible so habitat selection can be determined. Aerial survey results will be summarized by species, area, and sub-region. Pending continued funding, a second field season of data collection will begin with pintail trapping in December 2002 and tracking and aerial surveys in SONEC during February – June, 2003.

Table 1. Percent of the 144 radiotagged northern pintails (*Anas acuta*) that were alive in the Central Valley of California at the end of hunting season from each Central Valley capture site that were detected visiting each Southern Oregon-NE California (SONEC) sub-region during 1 February – 10 June, 2002. Sub-region percents do not sum to SONEC total because 29% of pintails visited more than one sub-region.

Capture Site	n	Lower Klamath	Upper Klamath	Northeast California	Modoc Plateau	Summer Lake	Malheur	Warner Valley	Any SONEC Sub-region	Not Detected In SONEC
Howard Slough	30	40.0	13.3	0	6.7	6.7	6.7	13.3	56.7	43.3
Little Dry Creek	30	40.0	10	6.7	3.3	10	20	6.7	63.3	36.7
Llano Seco NWR	47	42.6	8.5	12.8	12.8	12.8	8.5	8.5	74.5	25.5
Sacramento NWR Unit 6	23	65.2	34.8	8.7	13.0	8.7	8.7	8.7	78.3	21.7
Sacramento NWR Unit 8	14	50.0	21.4	14.3	7.1	7.1	7.1	0	92.9	7.1
All Capture Sites	144	45.8	15.3	8.3	9.0	9.7	10.4	8.3	70.8	29.2

Table 2. Percent of the 144 radiotagged northern pintails (*Anas acuta*) of each age and sex that were alive in the Central Valley of California at the end of hunting season that were detected visiting each Southern Oregon-NE California (SONEC) sub-region during 1 February – 10 June, 2002. Sub-region percents do not sum to SONEC total because 29% of pintails visited more than one sub-region.

	n	Lower Klamath	Upper Klamath	Northeast California	Modoc Plateau	Summer Lake	Malheur	Warner Valley	All SONEC	Not Detected In SONEC
Adult Females	61	19.4	7.6	4.2	5.6	6.3	4.9	4.2	80.3	19.7
Immature Females	54	17.4	4.2	3.5	3.5	2.1	2.8	3.5	63.0	37.0
Adult Males	29	7.6	4.2	0.7	0.0	1.4	3.5	0.7	65.5	34.5
Total	144	44.4	16.0	8.3	9.0	9.7	11.1	8.3	70.8	29.2

Table 6. Percent of pintail locations in specific habitat and management types on Lower Klamath and Tule Lake National Wildlife Refuges during 7 February – 10 June, 2002.

Habitat Type and Management	Lower Klamath NWR			Tule Lake NWR		
	% Day	% Night	Combined	% Day	% Night	Combined
Cropland-Grain	16.8	8.2	12.3	9.1	19.4	13.5
Upland-Grassland-Flooded	5.7	21.2	13.2			
Upland-Hay-Flooded	0.6	0	0.3			
Seasonal Marsh (SM)-Early Successional	10.4	14.4	12.3	75.0	65.7	71.0
SM- Late Successional-Burned	22.5	21.2	21.9			
SM- Late Successional-Plowed	4.7	2.1	3.5			
SM-Late Successional-Seasonal	28.8	28.8	28.8			
Permanent Marsh	10.4	4.1	7.4	15.9	14.9	15.5
All Habitats	100	100	100	100	100	100

APPENDIX

Appendix 1. Number of locations by Pintail identifier and SONEC sub-region.

Pintail Identifier	Lower Klamath	Upper Klamath	Northeast California	Modoc Plateau	Summer Lake	Malheur	Warner Valley	Total Locations
4012	26	0	0	0	0	0	0	26
4036	0	0	2	6	0	0	0	8
4092	5	0	0	0	0	0	0	5
4102	43	4	0	0	0	0	0	47
4122	6	0	10	0	0	0	0	16
4153	26	0	8	0	0	0	0	34
4161	18	0	0	0	0	0	0	18
4176	0	0	1	0	0	0	25	26
4198	0	0	0	0	0	0	25	25
4207	59	0	0	0	0	0	0	59
4221	5	0	0	0	0	0	0	5
4232	16	0	0	0	0	0	0	16
4242	0	0	0	44	0	0	0	44
4283	0	0	0	0	0	5	0	5
4301	0	2	2	10	0	0	0	14
4308	10	0	0	0	0	0	0	10
4318	0	0	0	0	0	0	39	39
4342	8	0	0	12	0	0	0	20
4367	0	0	0	0	0	8	0	8
4375	0	26	0	0	0	0	0	26
4385	16	0	0	0	0	0	28	44
4404	3	17	0	0	0	0	0	20
4415	0	0	0	0	0	13	0	13
4425	0	0	0	6	0	0	0	6
4463	24	0	0	0	0	0	0	24
4486	0	0	0	0	0	0	18	18
4517	39	8	0	0	0	0	0	47
4526	15	0	0	0	20	0	0	35
4536	0	0	0	1	0	0	12	13
4573	11	3	0	0	0	0	0	14
4581	0	0	0	0	2	0	0	2
4589	13	5	0	0	31	0	0	49
4597	7	11	0	0	0	0	0	18
4610	0	0	0	12	0	0	0	12
4621	0	0	0	8	0	0	0	8
4640	4	0	0	0	0	3	0	7
4650	29	0	0	0	0	0	0	29
4662	9	2	0	0	0	7	3	21
4665	0	18	0	0	0	0	0	18
4670	20	0	0	0	0	0	0	20
4692	1	0	22	0	0	0	0	23
4702	24	0	0	0	22	0	0	46
4713	16	2	0	0	0	0	0	18
4731	20	0	0	0	0	0	0	20
4753	20	0	0	0	0	4	0	24
4762	0	8	12	0	0	0	0	20
4773	14	8	0	0	0	0	0	22
4782	0	0	0	0	40	0	0	40
4810	6	14	0	0	0	0	0	20

