

Appendix 4B: Survey Area Descriptions

The following accounts describe each survey area, giving habitat type, area surveyed, number of seasons surveyed, visibility, and mean counts, peak counts, and mean densities (birds per hectare) of birds. Details regarding calculations can be found in Appendix 2B. Some of the larger wetland complex areas were not completely covered by survey effort, and therefore density figures were calculated by the area (hectares) actually surveyed rather than the total area outlined by survey boundaries. These survey areas are identified with an asterisk (*) after the survey area name. At times, surveyors were not able to identify birds to the species level and instead recorded counts at the suite level (see Appendix 1B for suite designations). In some cases those counts were large numbers (i.e., flocks of waterfowl viewed at great distance). Suite counts are not included in the following Survey Area Descriptions and, therefore, the data presented may be regarded as conservative.

Caution Regarding Comparisons of New and Old Appendices

The new appendices (data spanning 1997 – 2017) should be considered as complementary to the ones created for the 2002 report (data spanning 1997 – 2001). The new appendices are particularly valuable in that they were generated from a dataset that spanned 21 years of observations, compared to 5 years for the old appendices. The old appendices are particularly valuable in that they were generated from a dataset that included many more survey areas and survey periods per year, compared to the new appendices. When viewed as complementary, a reader can use the two sets of appendices to gain a clearer picture about the relative abundances and distributions of waterbird species across Great Salt Lake.

Given the superficial resemblance between the two sets of appendices, it may be tempting to compare metrics to infer something about changes in abundance or distribution across the 21 years represented by the new dataset. Literal comparisons between the two sets of appendices are generally not recommended, however, due to changes in survey areas and survey periods over the years. In Appendix 2B, we describe a case study that illustrates the pitfalls of such comparisons.

A statistically rigorous analysis of trends based on the 21-year data set has been completed and will be made publicly available pending scientific peer-review process.

3 Stansbury Island South

Description: The stretch of mudflat between the pumping station on the south end of Stansbury Island and the railroad is a shoreline survey that was divided into two sections during the 1997-2001 Waterbird Survey but has since been surveyed as one combined section.

Primary Habitat: Saltwater Shorelines, Beaches and Playas

Area Size (ha): 1,725.8

Estimated Area Covered by Survey (ha): 1,725.8

Years Surveyed: 19

Detection Rates: Visibility is good, though at certain times mud may prohibit access to the shoreline by some distance, making detection and identification of small sandpipers and plovers difficult.

Species	Mean	Peak	Birds/ha	Species	Mean	Peak	Birds/ha
AGWT	0	4.5	0	GRYE	0.1	0.2	0
AMAV	1857.1	2701.5	1.076	KILL	0.7	1.2	0
AMCO	0	1.3	0	LBCU	0.6	4.4	0
AMWI	0	7.5	0	LBDO	14.9	44.8	0.009
AWPE	3.4	6.7	0.002	LESA	60.7	170.1	0.035
BASA	68.1	174.1	0.039	LESC	0.2	0.4	0
BBPL	0.4	0.8	0	LEYE	0.1	0.7	0
BCNH	0	0	0	MAGO	1.1	4.1	0.001
BLTE	0	0	0	MALL	1.4	4.5	0.001
BNST	0.8	1.1	0	NOPI	0.3	1.6	0
BUFF	0.1	0.2	0	NSHO	0.7	8.5	0
BWTE	0	0	0	PBGR	0	0	0
CAEG	0	0	0	RBGU	39.6	108.9	0.023
CAGO	4	7.8	0.002	REDH	0	6.8	0
CAGU	4757	8735.8	2.756	RNPH	0.6	307.4	0
CANV	0.1	0.1	0	RUDU	0	0	0
CATE	0.1	0.2	0	SACR	0	0.1	0
CITE	0	4.4	0	SAND	199.3	232.5	0.115
CLGR	0	0	0	SNEG	6.4	17.3	0.004
COGO	0.2	0.2	0	SNPL	117.1	182.8	0.068
DCCO	0.1	0.3	0	SPSA	0.1	0.1	0
EAGR	1442.9	4975.7	0.836	WEGR	0	0	0
FOTE	0	0	0	WESA	339.6	844.5	0.197
FRGU	1502.5	2355.8	0.871	WFIB	2.5	2.9	0.001
GADW	0.7	10.1	0	WILL	4.9	6.1	0.003
GBHE	0.1	0.3	0	WIPH	2398	4983.6	1.39

*7 Associated Duck Club**

Description: This survey area includes all accessible Ambassador Duck Club and Harrison Duck Club properties, and any other property where access is obtained within the Associated Duck Club area.

Primary Habitat: Fresh Water; Lakeside Uplands; Freshwater Wetlands

Area Size (ha): 5,910.5

Estimated Area Covered by Survey (ha): 886.6

Years Surveyed: 19

Detection Rates: This area is large and not completely covered by the survey route. Emergent vegetation obstructs visibility in some places.

