

**2002 BREEDING BIRD SURVEYS AT THE IDAHO NATIONAL  
ENGINEERING AND ENVIRONMENTAL LABORATORY**



Prepared for:  
S.M. Stoller Corporation  
1780 First Street  
Idaho Falls, Idaho 83401

By:  
Ethan A. Ellsworth  
Department of Biology  
University of Idaho  
Moscow, Idaho

## Executive Summary

From 10-23 June 2002, 13 permanent survey routes located at the Idaho National Engineering and Environmental Laboratory (INEEL) were censused for birds. A 14th route established in 1997, IRR Circle, was surveyed on June 15, 2002. A total of 5,808 individuals representing 60 species of birds was recorded along the 13 permanent routes. This is above the average of 4,590.4 birds/year recorded from 1985-2001, and the highest total recorded since 1998. However, high numbers of birds counted on the site were buoyed considerably by a record number of two species: Franklin's Gull and Horned Lark. These two species comprised 34.2% of all birds counted, and most of the 764 Franklin's Gulls were observed off-site on a nearby alfalfa field. Counts of Horned Larks have increased in recent years, most likely as a result of large fires in recent years and the conversion of sagebrush habitat to grasslands. Species of special concern recorded in 2002 included Long-billed Curlew (N = 1), Ferruginous Hawk (N = 14), Swainson's Hawk (N = 2), and Loggerhead Shrike (N = 22). As in recent years (1996-2001), none of the species observed in 2002 were 2.5 or more standard deviations below long-term (1985 – 2001) average abundance, although several species recorded in previous years were not observed in 2002.

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## Introduction



The Breeding Bird Survey (BBS) is a roadside route survey of avifauna designed to monitor abundance and distribution of birds in the United States and southern Canada. It began in the eastern U.S. in 1966 but is now nationwide in scope, with approximately 3700 annual survey routes (see United States Geological Survey (USGS) BBS data; web site: [www.mbr-pwrc.gov/bbs/bbs.html](http://www.mbr-pwrc.gov/bbs/bbs.html)). Data from these censuses are one of the main sources of information on avian population trends across the continent. Because methods are standardized, comparisons across years and regions of the country are possible, and a variety of local or regional assessments have been conducted (e.g., Geissler and Noon 1981, Holmes and Sherry 1988, Sauer and Droege 1990, Sauer et al. 2000).

BBS surveys have helped document population changes in the avifauna of the eastern U.S. (e.g., Sauer and Droege 1990, Askins et al. 1990, Finch and Stangel 1992, Hagan and Johnston 1992), but patterns of population change in western states have remained understudied in comparison. Insufficient route coverage over much of the western U.S. has limited attempts to compare trends in BBS data for populations of many western species (Sauer and Droege 1992). For comparison, Idaho has 62 BBS routes, while New York has 120, Minnesota 88, and Florida 136 routes (USGS BBS data). Moreover, BBS routes in shrubsteppe and grassland habitats are uncommon, despite apparent widespread declines in avifauna (Paige 1990, Sauer et al. 2000). In Idaho, approximately 20 BBS routes are surveyed in shrubsteppe and grassland habitat in southern Idaho, including 12 in southeastern Idaho.

The Idaho National Engineering and Environmental Laboratory (INEEL), located in southeastern Idaho, is comprised of large expanses of relatively undisturbed shrubsteppe and grassland habitat. This area was designated as a National Environmental Research Park in 1975 and serves as an outdoor laboratory to assess environmental impacts of nuclear energy development technologies. Since 1985, official BBS and modified “mini-routes” have been surveyed at the INEEL. These surveys have yielded useful information about population dynamics, effects of weather and fire on avian abundance, effects of INEEL facilities on avifauna, and the breeding status of a number of bird species of concern, including sagebrush obligate species and other species exhibiting declines throughout their range (e.g., see Belthoff and Ellsworth 1996, 1999 and 2000, Belthoff et al. 1998, and Ellsworth 2001).

This report summarizes results of 2002 surveys at the INEEL and briefly compares findings to those from previous years. Common names for bird species are used throughout the report but scientific names are given in Figure 1.

### **Study Area**

The 2,315 km<sup>2</sup> INEEL is located approximately 48 km west of Idaho Falls on the upper Snake River Plain in southeastern Idaho, and occupies portions of Bingham, Bonneville, Butte, Clark, and Jefferson counties. The area is a semiarid, cold desert with an average elevation of approximately 1500 m above sea level. Anderson et al. (1996) detailed the climate, geology, and vegetation of the INEEL. Briefly, vegetation in the study area is typical of shrubsteppe ecosystems and is dominated by woody, mid-height shrubs and perennial bunchgrasses. Big Sagebrush (*Artemisia tridentata*) dominates much of the vegetation on the site, but other principle shrubs include Green Rabbitbrush (*Chrysothamnus viscidiflorus*), Shadscale (*Atriplex confertifolia*), and Winterfat (*Krascheninnikovia lanata*).