4825	21	0	0	0	0	0	0	21
4837	2	0	0	0	0	0	0	2
4848	6	14	0	23	0	0	0	43
4874	0	0	0	10	11	0	0	21
4880	18	0	0	0	0	0	0	18
4913	0	0	0	0	0	5	0	5
4951	15	0	0	0	0	0	0	15
4962	5	0	0	0	0	0	0	5
4996	11	0	0	18	0	0	0	29
5017	4	0	2	0	29	0	0	35
5027	0	0	0	0	0	0	11	11
5035	0	0	0	0	35	0	0	35
5043	0	0	0	0	0	0	9	9
5053	6	0	0	0	36	0	0	42
5067	53	0	0	0	0	0	0	53
5078	0	0	2	0	0	0	0	2
5086	18	7	0	0	0	4	0	29
5095	0	0	0	6	0	0	0	6
5108	45	0	0	0	0	0	0	45
5127	15	4	0	0	0	0	0	19
5135	11	0	0	0	0	0	0	11
5165	0	20	0	0	0	0	0	20
5187	15	0	0	0	0	0	0	15
5195	0	0	2	0	0	6	0	8
5215	7	0	0	0	0	0	0	7
5236	21	0	0	0	27	0	0	48
5255	0	0	0	0	0	0	12	12
5275	28	0	0	0	0	0	0	28
5285	0	0	0	0	0	5	0	5
5296	0	0	0	0	35	0	0	35
5314	22	0	0	0	0	0	0	22
5328	50	0	0	0	0	0	0	50
5336	1	0	2	0	24	0	0	27
5347	0	0	0	0	0	1	26	27
5355	31	0	0	0	0	0	0	31
5368	1	0	0	0	0	11	0	12
5386	14	0	0	0	0	0	0	14
5414	47	0	2	0	0	0	0	49
5428	25	0	0	0	0	0	0	25
5654	0	0	0	0	0	3	0	3
5711	0	0	0	0	0	2	0	2
5801	12	8	0	0	0	0	0	20
5822	27	0	0	0	0	0	0	27
5862	6	2	0	0	24	0	0	32
6222	0	0	0	0	22	0	0	22
6347	19	0	0	0	0	0	0	19
6387	0	0	0	0	0	0	13	13
6406	11	0	0	0	0	0	0	11
6686	18	5	0	0	0	0	0	23
6727	12	0	0	0	0	0	0	12
7237	17	3	0	0	0	0	0	20
7359	13	8	0	0	0	0	0	21
7817	0	0	0	0	0	6	0	6

Total 2224
Loc

Appendix 2. Number and percent of locations in the Lower Klamath /Tule Lake National wildlife complex by Unit.

Refuge	Unit	Number of Locations	Percent	
Lower Klamath	10	37	5.76	
	11a1	10	1.56	
	11a2	68	10.59	
	11b	11	1.71	
	11c	50	7.79	
	12a	6	0.93	
	12c	28	4.36	
	13a	95	14.80	
	13b	37	5.76	
	1-6	1	0.16	
	1-8	1	0.16	
	1-9	1	0.16	
	2	16	2.49	
	3a	2	0.31	
	4a	36	5.61	
	4b	8	1.25	
	4e	3	0.47	
	4f	4	0.62	
	4g	9	1.40	
	5a	3	0.47	
	5b	16	2.49	
	6a	32	4.98	
	6b1	2	0.31	
	6b2	39	6.07	
	6c	4	0.62	
	7a	1	0.16	
	7b	2	0.31	
	8	7	1.09	
	9a	3	0.47	
	9b	3	0.47	
	9c	2	0.31	
	Badorek	1	0.16	
	Miller Lake	2	0.31	
		OF1	26	4.05
		OF2	10	1.56
		OF3	2	0.31
	Okeeffe	2	0.31	
	Other	29	4.52	
		SF1	3	0.47
		SF2	1	0.16
	SF3	1	0.16	
	SF4	1	0.16	