Species	Mean	Peak	Birds/ha	Species	Mean	Peak	Birds/ha
AGWT	266.1	630.1	0.3	GRYE	6.3	25.3	0.007
AMAV	295.5	787.1	0.333	KILL	35.9	52.8	0.04
AMCO	512.5	1026.4	0.578	LBCU	23.8	27.2	0.027
AMWI	8.8	21.3	0.01	LBDO	19.8	164.4	0.022
AWPE	370.6	430.8	0.418	LESA	1.1	2.2	0.001
BASA	0	0	0	LESC	86.4	131.8	0.097
BBPL	36	52.4	0.041	LEYE	7.5	21.3	0.008
BCNH	9.9	17.6	0.011	MAGO	2.2	220.7	0.002
BLTE	7.9	12.1	0.009	MALL	300.7	620.5	0.339
BNST	355.4	431.2	0.401	NOPI	154.4	296.6	0.174
BUFF	2.2	3.2	0.002	NSHO	8.8	89.8	0.01
BWTE	3.7	4.4	0.004	PBGR	9.8	10.1	0.011
CAEG	0.5	1.6	0.001	RBGU	15.4	32.6	0.017
CAGO	227.5	288.6	0.257	REDH	4.5	47.9	0.005
CAGU	68.7	187.9	0.077	RNPH	0	19.9	0
CANV	1.8	2.3	0.002	RUDU	132.7	166.1	0.15
CATE	2.7	5.5	0.003	SACR	1.5	2.1	0.002
CITE	106.1	179.4	0.12	SAND	0	0	0
CLGR	1.9	2.4	0.002	SNEG	50.4	59.5	0.057
COGO	0.2	0.2	0	SNPL	0.8	1.4	0.001
DCCO	16	23.7	0.018	SPSA	1.4	2	0.002
EAGR	6.5	27	0.007	WEGR	4.5	6.4	0.005
FOTE	28.6	44.1	0.032	WESA	0.3	1.4	0
FRGU	381.6	429	0.43	WFIB	409.9	489.5	0.462
GADW	41.2	100.7	0.046	WILL	40.2	54.2	0.045
GBHE	27.1	46.8	0.031	WIPH	119.1	218.8	0.134

8a Kennecott - Lakeside

Description: This survey includes the section of shoreline between the old Saltair railroad grade and the Goggin Drain. Two independent teams surveyed area 8a. The raw data are separated accordingly in the database (areas 8a and 8b), but for simplicity the data are combined and named area 8a throughout this report.

Primary Habitat: Saltwater Shorelines, Beaches and Playas; Saltwater-Freshwater Interface

Area Size (ha): 580.3

Estimated Area Covered by Survey (ha): 580.3

Years Surveyed: 11

Detection Rates: Visibility is good for all of the shoreline section except at the Goggin Drain, where emergent vegetation blocks a good view.

Species	Mean	Peak	Birds/ha	Species	Mean	Peak	Birds/ha
AGWT	15.2	150.9	0.026	GRYE	0.5	1.6	0.001
AMAV	2788.7	3054.6	4.806	KILL	6.4	11.5	0.011
AMCO	1.2	4.4	0.002	LBCU	3.7	7.9	0.006
AMWI	0	4.1	0	LBDO	0.5	15.3	0.001
AWPE	1	1.8	0.002	LESA	0.3	1.5	0.001
BASA	0.9	4.2	0.002	LESC	0.2	0.2	0
BBPL	65.3	125.6	0.113	LEYE	0.1	0.3	0
BCNH	0.9	1.9	0.002	MAGO	2.8	14.5	0.005
BLTE	0	0	0	MALL	24.3	45.1	0.042
BNST	34.7	56.9	0.06	NOPI	2.7	6.3	0.005
BUFF	0	0	0	NSHO	15.9	117.6	0.027
BWTE	0.1	0.2	0	PBGR	0	0.1	0
CAEG	0	0	0	RBGU	2.8	5.2	0.005
CAGO	28.8	37.2	0.05	REDH	1.3	4	0.002
CAGU	2773.4	5157.1	4.779	RNPH	1.2	2.5	0.002
CANV	0	0.3	0	RUDU	2.8	4	0.005
CATE	0.1	0.4	0	SACR	0	0.1	0
CITE	11.4	16.3	0.02	SAND	14.3	28.6	0.025
CLGR	0	0	0	SNEG	0.4	0.6	0.001
COGO	0	0	0	SNPL	53.3	86.5	0.092
DCCO	1.9	4	0.003	SPSA	6.4	9.9	0.011
EAGR	1473	1979.2	2.538	WEGR	2.4	10.9	0.004
FOTE	0.2	1	0	WESA	201.7	229.5	0.348
FRGU	566.5	697.5	0.976	WFIB	22.9	28.3	0.039
GADW	8.1	57.2	0.014	WILL	11.7	19.8	0.02
GBHE	1.9	3.5	0.003	WIPH	13	46	0.022

10 Crystal Lakeside

Description: The Crystal Lakeside site includes area from the southernmost major drainage on the Crystal Unit of Farmington Bay WMA to the outflow of the Salt Lake City sewage canal at the southwest elbow of the Turpin dike. This survey is a total count done from an airboat via a public-access boat ramp in Farmington Bay WMA.

Primary Habitat: Saltwater Shorelines, Beaches and Playas; Freshwater Wetlands

Area Size (ha): 786.1

Estimated Area Covered by Survey (ha): 786.1

Years Surveyed: 19

Detection Rates: Emergent vegetation may obscure visibility in some areas.