Large tracts of grasslands are dominated by Squirreltail (*Elymus elymoides*), Thickspike Wheatgrass (*Elymus lanceolatus*), Needle and Thread Grass (*Hesperostipa comata*), Ricegrass (*Achnatherum hymenoides*), and Bluebunch Wheatgrass (*Agropyron spicatum*). Basalt lava flows dominate the geology of the region, and the topography is flat to gently rolling, with the exception of East and Middle Butte, which protrude from the southern portion of the area. Southern extensions of two of the largest mountain ranges in Idaho (Lost River and Lemhi Mountains) rise above the INEEL site and Snake River Plain to the north and west. The study area experiences hot, dry summers and cold winters (Short 1986). Annual precipitation averages approximately 20 cm, and most of this occurs during the spring and winter. Surface water in the summer is limited to residual flows of the Big Lost River and Birch Creek, each of which are diverted upstream of the site for agriculture and flood prevention. During the spring, the Big Lost River flows into an ephemeral wetland known as the Lost River Sinks, which can provide nesting and migratory stop-over habitat for waterfowl and shorebirds. Several human-made waste-water treatment ponds occur near research facilities and attract birds that prefer aquatic habitats as well.

### **Methods**

From 10-23 June 2002, 13 permanent routes and one recently established route were surveyed for birds. These included five 40-km remote routes that traverse the major habitat types throughout remote areas of the site. These were standard BBS routes, from which data are reported to the U.S.G.S., Biological Resources Division annually. Standard BBS protocol (Robbins et al. 1986) was followed in completing each of these surveys. Briefly, I drove routes in a four-wheel drive vehicle and recorded the number of individuals of each bird species detected during 3-min observation sessions at each stop. Surveys began

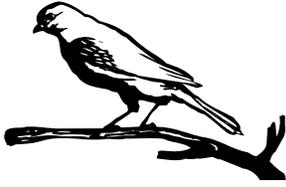
approximately 30 minutes before sunrise. Stops were located every 0.8 km (0.5 miles), and I counted birds within a 0.4 km radius. Eight shorter facility complex routes, located in and around major INEEL facility complexes, ranged from 5.8 - 19.2 km in length. Surveys along the shorter facility complex routes were similar to remote routes, except that stops were closer together (0.32 km) and I counted birds within a 0.15-km radius. An additional survey route (IRR Circle; containing six stops 0.32 km apart) was established in 1997 around the irrigation circle, located near the Central Facilities Area (CFA). This area is part of an experiment designed to monitor how waste-water management affects flora and fauna. I recorded temperature, wind speed, and cloud cover at the start and end of each survey. Surveys are to be performed only when weather conditions were satisfactory as prescribed by the BBS protocol, and in 2002 no surveys were postponed because of inclement weather. Routes took from approximately 50 min to 6 h to complete.

The five remote routes were surveyed on the following dates in 2002: Twin Buttes -10 June, Kyle Canyon - 12 June, Big Lost River - 19 June, Circular Butte – 20, June Tractor Flats -21 June.

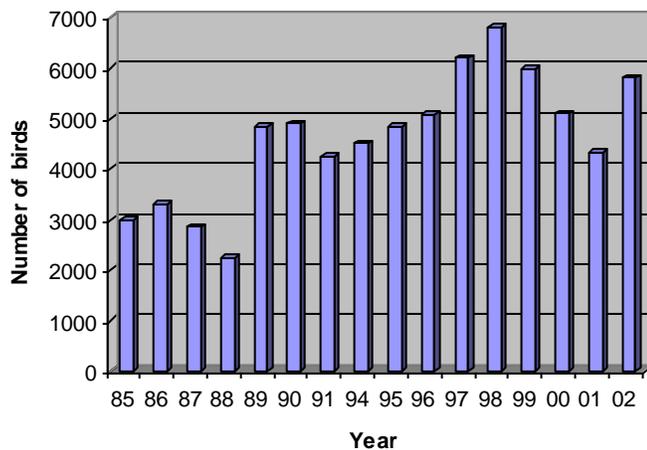
Facility Complex routes were surveyed on the following dates in 2002: ICPP - 11 June, RWMC - 14 June, CFA - 15 June, TAN - 16 June, PBF- SPERT – 17 June, NRF - 18 June, EBRII - 22 June, TRA - 23 June. The newly established route, IRR Circle, was surveyed using facility route protocol on after completion of the CFA route; therefore, the survey did not begin one-half hour before sunrise as other routes had. Results for IRR Circle are in Appendix A but are not summarized here because of differences in survey protocol and lack of data from previous years for comparison. Means and standard deviations are presented throughout this report.