	SF5	1	0.16
	SF6	2	0.31
	Sheepy east 6d	4	0.62
	Sheepy east 6e	1	0.16
	Sheepy east 7a	1	0.16
	Sheepy east 7b	4	0.62
	Sheepy east 7c	1	0.16
	Sheepy east 7d	2	0.31
	Sheepy west	10	1.56
	White Lake	1	0.16
Tule Lake	Disco Marsh	5	3.14
	English Channel	1	0.63
	Frys Island	11	6.92
	Hovey Point	5	3.14
	Lost river	3	1.89
	Other	2	1.26
	Sump 1b	92	57.86
	Sump 2	3	1.89
	Sump 3	18	11.32
	Tule Lake	12	7.55
	Tulelake Marsh	7	4.40

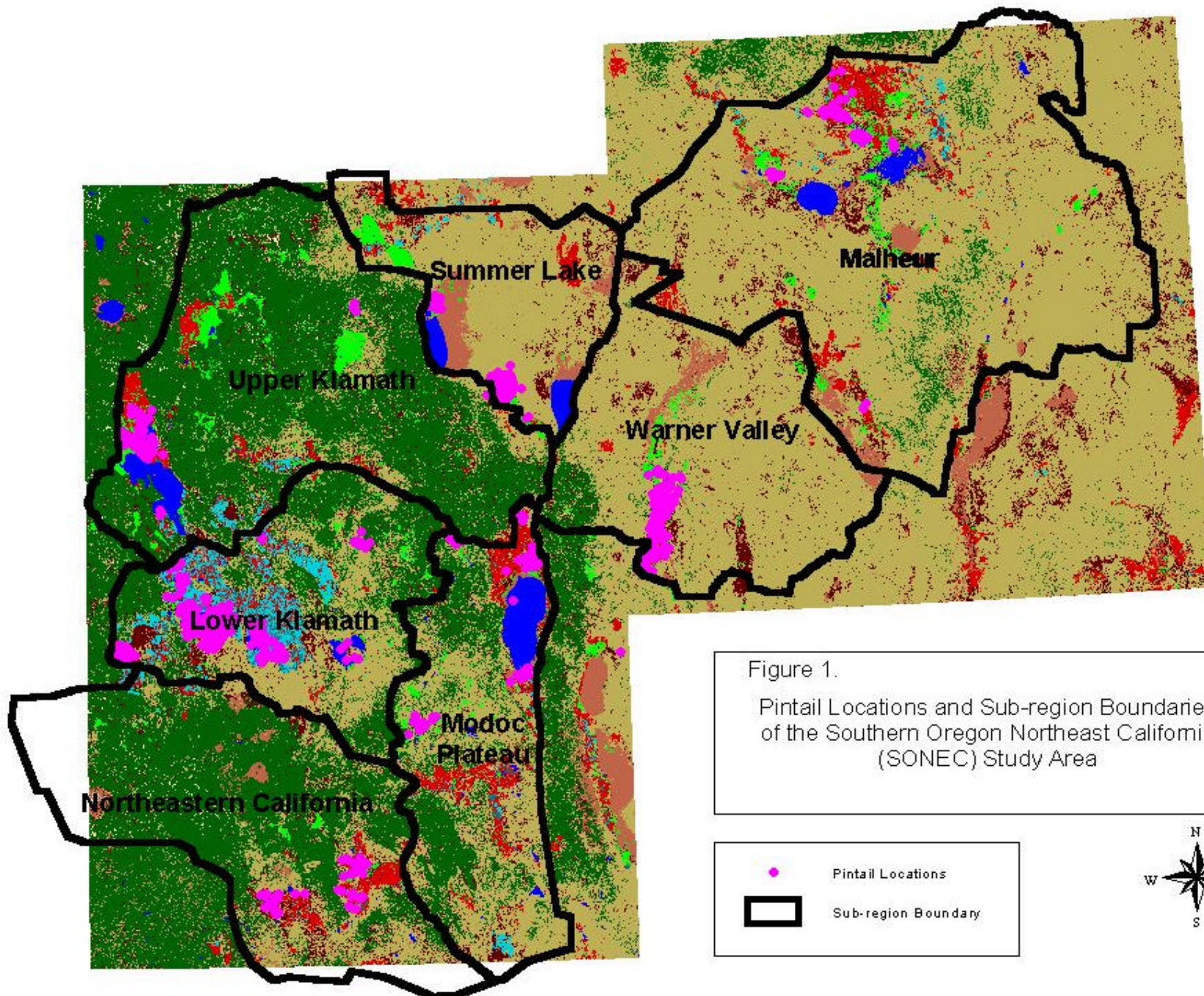
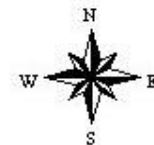


Figure 1.

Pintail Locations and Sub-region Boundaries
of the Southern Oregon Northeast California
(SONEC) Study Area

● Pintail Locations
▭ Sub-region Boundary



**Figure 2. WATERFOWL ABUNDANCE
IN
SOUTHERN OREGON-NE CALIFORNIA
DURING SPRING 2002**