Species	Mean	Peak	Birds/ha	Species	Mean	Peak	Birds/ha
AGWT	259.1	652.8	0.33	GRYE	4	18.8	0.005
AMAV	3051.9	3592.6	3.882	KILL	0.3	0.4	0
AMCO	108.5	605.2	0.138	LBCU	0.3	0.7	0
AMWI	0.4	3.8	0.001	LBDO	60.2	117.2	0.077
AWPE	144.2	204.4	0.183	LESA	0.1	0.9	0
BASA	0	0.9	0	LESC	12.1	12.7	0.015
BBPL	83.4	95.1	0.106	LEYE	0.7	1	0.001
BCNH	7.1	23.3	0.009	MAGO	8.4	40.2	0.011
BLTE	23	63.7	0.029	MALL	111.3	149.4	0.142
BNST	603.6	1023.3	0.768	NOPI	25.7	137.2	0.033
BUFF	0	0	0	NSHO	1074.8	2229.5	1.367
BWTE	0.7	1.1	0.001	PBGR	0.2	0.2	0
CAEG	0	0.1	0	RBGU	108.1	207.7	0.138
CAGO	23.2	33.4	0.03	REDH	16.2	34.6	0.021
CAGU	127.8	322.6	0.163	RNPH	11	500.1	0.014
CANV	0	0.1	0	RUDU	60.5	91.3	0.077
CATE	4.4	8.2	0.006	SACR	0	0.2	0
CITE	138.3	200.4	0.176	SAND	0.7	1.4	0.001
CLGR	0.2	0.4	0	SNEG	5.6	6.2	0.007
COGO	0	0	0	SNPL	0.1	0.6	0
DCCO	5	14.6	0.006	SPSA	0	0	0
EAGR	205.2	967.1	0.261	WEGR	0.9	3.6	0.001
FOTE	16.3	30.5	0.021	WESA	111.6	203.1	0.142
FRGU	345.9	635.3	0.44	WFIB	173.8	233.1	0.221
GADW	90.8	516.5	0.116	WILL	30.9	30.9	0.039
GBHE	2.2	3	0.003	WIPH	2682.2	3518.7	3.412

11 Farmington Bay Lakeside

Description: This is a shoreline survey done from a WMA dike road. The stretch includes lakeside area from the southwest elbow of the Turpin Dike to the Egg Island Observation Point. There is public access on this UDWR managed site.

Primary Habitat: Saltwater Shorelines, Beaches and Playas; Saltwater-Freshwater Interface

Area Size (ha): 522.2

Estimated Area Covered by Survey (ha): 522.2

Years Surveyed: 13

Detection Rates: Visibility was clear for the surveys from 1997-2001, but since 2004 emergent vegetation obstructs visibility in some places.

Species	Mean	Peak	Birds/ha	Species	Mean	Peak	Birds/ha
AGWT	17.9	405.3	0.034	GRYE	0.8	2.8	0.002
AMAV	702.6	869.5	1.345	KILL	6.8	15.4	0.013
AMCO	43.2	87.5	0.083	LBCU	0.5	0.5	0.001
AMWI	0	6	0	LBDO	58.7	469.2	0.112
AWPE	16.8	30.6	0.032	LESA	0	0.1	0
BASA	0	0	0	LESC	2.4	4.7	0.005
BBPL	0	0	0	LEYE	0.4	1	0.001
BCNH	2.6	3.2	0.005	MAGO	3.6	37.6	0.007
BLTE	1.5	4.2	0.003	MALL	8	40.3	0.015
BNST	231.9	349.4	0.444	NOPI	0.2	10.3	0
BUFF	0.1	0.2	0	NSHO	66.2	148.6	0.127
BWTE	1.3	7.5	0.002	PBGR	0.7	1	0.001
CAEG	0.6	1.5	0.001	RBGU	16	28.9	0.031
CAGO	19.7	42.2	0.038	REDH	0.6	8.1	0.001
CAGU	128	242.3	0.245	RNPH	0	0	0
CANV	0	0	0	RUDU	0.7	3.5	0.001
CATE	0.1	0.2	0	SACR	0.4	0.6	0.001
CITE	68.1	470.2	0.13	SAND	0	0.1	0
CLGR	0.1	0.4	0	SNEG	15.5	20.6	0.03
COGO	0	0	0	SNPL	0	0.1	0
DCCO	1.9	5.9	0.004	SPSA	0.4	0.6	0.001
EAGR	3.8	37.5	0.007	WEGR	1.8	2.6	0.003
FOTE	7.5	14.4	0.014	WESA	1.6	3	0.003
FRGU	70.1	77	0.134	WFIB	77.4	101.9	0.148
GADW	12.7	177.7	0.024	WILL	0.4	1.6	0.001
GBHE	3.1	3.9	0.006	WIPH	2829.6	8406.8	5.419

*12 Farmington Bay WMA**

Description: The area is a total count of all Farmington Bay WMA impoundments including Turpin. It is managed by the UDWR.

Primary Habitat: Freshwater Wetlands; Freshwater Shorelines

Area Size (ha): 4,544.5

Estimated Area Covered by Survey (ha): 2,953.9

Years Surveyed: 18

Detection Rates: Visibility varies due to emergent vegetation and large viewing distances in some units.