## Results and Discussion

### Bird abundance and species richness



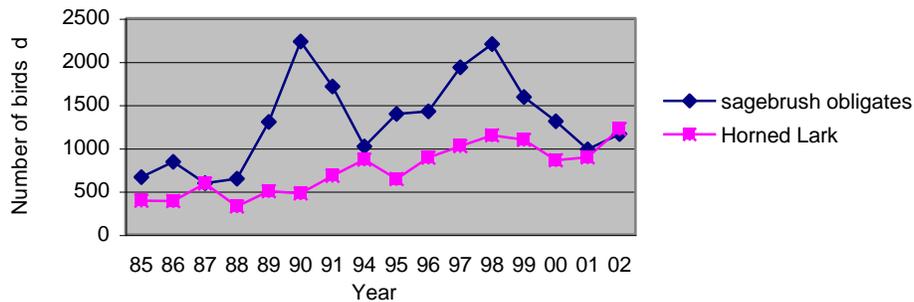
*Abundance*— A total of 5,808 individual birds was recorded along the 13 survey routes (Table 1). This is the fourth highest total recorded (see Figure 1) and well above the 1985-2001 average of 4,590.4 birds/year (no surveys were conducted in 1992 or 1993). The total number of birds counted during surveys is now 74,390 and the average per year is 4,649.4 (1985-2002).



**Figure 1.** Total number of birds recorded by year (1985-2002) along 13 permanent routes at the INEEL.

2002 marked a reversal in a 3-year downward trend in the number of birds counted at the site. This is notable, in part, because the spring of 2002 was dry and fewer birds are usually counted when there is little spring moisture, and the highest numbers of birds are typically counted in years with greater spring moisture (Belthoff & Ellsworth 2000). The high numbers of birds counted in 2002, however, does not necessarily reflect large numbers of birds counted among all taxa. Several species were at or below long-term averages and the

relative abundance of a number of birds species continued to decline in the last 3 years. Instead, the total count was inflated by record numbers of Horned Lark and Franklin’s Gull. In fact, most of the Franklin’s Gulls were counted adjacent to INEEL property in an alfalfa field that was recently mowed. Franklin’s Gulls typically forage on large bodied insects and congregate on the INEEL in years of large cicada hatches in sagebrush areas. However, no observations of gulls foraging at the site were made in 2002 during BBS surveys, although a few were seen flying overhead. The record number of Horned Lark also buoyed the grand totals, as their total was 34% above average (see Figure 2). The recent increase is not surprising as Horned Lark are a dominant component of grasslands on the INEEL, and fires in recent years (particularly 2000) have converted large areas of sagebrush to grasslands. Likely, Horned Lark will continue to dominate the avifauna of the INEEL, and other species that nest in grasslands and low shrubs should increase in number as well (i.e., Grasshopper



**Figure 2.** Total number of sagebrush obligates (Brewer’s Sparrows, Sage Sparrows and Sage Thrashers) and Horned Larks recorded by year at the INEEL from 1985-2002.

Sparrow and Vesper Sparrow). At the same time, however, fire has reduced sagebrush habitat on the INEEL, which is the primary nesting and foraging habitat for many bird

species, including the sagebrush obligates (Brewer's Sparrow, Sage Sparrow, Sage Thrasher). Indeed, a recent downward trend in the number of sagebrush obligate species counted (Figure 2) is consistent with the notion that sagebrush habitat is being lost and may be negatively effecting these populations of birds. Although large expanses of sagebrush habitat remain of the INEEL and fire is a natural part of the ecosystem of the Snake River Plain, concern for the preservation of sagebrush habitat is valid given that much of this habitat in the region has been lost and converted to agriculture or development. At the very least, further sagebrush habitat loss should continue to be monitored.

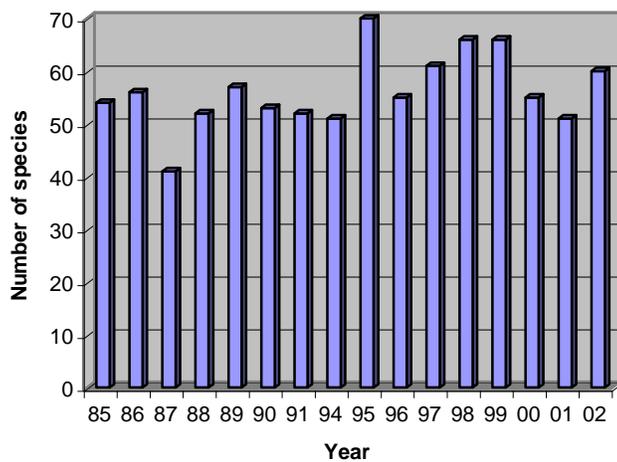
Waterfowl counts at the INEEL were also low in 2002, which is characteristic of dry springs when the Lost River and associated sinks are dried up by the time surveys are performed in June. The general pattern is that when the Lost River and sinks hold water into June, waterfowl is abundant and high numbers of waterfowl are counted. Conversely, few waterfowl are counted in low moisture years; in 2002 no waterfowl were observed on the Lost River and the only waterfowl observed were at the facility wastewater treatment areas.