Species	Mean	Peak	Birds/ha	Species	Mean	Peak	Birds/ha
AGWT	2055	5032.4	0.696	GRYE	7.1	22.1	0.002
AMAV	4129.3	5348.3	1.398	KILL	34.1	47.3	0.012
AMCO	4704.6	7370.3	1.593	LBCU	2.7	34.2	0.001
AMWI	78	615.9	0.026	LBDO	929.2	1850.6	0.315
AWPE	1034	1127.6	0.35	LESA	3.3	7.9	0.001
BASA	0	0	0	LESC	1242.9	2123	0.421
BBPL	1.6	3.2	0.001	LEYE	5.7	15.6	0.002
BCNH	29.5	43.6	0.01	MAGO	19.8	441.2	0.007
BLTE	119.1	151.6	0.04	MALL	842.1	1404.9	0.285
BNST	1233.8	1804.4	0.418	NOPI	2196.8	5101	0.744
BUFF	85.4	153.3	0.029	NSHO	1569.1	3916.7	0.531
BWTE	0.7	3.3	0	PBGR	78.3	99.6	0.027
CAEG	0.9	1.8	0	RBGU	383.9	535.7	0.13
CAGO	325.5	475.8	0.11	REDH	333.2	666.4	0.113
CAGU	1155.9	1566.8	0.391	RNPH	0.9	6.8	0
CANV	43.6	82.6	0.015	RUDU	7301.1	11107.4	2.472
CATE	5.6	8.1	0.002	SACR	2.5	3.7	0.001
CITE	1365.5	2744.9	0.462	SAND	0.1	0.2	0
CLGR	66	104.7	0.022	SNEG	102.3	120.1	0.035
COGO	2	2.9	0.001	SNPL	0.4	0.8	0
DCCO	84.7	120.8	0.029	SPSA	2.1	3.9	0.001
EAGR	2113.8	4268.6	0.716	WEGR	146.4	262.4	0.05
FOTE	148.1	283.9	0.05	WESA	218.8	616.5	0.074
FRGU	738.5	851.1	0.25	WFIB	907.9	1265.1	0.307
GADW	1034	3311.1	0.35	WILL	6.2	7.2	0.002
GBHE	53.6	75.3	0.018	WIPH	662.7	1104.8	0.224

14d Antelope Island East & Audubon North

Description: The east side of Antelope Island State Park from the triangle intersection at the north causeway to the mainland gate at the south causeway, and east to the westernmost drainage of the Crystal Unit at Farmington Bay WMA. The southern portion of the survey is conducted from an airboat north to the peregrine falcon hawk tower at Seagull Point, Antelope Island, with a separate crew surveying the northern portion either from the east side road or from the shoreline by ATV or airboat. It is a total count.

Primary Habitat: Saltwater Shorelines, Beaches and Playas; Salt Marsh; Rocky Shorelines and Levees; Great Salt Lake Islands

Area Size (ha): 3,509.5

Estimated Area Covered by Survey (ha): 3,509.5

Years Surveyed: 17

Detection Rates: In some places the viewing distance can compromise identification. Vegetation and land configuration also block viewing in many places.

Species	Mean	Peak	Birds/ha	Species	Mean	Peak	Birds/ha
AGWT	9.8	346.4	0.003	GRYE	0	0	0
AMAV	10474.3	11709.4	2.985	KILL	6.3	8.8	0.002
AMCO	113.8	210.6	0.032	LBCU	3	3.8	0.001
AMWI	0.5	8.7	0	LBDO	0	25.5	0
AWPE	123.6	161	0.035	LESA	0.1	0.2	0
BASA	8.8	25.2	0.003	LESC	3.2	6.4	0.001
BBPL	46.5	81.3	0.013	LEYE	0	0.2	0
BCNH	0.2	0.8	0	MAGO	2.2	10.1	0.001
BLTE	0.1	0.2	0	MALL	11.7	20.5	0.003
BNST	376.7	731.6	0.107	NOPI	3.2	22.2	0.001
BUFF	1	1.8	0	NSHO	507	1296.5	0.144
BWTE	0	0.7	0	PBGR	0	0	0
CAEG	0	0	0	RBGU	244.7	294.2	0.07
CAGO	21.4	31.7	0.006	REDH	2.9	6.3	0.001
CAGU	711	1140.4	0.203	RNPH	273.9	1541.4	0.078
CANV	0	0.1	0	RUDU	5.1	18.8	0.001
CATE	4.7	10.9	0.001	SACR	0.4	0.7	0
CITE	21.8	58.4	0.006	SAND	147.9	294.9	0.042
CLGR	0	0	0	SNEG	0	0	0
COGO	0.4	0.5	0	SNPL	25.3	51.9	0.007
DCCO	1.5	4.7	0	SPSA	0	0	0
EAGR	906.2	1643.6	0.258	WEGR	0.1	0.2	0
FOTE	3	6.7	0.001	WESA	80.5	216.9	0.023
FRGU	1221.2	1743.3	0.348	WFIB	111.1	170.5	0.032
GADW	20.7	430.3	0.006	WILL	97.9	113.8	0.028
GBHE	1.3	2.8	0	WIPH	3977.1	6348.2	1.133

16 Antelope Island Causeway

Description: The north and south sides of the north causeway, from the entrance station to the three-way intersection on Antelope Island. These are total counts. Only birds within ¼ mile of the causeway are recorded. Public access is on a Davis County road.

Primary Habitat: Rocky Shorelines and Levees; Salt Water

Area Size (ha): 849.8

Estimated Area Covered by Survey (ha): 849.8

Years Surveyed: 14

Detection Rates: Visibility is good for most of the route. In some places, large rocks may obscure birds. It is possible to see the entire area on foot.

Species	Mean	Peak	Birds/ha	Species	Mean	Peak	Birds/ha
AGWT	3.7	9.2	0.004	GRYE	0	0.1	0
AMAV	2045.1	2484.2	2.407	KILL	6.8	18.9	0.008
AMCO	0	82.9	0	LBCU	2.1	5	0.002
AMWI	0	0.4	0	LBDO	4.6	10.9	0.005
AWPE	5	15	0.006	LESA	1.2	3.5	0.001
BASA	3.7	10.9	0.004	LESC	3.8	4.1	0.004
BBPL	58	92.2	0.068	LEYE	0	0	0
BCNH	0	0	0	MAGO	0.1	3	0
BLTE	0	0	0	MALL	0.4	5.4	0
BNST	653.3	1026.1	0.769	NOPI	0.1	25	0
BUFF	0.2	0.4	0	NSHO	27.6	94.8	0.032
BWTE	1.4	4.1	0.002	PBGR	0	0	0
CAEG	0	0.1	0	RBGU	930.3	1253.2	1.095
CAGO	18.6	27.9	0.022	REDH	0.4	2.6	0
CAGU	743	899.9	0.874	RNPH	5.8	1359.4	0.007
CANV	0	0	0	RUDU	3.1	6.1	0.004
CATE	0.1	0.2	0	SACR	0.4	1	0
CITE	0.3	4.2	0	SAND	87.5	146.5	0.103
CLGR	6.4	32.1	0.008	SNEG	0.2	0.6	0
COGO	0	0.1	0	SNPL	0.6	1.8	0.001
DCCO	3.6	7.7	0.004	SPSA	0.3	0.4	0
EAGR	3890.5	5637.1	4.578	WEGR	0.1	0.3	0
FOTE	0.1	0.3	0	WESA	144.5	162.6	0.17
FRGU	1979.9	2308.1	2.33	WFIB	79.2	131.3	0.093
GADW	0	8.6	0	WILL	38.3	47.1	0.045
GBHE	1.2	2.5	0.001	WIPH	3066.7	5916.2	3.609

17b West Kaysville - Shore

Description: This area is between the drainage, due west of the north end of the Central Davis County Sewer District, and the peregrine falcon hawk tower on the north. This area is the Great Salt Lake Shorelands Preserve, owned by The Nature Conservancy. Surveys were conducted from an airboat.

Primary Habitat: Saltwater-Freshwater Interface; Freshwater Wetlands; Saltwater Shorelines, Beaches and Playas

Area Size (ha): 1,331.8

Estimated Area Covered by Survey (ha): 1,331.8

Years Surveyed: 11

Detection Rates: Visibility is good along the shoreline section.

Species	Mean	Peak	Birds/ha	Species	Mean	Peak	Birds/ha
AGWT	54.7	579.1	0.041	GRYE	0.1	0.2	0
AMAV	15546.1	18425.8	11.673	KILL	0.1	0.5	0
AMCO	100.5	286.6	0.075	LBCU	0.1	0.2	0
AMWI	0	203.4	0	LBDO	6.4	2705.1	0.005
AWPE	263.5	440.5	0.198	LESA	0.6	1.8	0
BASA	2	4.4	0.002	LESC	25.8	41.5	0.019
BBPL	411.9	426.7	0.309	LEYE	0.1	0.3	0
BCNH	1.3	3.5	0.001	MAGO	8.6	830.1	0.006
BLTE	4.9	9.5	0.004	MALL	5.8	26.9	0.004
BNST	2856.2	3239.5	2.145	NOPI	11.3	34.5	0.008
BUFF	0.7	1.1	0.001	NSHO	325.1	1493.3	0.244
BWTE	0	0.6	0	PBGR	7.3	21.8	0.005
CAEG	2.2	6.5	0.002	RBGU	104.4	141.4	0.078
CAGO	26.8	41.5	0.02	REDH	3.2	24.2	0.002
CAGU	445.3	775.8	0.334	RNPH	585.4	4140.2	0.44
CANV	0.2	0.3	0	RUDU	37.5	68.1	0.028
CATE	16.6	30.3	0.012	SACR	0.8	2.8	0.001
CITE	28	217.1	0.021	SAND	164.8	329.5	0.124
CLGR	0	0	0	SNEG	2	3.4	0.002
COGO	0	0	0	SNPL	4.2	10	0.003
DCCO	2.5	3.4	0.002	SPSA	0.1	0.3	0
EAGR	131	418.1	0.098	WEGR	0.1	0.3	0
FOTE	20.3	46.7	0.015	WESA	1046.1	1602	0.785
FRGU	1029.1	1569.5	0.773	WFIB	606.1	848.5	0.455
GADW	12.2	878.1	0.009	WILL	250.9	397.5	0.188
GBHE	2.1	2.9	0.002	WIPH	28381.3	61406.6	21.31

18 West Layton

Description: The West Layton area is the shoreline between the peregrine falcon hack tower at the Great Salt Lake Shorelands Preserve and the entrance station on the Antelope Island causeway. The survey was conducted by foot from 1997-2001 and by airboat afterward. Land access is by permission from The Nature Conservancy.

Primary Habitat: Saltwater-Freshwater Interface; Saltwater Shorelines, Beaches and Playas

Area Size (ha): 525.9

Estimated Area Covered by Survey (ha): 525.9

Years Surveyed: 8

Detection Rates: Shoreline viewing is clear. In some years, access through the southern end was difficult because of extremely soft mud, so counts were not complete.