Several species observed in six or more previous years were absent in 2002, including Burrowing Owl, Mountain Bluebird, Lark Bunting, Lazuli Bunting, House Sparrows, Prairie Falcon, Golden Eagle, and Willet.

Overall, there were  $446.8 \pm 142.3$  ( $N = 13$ ) birds per route. The average number of birds per route was greater for remote routes ( $727.0 \pm 112.7$ ,  $N = 5$ ) than for facility complex routes ( $271.6.0 \pm 82.1$ ,  $N = 5$ ), and the average number of birds per stop was greater for remote routes ( $14.5 \pm 7.8$ ) than for facility routes ( $8.9 \pm 1.3$ ; Table 2). Appendix A contains a list of species observed and their relative abundance along the 13 survey routes and the IRR Circle.

Overall, the five most numerous species in order of abundance were Horned Larks, Western Meadowlarks, Franklin’s Gulls, Brewer's Sparrows, and Sage Thrashers. The inclusion of Franklin’s Gulls in this group is unusual, as they are not typically one of the most common species and are absent in most years on the INEEL (see Ellsworth 2001). In most years the other four species plus Sage Sparrows are the most frequently counted species, and comprise 71.3% of all birds detected from 1985-2001.

*Species Richness* - In 2002, the total of 60 species detected during surveys was above the average of  $55.5 \pm 7.5$  recorded from 1985-2001 (Figure 3). One new species for the BBS surveys, the Black-necked Stilt, was observed at an Argonne facility pond, and the total number of species detected along the routes (1985-2002) is 113. In 2002, there were  $19.7 \pm 2.1$  species per route, and nearly the same number of species were recorded along remote routes ( $19.6 \pm 3.0$ ) as facility routes ( $19.8 \pm 2.2$ ). The fewest number of species ( $N = 15$ ) were observed along the Circular Butte and Lost River routes, while the NRF route had the greatest number of species ( $N = 25$ ).



**Figure 3.** Total number of species recorded by year (1985-2002) along 13 permanent survey routes at the Idaho National Engineering and Environmental Laboratory.

## Habitat and species assemblages

A limited assemblage of breeding bird species that are typical of sagebrush steppe or grassland communities within the Snake River Plain dominate the avifauna of the INEEL. These species include native species such as the ubiquitous Western Meadowlark, Mourning Dove, Brown-headed Cowbird, Common Nighthawk, Common Raven, the sagebrush obligates, Rock Wrens within rocky outcrops, and Horned Larks and Vesper Sparrows in the grasslands. Other less common, but widespread species include the Common Poorwill, Loggerhead Shrike, Grasshopper Sparrow, Lark Sparrow, Short-eared Owl, Burrowing Owl, Great-horned Owl, Ferruginous Hawk, Red-tailed Hawk, Swainson's Hawk, Prairie Falcon, and Golden Eagle. There also exist, however, several other bird species that are not usually found in the sage or grasslands and are principally relegated to a variety of other distinct habitat types. For example, there are species of birds that are found on the INEEL only in junipers in patches near the buttes or along the base of the Lemhi and Lost River Mountains. These species, including Chipping Sparrow, Blue-gray Gnatcatcher, and Gray Flycatcher, are counted at the same sites every year and nowhere else. Waterfowl and shorebirds are another group of birds that has limited distribution on the INEEL, either in natural areas along the Lost River (when it contains water) or in man-made ponds near the facilities.

An additional array of bird species that are not found in the natural habitats of the INEEL are attracted to the facilities where there is permanent water, different food resources, and buildings and planted trees for nest sites. These species include House Finch, Barn Swallow, American Robin, and Bullock's Oriole. Most of these species are native to well-watered areas within the Snake River Plain and/or surrounding mountains, but the facilities also provide habitat for non-natives such as the Rock Dove, House Sparrow, and European

Starling. Finally, there are such birds, such as the Brewer's Blackbird, Black-billed Magpie, and Say's Phoebe that can be found near the facilities and in natural areas.

#### Species of special concern

Species of special concern observed during the 2002 census included Long-billed Curlew (N = 1), Ferruginous Hawk (N = 14), Swainson's Hawk (N = 2), and Loggerhead Shrike (N = 22; Table 1). The INEEL continues to support species of birds that are low or declining in number throughout the Intermountain West.

#### **Summary**

A relatively high number of birds were counted along the BBS routes at the INEEL in 2002. However, record numbers of Horned Lark and Franklin's Gull were observed, boosting the overall total of birds considerably. Franklin's Gulls were one of the five most abundance species on the INEEL for the first time since 1989, but were mainly observed off-site. Widespread and increasing populations of Horned Larks is not surprising in lieu of recent fires that have converted extensive areas from sagebrush to the grasslands that Horned Larks use. Most other bird species populations were comparable in number to recent years including sagebrush obligates and species of special concern. The average number of birds per route was greater for remote routes than for facility complex routes.