Species	Mean	Peak	Birds/ha	Species	Mean	Peak	Birds/ha
AGWT	2.5	7.6	0.005	GRYE	0.3	0.9	0.001
AMAV	6850.2	7764.1	13.026	KILL	1.8	6.1	0.003
AMCO	5.5	184.5	0.01	LBCU	0.3	0.3	0.001
AMWI	1.8	5.4	0.003	LBDO	4.2	10	0.008
AWPE	0.6	5.2	0.001	LESA	2.6	7.6	0.005
BASA	25.1	75.4	0.048	LESC	12.1	14.3	0.023
BBPL	99.8	130	0.19	LEYE	0	0	0
BCNH	0	0	0	MAGO	0.6	369	0.001
BLTE	0	0	0	MALL	6.6	24.3	0.013
BNST	250	477.3	0.475	NOPI	0.5	29.8	0.001
BUFF	0.1	0.2	0	NSHO	158	837	0.3
BWTE	0	0.5	0	PBGR	0	0	0
CAEG	0.1	0.6	0	RBGU	107.2	126.9	0.204
CAGO	36.5	76.3	0.069	REDH	0.7	7.7	0.001
CAGU	350.6	541.9	0.667	RNPH	14.9	868.6	0.028
CANV	0	0.1	0	RUDU	3.7	7.3	0.007
CATE	0.1	0.3	0	SACR	0.4	1.4	0.001
CITE	7.9	12.9	0.015	SAND	0.1	0.2	0
CLGR	0	0.1	0	SNEG	0.4	0.7	0.001
COGO	0	0	0	SNPL	4.4	8.6	0.008
DCCO	0	0.1	0	SPSA	0.3	0.4	0.001
EAGR	47.6	89.4	0.091	WEGR	0	0.1	0
FOTE	1.1	4.8	0.002	WESA	512.6	1532.9	0.975
FRGU	839.7	1378.7	1.597	WFIB	55.8	129.3	0.106
GADW	8.4	100.3	0.016	WILL	47.4	75.7	0.09
GBHE	0.3	0.7	0.001	WIPH	6090.3	17409.3	11.581

*19d Howard Slough WMA**

Description: Howard Slough WMA is an area count along the drivable dikes including the impoundments and lakeside areas. The area is managed by the UDWR.

Primary Habitat: Saltwater Shorelines, Beaches and Playas; Saltwater-Freshwater Interface

Area Size (ha): 569.3

Estimated Area Covered by Survey (ha): 483.9

Years Surveyed: 14

Detection Rates: Restricted access on the mudflat beach and on the WMA dikes makes viewing distances greater. Due to extreme distances, bird identification and counts may be compromised.

Species	Mean	Peak	Birds/ha	Species	Mean	Peak	Birds/ha
AGWT	540.5	2499.5	1.117	GRYE	2.2	4.7	0.005
AMAV	67.2	98	0.139	KILL	20.3	55.5	0.042
AMCO	391.7	1274.6	0.809	LBCU	3.7	3.8	0.008
AMWI	11.6	131.1	0.024	LBDO	310.1	452.1	0.641
AWPE	175.1	199.8	0.362	LESA	1.3	3.6	0.003
BASA	0.2	0.6	0	LESC	606.8	835.7	1.254
BBPL	0	0.2	0	LEYE	1.7	4	0.004
BCNH	15.9	24.1	0.033	MAGO	1.2	37.6	0.002
BLTE	0.5	1.1	0.001	MALL	369.2	759.3	0.763
BNST	196.4	264	0.406	NOPI	295.1	831.9	0.61
BUFF	14.6	22.2	0.03	NSHO	68.7	642.5	0.142
BWTE	0.2	3.8	0	PBGR	18.2	29.9	0.038
CAEG	2.7	8.5	0.006	RBGU	100.3	135.6	0.207
CAGO	94.8	135.7	0.196	REDH	7.5	140.5	0.015
CAGU	137.3	209.9	0.284	RNPH	0	0.1	0
CANV	16.5	32	0.034	RUDU	490.5	703.8	1.014
CATE	0.5	1.5	0.001	SACR	3.8	5.5	0.008
CITE	479.2	1252	0.99	SAND	0	2.9	0
CLGR	4.1	11	0.008	SNEG	33.2	37.1	0.069
COGO	4.7	8.6	0.01	SNPL	0	0	0
DCCO	7.3	8.6	0.015	SPSA	0.8	1.6	0.002
EAGR	4.4	255.5	0.009	WEGR	9.4	18.1	0.019
FOTE	19.2	35.7	0.04	WESA	3.4	10.3	0.007
FRGU	117.6	173.6	0.243	WFIB	530.3	735.1	1.096
GADW	225.3	790.8	0.466	WILL	5.3	9.5	0.011
GBHE	17.9	30.6	0.037	WIPH	11.9	35.1	0.025

*20a Ogden Bay WMA**

Description: This area includes all of the impoundments and drivable interior dikes of the Ogden Bay WMA, except for Unit 2. It is a total count survey and managed by the UDWR.

Primary Habitat: Freshwater Wetlands; Riparian Systems; Fresh Water

Area Size (ha): 2,495.6

Estimated Area Covered by Survey (ha): 1,497.4

Years Surveyed: 14

Detection Rates: Emergent vegetation obstructs viewing in several areas.

Species	Mean	Peak	Birds/ha	Species	Mean	Peak	Birds/ha
AGWT	553	4285.2	0.369	GRYE	10.4	24.1	0.007
AMAV	156.6	523.4	0.105	KILL	18.5	26.9	0.012
AMCO	1731.5	2680.9	1.156	LBCU	10.6	17.1	0.007
AMWI	12.7	232.8	0.008	LBDO	462.1	929.5	0.309
AWPE	306	378.2	0.204	LESA	3.7	7.8	0.002
BASA	0.1	0.2	0	LESC	171.6	254.5	0.115
BBPL	0.1	0.2	0	LEYE	18.8	51.1	0.013
BCNH	21.4	30.4	0.014	MAGO	10.4	531.5	0.007
BLTE	2.6	7	0.002	MALL	560.3	835.5	0.374
BNST	282.3	373.9	0.189	NOPI	300.6	753.1	0.201
BUFF	14.4	25.6	0.01	NSHO	84.9	1093.5	0.057
BWTE	0.2	6.4	0	PBGR	24.7	31.7	0.016
CAEG	1.1	1.6	0.001	RBGU	39	53.7	0.026
CAGO	87.6	132.8	0.059	REDH	40.5	185.2	0.027
CAGU	93.5	159.6	0.062	RNPH	0	0	0
CANV	14.6	27.9	0.01	RUDU	608.4	837.5	0.406
CATE	4.7	9.8	0.003	SACR	6.2	8.6	0.004
CITE	570.2	2551.5	0.381	SAND	0	0	0
CLGR	16.2	21.6	0.011	SNEG	112.1	224	0.075
COGO	18.2	36.2	0.012	SNPL	0	0.2	0
DCCO	47.8	72.2	0.032	SPSA	1.7	3.9	0.001
EAGR	56.4	563.9	0.038	WEGR	40.2	47.8	0.027
FOTE	50	73.6	0.033	WESA	1.7	4.8	0.001
FRGU	176.5	208	0.118	WFIB	941	1385.9	0.628
GADW	638.5	1423.4	0.426	WILL	5.5	6.5	0.004
GBHE	37	52.4	0.025	WIPH	18.8	45.2	0.013

22 Ogden Bay North

Description: This is a shoreline piece from the North Fork of the Weber River to the railroad tracks, surveyed from an airboat. Counts do not include gulls and other birds that are directly associated with the Mud Island rookery, if it is active. The area has public access.

Primary Habitat: Saltwater Shorelines, Beaches and Playas

Area Size (ha): 389.4

Estimated Area Covered by Survey (ha): 389.4

Years Surveyed: 8

Detection Rates: Visibility is clear. The mudflat is only viewed from the airboat. Often snowy plovers and small sandpipers are viewed along the water edge. However, the more inland parts of the mudflat are not searched, so snowy plover numbers are likely very conservative. Also, it can be difficult to separate flocks for counting when the airboat causes birds to flush and blend with others farther down the route.

Species	Mean	Peak	Birds/ha	Species	Mean	Peak	Birds/ha
AGWT	0	2.5	0	GRYE	0	0	0
AMAV	906.2	1574	2.327	KILL	0	0	0
AMCO	0	0	0	LBCU	0.1	0.3	0
AMWI	0	1.9	0	LBDO	0	6.6	0
AWPE	0	0.6	0	LESA	1	3.1	0.003
BASA	0.5	13.6	0.001	LESC	26.8	53.1	0.069
BBPL	1.7	2.9	0.004	LEYE	0	0	0
BCNH	0	0	0	MAGO	0.3	6.9	0.001
BLTE	0	0	0	MALL	0	0	0
BNST	59.5	164.1	0.153	NOPI	0.8	2	0.002
BUFF	0.1	0.1	0	NSHO	0	7.1	0
BWTE	0	0.4	0	PBGR	0	0	0
CAEG	0	0	0	RBGU	70.5	105	0.181
CAGO	0.3	2.2	0.001	REDH	0.6	15	0.002
CAGU	893.9	1990.1	2.296	RNPH	0.1	327.2	0
CANV	0	0	0	RUDU	0	0	0
CATE	0.1	0.6	0	SACR	0	0	0
CITE	0	8.8	0	SAND	7.2	14.2	0.018
CLGR	0	0	0	SNEG	0	0	0
COGO	0	0	0	SNPL	17.1	65	0.044
DCCO	1.2	2.1	0.003	SPSA	0	0	0
EAGR	0	32.9	0	WEGR	0	0	0
FOTE	15.5	77.4	0.04	WESA	0.3	31.4	0.001
FRGU	1482.4	1978.6	3.807	WFIB	0.2	7.6	0.001
GADW	0.8	14.4	0.002	WILL	8.3	14	0.021
GBHE	0.3	0.9	0.001	WIPH	3476.3	7886.6	8.927

22b Ogden Bay Lakeside

Description: This area is surveyed by airboat as a total count and includes the Pintail Flats portion of Ogden Bay WMA, between the North and South forks of the Weber River and south to the peregrine falcon hawk tower between Ogden Bay WMA and Howard Slough WMA.

Primary Habitat: Saltwater-Freshwater Interface; Freshwater Wetlands; Saltwater Shorelines, Beaches and Playas

Area Size (ha): 850.5

Estimated Area Covered by Survey (ha): 850.5

Years Surveyed: 4

Detection Rates: The easternmost part of the area is covered with emergent vegetation and not all birds are detectable. The noise of the airboat flushes many birds, but it is likely that many hide in the vegetation. In the western part, visibility is good, but it can be difficult to separate flocks for counting when the airboat causes birds to flush, blending in with other groups farther down the route. Also, flock sizes can be large and the viewing perspective from the airboat when birds are clumped on the ground isn't as favorable as an aerial view.