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Table 1. Birds observed along 13 Breeding Bird Survey routes at the Idaho National Engineering and Environmental Laboratory during the 2000, 2001, and 2002 census. Population trends over the three-year period are indicated for each species by positive or negative symbols or a zero if there was no trend.

Common Name	Scientific Name	2002	2001	2000	3-year trend
Horned Lark	<i>Eremophila alpestris</i>	<b>1222</b>	892	859	+
Western Meadowlark	<i>Sturnella neglecta</i>	<b>799</b>	773	844	o
Franklin's Gull	<i>Larus pipixcan</i>	<b>764</b>	43	0	+
Brewer's Sparrow	<i>Spizella breweri</i>	<b>674</b>	579	709	o
Sage Thrasher	<i>Oreoscoptes montanus</i>	<b>486</b>	414	497	o
Sage Sparrow	<i>Amphispiza belli</i>	<b>396</b>	404	601	-
Brown-headed Cowbird	<i>Molothrus ater</i>	<b>233</b>	205	318	o
Mourning Dove	<i>Zenaida macroura</i>	<b>211</b>	130	280	o
Vesper Sparrow	<i>Pooecetes gramineus</i>	<b>198</b>	196	234	o
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	<b>166</b>	147	132	+
European Starling	<i>Sturnus vulgaris</i>	<b>60</b>	35	36	o
Common Nighthawk	<i>Chordeiles minor</i>	<b>57</b>	70	69	o
House Finch	<i>Carpodacus mexicanus</i>	<b>56</b>	57	78	-
Killdeer	<i>Charadrius vociferus</i>	<b>55</b>	33	33	+
Barn Swallow	<i>Hirundo rustica</i>	<b>43</b>	45	52	-
Common Raven	<i>Corvus corax</i>	<b>38</b>	27	53	o
Wilson's Phalarope	<i>Phalaropus tricolor</i>	<b>36</b>	8	9	+
Rock Wren	<i>Salpinctes obsoletus</i>	<b>32</b>	26	22	+

American Robin	<i>Turdus migratorius</i>	<b>30</b>	27	6	+
Gray Flycatcher	<i>Empidonax wrightii</i>	<b>23</b>	21	14	+
Loggerhead Shrike	<i>Lanius ludovicianus</i>	<b>22</b>	15	24	o
Ferruginous Hawk	<i>Buteo regalis</i>	<b>14</b>	12	9	+
California Gull	<i>Larus californicus</i>	<b>14</b>	2	1	+
Bank Swallow	<i>Riparia riparia</i>	<b>13</b>	11	13	o
Chipping Sparrow	<i>Spizella passerina</i>	<b>13</b>	26	11	o
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	<b>13</b>	7	7	+
Black-billed Magpie	<i>Pica pica</i>	<b>11</b>	4	13	o
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	<b>11</b>	9	6	+
Spotted Sandpiper	<i>Actitis macularia</i>	<b>11</b>	4	1	+
Say's Phoebe	<i>Sayornis saya</i>	<b>9</b>	15	18	-
Cliff Swallow	<i>Hirundo pyrrhonotoa</i>	<b>8</b>	0	2	o
Blue-winged Teal	<i>Anas discors</i>	<b>8</b>	0	0	+
Northern Harrier	<i>Circus cyaneus</i>	<b>8</b>	6	13	o
Mallard	<i>Anas platyrhynchos</i>	<b>7</b>	11	13	-
Sage Grouse	<i>Centrocercus urophasianus</i>	<b>7</b>	0	9	o
American Crow	<i>Corvus brachyrhynchos</i>	<b>6</b>	1	3	o
Red-tailed Hawk	<i>Buteo jamaicensis</i>	<b>6</b>	6	10	-
Rock Dove	<i>Columba livia</i>	<b>6</b>	6	7	-
Gadwall	<i>Anas strepera</i>	<b>6</b>	2	2	+
Cinnamon Teal	<i>Anas cyanoptera</i>	<b>4</b>	2	0	+

American Kestrel	<i>Falco sparverius</i>	3	9	12	-
Western Kingbird	<i>Tyrannus verticalis</i>	3	8	0	o
Shoveler	<i>Anas clypeata</i>	2	0	2	o
Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>	2	4	6	-
Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	2	0	5	o
Swainson's Hawk	<i>Buteo swainsoni</i>	2	3	2	o
American Avocet	<i>Recurvirostra americana</i>	2	0	7	o
Canada Goose	<i>Branta canadensis</i>	2	0	0	+
Green-tailed Towhee	<i>Pipilo chlorurus</i>	2	1	0	+
Yellow-headed Blackbird	<i>Xanthocephalus xanthocephalus</i>	2	0	0	+
Short-eared Owl	<i>Asio flammeus</i>	1	1	0	o
Long-billed Curlew	<i>Numenius americanus</i>	1	2	6	-
Western Tanager	<i>Piranga ludoviciana</i>	1	0	0	+
Northern Flicker	<i>Colaptes auratus</i>	1	0	9	o
Bullock's Oriole	<i>Icterus galbula</i>	1	2	0	o
Redhead	<i>Aythya valisineria</i>	1	0	0	+
Ruddy Duck	<i>Oxyura jamaicensis</i>	1	0	0	+
Black-necked Stilt	<i>Himantopus mexicanus</i>	1	0	0	+
Lark Sparrow	<i>Chondestes grammacus</i>	1	8	4	o
Violet-green Swallow	<i>Tachycineta thalassina</i>	1	0	3	o
Common Poorwill	<i>Phalaenoptilus nuttallii</i>	0	4	0	o
Prairie Falcon	<i>Falco mexicanus</i>	0	2	1	o

House Sparrow	<i>Passer domesticus</i>	0	1	5	-
Eastern Kingbird	<i>Tyrannus tyrannus</i>	0	1	0	o
Lark Bunting	<i>Calamospiza melanocorys</i>	0	0	9	-
Savannah Sparrow	<i>Passerculus sandwichensis</i>	0	0	5	-
Gray Partridge	<i>Perdix perdix</i>	0	0	4	-
Burrowing Owl	<i>Athene cunicularia</i>	0	0	1	-
Ring-necked Pheasant	<i>Phasianus colchicus</i>	0	0	1	-
Mountain Bluebird	<i>Sialia currucoides</i>	0	0	1	-

**2002 TOTAL:**                      **5,808 individuals**  
   **60 species**

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Table 2. Number of species, number of individual birds, and average number of individuals per stop along Remote Routes (N = 5) and Facility Complex Routes (N = 8) at the INEEL in 2002.

Route	Stops	Species	N	Birds/Stop
<i>Remote Routes</i>				
Circular Butte (Monument)	50	15	529	10.6
Kyle Canyon	50	22	458	9.2
Lost River	50	19	484	9.7
Tractor Flats	50	23	1637	32.7
Twin Buttes	50	19	527	10.5
<b>Subtotal</b>	<b>250</b>	<b>39</b>	<b>3635</b>	<b>14.5</b>
<i>Facility Complex Routes</i>				
CFA	42	19	334	7.9
EBRII	18	23	213	11.8
ICPP/INTEC	25	17	220	8.8
NRF	20	25	230	11.5
PBF-SPERT	28	16	284	10.1
RWMC	20	21	161	8.1
TAN	60	18	465	7.8
TRA	32	19	266	8.3
<b>Subtotal</b>	<b>245</b>	<b>37</b>	<b>2173</b>	<b>8.9</b>
<b>TOTAL</b>	<b>495</b>	<b>60</b>	<b>5,808</b>	<b>11.7</b>



**Appendix A**  
**Summary of Species by Route**  
**(2002)**

Survey Route: TWIN BUTTES  
Survey Date: 10 June 2002

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Species	Abundance	Percentage
Horned Lark	134	30.4
Western Meadowlark	128	29.3
Brewer's Sparrow	72	16.1
Sage Thrasher	55	12.1
Sage Sparrow	49	10.9
Brown-headed Cowbird	36	7.9
Mourning Dove	20	4.4
Vesper Sparrow	5	1.1
Gray Flycatcher	5	1.1
Common Raven	5	1.1
Common Nighthawk	4	0.9
Loggerhead Shrike	4	0.9
American Robin	3	0.6
Green-tailed Towhee	2	0.4
Lark Sparrow	1	0.2
Western Tanager	1	0.2
Northern Flicker	1	0.2
Red-tailed Hawk	1	0.2
Ferruginous Hawk	1	0.2

Total Individuals = 452

Total Species = 19

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Survey Route: BIG LOST RIVER  
Survey Date: 19 June 2002

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Species	Abundance	Percentage
Horned Lark	245	50.6
Western Meadowlark	64	13.2
Brewer's Sparrow	42	8.7
Sage Sparrow	33	6.8
Sage Thrasher	25	5.2
Brewer's Blackbird	14	2.9
Mourning Dove	13	2.7
Vesper Sparrow	12	2.5
Brown-headed Cowbird	10	2.1
Sage Grouse	6	1.2
Rock Wren	5	1.0
Common Raven	4	0.8
Common Nighthawk	2	0.4
Loggerhead Shrike	2	0.2
Red-tailed Hawk	2	0.2
Ferruginous Hawk	2	0.2
American Robin	1	0.1
Bullock's Oriole	1	0.1
Say's Phoebe	1	0.1

Total Individuals = 484  
Total Species = 19

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Survey Route: KYLE CANYON  
Survey Date: 12 June 2002

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Species	Abundance	Percentage
Horned Lark	101	21.9
Brewer's Sparrow	72	15.6
Western Meadowlark	58	12.6
Sage Sparrow	52	11.2
Sage Thrasher	43	9.3
Vesper Sparrow	39	8.4
Mourning Dove	18	3.9
Gray Flycatcher	18	3.9
Chipping Sparrow	13	2.8
Ferruginous Hawk	10	2.2
Loggerhead Shrike	7	1.5
Brown-headed Cowbird	5	1.1
American Robin	5	1.1
Common Raven	3	0.7
Lark Sparrow	3	0.7
Black-billed Magpie	3	0.7
Blue-gray Gnatcatcher	2	0.4
Red-tailed Hawk	2	0.4
Rough-winged Swallow	2	0.4
Brewer's Blackbird	2	0.4
Rock Wren	1	0.2
Long-billed Curlew	1	0.2
Common Nighthawk	1	0.2
Canada Goose	1	0.2

Total Individuals = 462

Total Species = 24

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Survey Route: CIRCULAR BUTTE  
Survey Date: 20 June 2002

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Species	Abundance	Percentage
Horned Lark	155	29.0
Western Meadowlark	117	21.9
Brewer's Sparrow	86	16.1
Sage Sparrow	50	9.4
Sage Thrasher	43	8.1
Brown-headed Cowbird	31	5.8
Vesper Sparrow	12	2.2
Mourning Dove	11	2.1
Rock Wren	10	1.9
Common Raven	5	1.0
Franklin's Gull	3	0.6
Loggerhead Shrike	2	0.4
Brewer's Blackbird	2	0.4
Sage Grouse	1	0.2
Common Nighthawk	1	0.2

Total Individuals = 534

Total Species = 15

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Survey Route: TRACTOR FLATS  
Survey Date: 21 June 2002

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Species	Abundance	Percentage
Franklin's Gull	761	46.4
Horned Lark	224	13.7
Western Meadowlark	142	8.7
Brewer's Sparrow	125	7.6
Sage Thrasher	85	5.2
Mourning Dove	78	4.8
Sage Sparrow	50	3.1
Brown-headed Cowbird	49	3.0
Vesper Sparrow	48	2.9
Common Nighthawk	17	1.0
California Gull	14	0.9
Black-billed Magpie	8	0.5
Common Raven	7	0.4
Northern Harrier	7	0.4
American Crow	6	0.4
European Starling	5	0.3
Loggerhead Shrike	3	0.2
Swainson's Hawk	2	0.1
Grasshopper Sparrow	2	0.1
Short-eared Owl	1	<0.1
Ferruginous Hawk	1	<0.1
Red-tailed Hawk	1	<0.1
American Kestrel	1	<0.1

Total Individuals = 1637

Total Species = 23

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Survey Route: ICPP  
Survey Date: 11 June 2002

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Species	Abundance	Percentage
Brewer's Sparrow	56	25.5
Horned Lark	45	20.5
Sage Thrasher	41	18.4
Western Meadowlark	26	11.8
Sage Sparrow	20	9.1
Brown-headed Cowbird	5	2.3
European Starling	5	2.3
House Finch	4	1.8
Brewer's Blackbird	4	1.8
Rock Wren	4	1.8
Common Nighthawk	2	0.9
Mourning Dove	2	0.9
Killdeer	2	0.9
Vesper Sparrow	1	0.5
Common Raven	1	0.5
Loggerhead Shrike	1	0.5
Violet-green Swallow	1	0.5
Total Individuals = 220		
Total Species = 17		

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Survey Route: CFA  
Survey Date: 15 June 2002

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Species	Abundance	Percentage
Western Meadowlark	58	17.3
Brewer's Sparrow	40	11.9
Sage Sparrow	37	11.0
Sage Thrasher	36	10.7
Horned Lark	26	7.8
Brown-headed Cowbird	24	7.2
Brewer's Blackbird	23	6.9
American Robin	16	4.8
Killdeer	16	4.9
Barn Swallow	11	3.3
House Finch	10	3.0
European Starling	10	3.0
Common Nighthawk	9	2.7
Mourning Dove	8	2.4
Say's Phoebe	3	0.9
Common Raven	2	0.6
American Kestrel	2	0.6
Grasshopper Sparrow	2	0.6
Western Kingbird	1	0.3

Total Individuals = 335  
Total Species = 19

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Survey Route: TRA  
Survey Date: 23 June 2002

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Species	Abundance	Percentage
Horned Lark	51	19.2
Brewer's Blackbird	48	18.0
Western Meadowlark	46	17.3
Sage Thrasher	24	9.0
European Starling	15	5.6
Brewer's Sparrow	12	4.5
Brown-headed Cowbird	11	4.1
Sage Sparrow	11	4.1
Mourning Dove	11	4.1
Vesper Sparrow	10	3.8
Killdeer	6	2.3
American Robin	4	1.5
House Finch	4	1.5
Red-winged Blackbird	3	1.1
Barn Swallow	3	1.1
Common Raven	3	1.1
Common Nighthawk	2	0.8
Rock Wren	1	0.4
Mallard	1	0.4

Total Individuals = 266  
Total Species = 19

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Survey Route: EBRII  
Survey Date: 22 June 2002

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Species	Abundance	Percentage
Western Meadowlark	31	14.5
Horned Lark	25	11.7
Brewer's Sparrow	18	8.5
Sage Thrasher	18	8.5
Wilson's Phalarope	15	7.0
Killdeer	14	6.6
Sage Sparrow	13	6.1
Brewer's Blackbird	13	6.1
Barn Swallow	10	4.7
Mourning Dove	8	3.8
Brown-headed Cowbird	8	3.8
Common Nighthawk	8	3.8
European Starling	8	3.8
House Finch	7	3.3
Spotted Sandpiper	4	1.9
Cinnamon Teal	3	1.4
Western Kingbird	2	0.9
American Avocet	2	0.9
Rock Wren	2	0.9
Black-necked Stilt	1	0.5
Shoveler	1	0.5
Ruddy Duck	1	0.5
American Robin	1	0.5

Total Individuals = 213  
Total Species = 23

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Survey Route: NRF  
Survey Date: 18 June 2002

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Species	Abundance	Percentage
Horned Lark	59	25.7
Western Meadowlark	36	15.7
Brewer's Sparrow	18	7.8
Sage Sparrow	14	6.1
Brown-headed Cowbird	13	5.7
Brewer's Blackbird	9	3.9
Wilson's Phalarope	9	3.9
Mourning Dove	9	3.9
Killdeer	9	3.9
Sage Thrasher	8	3.5
House Finch	7	3.0
Blue-winged Teal	7	3.0
Barn Swallow	6	2.6
European Starling	5	2.2
Red-winged Blackbird	4	1.7
Spotted Sandpiper	4	1.7
Common Nighthawk	3	1.3
Rock Wren	2	0.9
Vesper Sparrow	2	0.9
Cinnamon Teal	1	0.4
Redhead	1	0.4
Shoveler	1	0.4
Yellow-headed Blackbird	1	0.4
Loggerhead Shrike	1	0.4
Say's Phoebe	1	0.4

Total Individuals = 230

Total Species = 25

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Survey Route: PBF-SPERT  
Survey Date: 17 June 2002

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Species	Abundance	Percentage
Brewer's Sparrow	56	19.7
Western Meadowlark	45	15.8
Sage Thrasher	45	15.8
Brown-headed Cowbird	29	10.2
Horned Lark	27	9.5
Brewer's Blackbird	27	9.5
Sage Sparrow	23	8.1
Vesper Sparrow	6	2.1
Common Raven	6	2.1
House Finch	5	1.8
European Starling	4	1.4
Mourning Dove	3	1.1
Barn Swallow	2	0.7
Common Nighthawk	2	0.7
Say's Phoebe	2	0.7
Rock Wren	2	0.7

Total Individuals = 284

Total Species = 16

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Survey Route: RWMC  
Survey Date: 14 June 2002

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Species	Abundance	Percentage
Brewer's Sparrow	20	12.4
Horned Lark	17	10.6
Sage Thrasher	16	9.9
House Finch	13	8.1
Wilson's Phalarope	12	7.5
Sage Sparrow	9	5.6
Western Meadowlark	8	5.0
Killdeer	8	5.0
Cliff Swallow	8	5.0
Barn Swallow	7	4.3
Gadwall	6	3.7
Mallard	6	3.7
Red-winged Blackbird	6	3.7
Mourning Dove	6	3.7
Common Nighthawk	6	3.7
Spotted Sandpiper	3	1.9
Rock Wren	3	1.9
Say's Phoebe	2	1.2
Blue-winged Teal	2	1.2
European Starling	2	1.2
Yellow-headed Blackbird	1	0.6

Total Individuals = 161  
Total Species = 21

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Survey Route: TAN  
Survey Date: 16 June 2002

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Species	Abundance	Percentage
Horned Lark	112	24.1
Vesper Sparrow	63	13.5
Brewer's Sparrow	57	12.3
Sage Thrasher	49	10.5
Western Meadowlark	40	8.6
Sage Sparrow	35	7.5
Brewer's Blackbird	26	5.6
Mourning Dove	24	5.2
Bank Swallow	13	2.8
Brown-headed Cowbird	12	2.6
Grasshopper Sparrow	7	1.5
Rock Dove	6	1.3
European Starling	6	1.3
House Finch	6	1.3
Barn Swallow	4	0.9
Common Raven	2	0.4
Rock Wren	2	0.4
Northern Harrier	1	0.2

Total Individuals = 465

Total Species = 18

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Survey Route: IRR CIRCLE\*\*  
Survey Date: 15 June 2002

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Species	Abundance	Percentage
Western Meadowlark	14	23.3
Brown-headed Cowbird	9	15.0
Brewer's Sparrow	9	15.0
Brewer's Blackbird	8	13.3
Horned Lark	8	13.3
Sage Thrasher	6	10.0
Killdeer	3	5.0
Northern Harrier	1	1.7
Vesper Sparrow	1	1.7
Red-winged Blackbird	1	1.7
Total Individuals = 60		
Total Species = 10		

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\*\*Established in 1997.