Species	Mean	Peak	Birds/ha	Species	Mean	Peak	Birds/ha
AGWT	56.2	2042.5	0.066	GRYE	0.3	1	0
AMAV	3026.1	3414.8	3.558	KILL	0.6	1	0.001
AMCO	0	62.8	0	LBCU	2.5	3.2	0.003
AMWI	0	31	0	LBDO	20	707.8	0.024
AWPE	0	1.2	0	LESA	0.1	4.5	0
BASA	0	0	0	LESC	1.5	3	0.002
BBPL	123.8	209.2	0.146	LEYE	4.4	19.2	0.005
BCNH	0.4	1.2	0	MAGO	6.6	858.2	0.008
BLTE	0	0	0	MALL	17.8	52	0.021
BNST	256.9	501	0.302	NOPI	10.4	30	0.012
BUFF	0	0	0	NSHO	6.5	174	0.008
BWTE	0	0.5	0	PBGR	0	0.2	0
CAEG	0	0	0	RBGU	241.7	462.5	0.284
CAGO	57	65	0.067	REDH	0	2	0
CAGU	1263	2957.5	1.485	RNPH	62.5	181.5	0.073
CANV	0	0	0	RUDU	0	0	0
CATE	0	0	0	SACR	0	0	0
CITE	12.1	126.5	0.014	SAND	250.1	500.2	0.294
CLGR	0	0	0	SNEG	0.2	0.5	0
COGO	0.2	0.5	0	SNPL	5.2	18.8	0.006
DCCO	1.9	9.5	0.002	SPSA	0	0	0
EAGR	0.2	0.5	0	WEGR	0	0.2	0
FOTE	0	0	0	WESA	205	508.2	0.241
FRGU	1112.9	1356.2	1.309	WFIB	74.4	617	0.087
GADW	0.2	235.5	0	WILL	101.8	145.2	0.12
GBHE	1	2.8	0.001	WIPH	2814.2	6788.8	3.309

25 Harold Crane WMA*

Description: Harold Crane WMA is a total count survey from all drivable interior dikes within the WMA and is managed by the UDWR.

Primary Habitat: Freshwater Wetlands; Lakeside Uplands

Area Size (ha): 1,773.4

Estimated Area Covered by Survey (ha): 585.2

Years Surveyed: 18

Detection Rates: Some ponds are obstructed from view by tall emergent vegetation. By leaving the dike roads, all ponds could be accessed on foot for better viewing.

Species	Mean	Peak	Birds/ha	Species	Mean	Peak	Birds/ha
AGWT	1445.6	3719.1	2.47	GRYE	11.2	21.4	0.019
AMAV	1269	1434.8	2.168	KILL	14	21.8	0.024
AMCO	1050.7	1477.9	1.795	LBCU	8.1	52.7	0.014
AMWI	81.5	190.6	0.139	LBDO	754.8	915.8	1.29
AWPE	306.2	360.6	0.523	LESA	4.4	6.8	0.008
BASA	0.6	1.9	0.001	LESC	201.5	338.9	0.344
BBPL	3.5	6.8	0.006	LEYE	15.7	28.6	0.027
BCNH	38.1	57.8	0.065	MAGO	232.3	532.6	0.397
BLTE	20	27.4	0.034	MALL	1723.8	3349.6	2.946
BNST	1102	1358.3	1.883	NOPI	1129.9	2727.5	1.931
BUFF	8.5	13.7	0.015	NSHO	585.2	1447.8	1
BWTE	3.1	7.5	0.005	PBGR	20.8	34.4	0.036
CAEG	0.6	1.3	0.001	RBGU	68.7	104.7	0.117
CAGO	649.6	791.4	1.11	REDH	126.1	161.9	0.215
CAGU	166.4	227.8	0.284	RNPH	0	1.1	0
CANV	11.6	20.9	0.02	RUDU	594.3	789.1	1.016
CATE	2.8	8.2	0.005	SACR	7	10.1	0.012
CITE	1367.3	1752.3	2.336	SAND	0	0	0
CLGR	10.7	16	0.018	SNEG	94.8	125.4	0.162
COGO	2.5	4.5	0.004	SNPL	1.1	2.1	0.002
DCCO	30.5	47.2	0.052	SPSA	0.7	1.3	0.001
EAGR	4.1	488.2	0.007	WEGR	33	57.8	0.056
FOTE	76.3	130.4	0.13	WESA	3.9	6.8	0.007
FRGU	313.1	403.7	0.535	WFIB	1248.5	1671.8	2.133
GADW	1069.1	2025.6	1.827	WILL	7	9.2	0.012
GBHE	37.5	61.3	0.064	WIPH	156.5	236.5	0.267

28c Willard Spur, Willard Bay & South Bear River

Description: This area is a large wetland and reservoir complex south of the D-Line dike in the Bear River Migratory Bird Refuge, with emergent marsh or sandbar fringe on the north, Interstate 15 on the east, the North Harold Crane dike and emergent marsh on the south, and the northern reaches of Bear River Bay on the west. It is surveyed from an airplane in four transects running in an east-west orientation spaced 1-mile apart. The area is managed by USFWS, UDWR, and Utah Division of State Parks and Recreation.

Primary Habitat: Freshwater Wetlands; Fresh Water; Freshwater Shorelines

Area Size (ha): 19,870.9

Estimated Area Covered by Survey (ha): 19,870.9

Years Surveyed: 14

Detection Rates: Because this area is rich in numbers and diversity of species, it is difficult to count and identify birds from the air. Survey accuracy in this important area is not good. An observer counts out 1/8 mile on either side of the plane. The transect data were extrapolated to reflect total coverage. The true birds/ha is most likely much greater than the data listed here.

Species	Mean	Peak	Birds/ha	Species	Mean	Peak	Birds/ha
AGWT	4792.8	15987.2	0.241	GRYE	0.1	0.3	0
AMAV	2032.6	6540.4	0.102	KILL	1.4	3.7	0
AMCO	6871	18509.2	0.346	LBCU	0	1.4	0
AMWI	68.2	906	0.003	LBDO	2948.6	4540	0.148
AWPE	4896.5	6938.3	0.246	LESA	0	84	0
BASA	0	0	0	LESC	1934.4	3343.6	0.097
BBPL	0	11.4	0	LEYE	1.3	5.7	0
BCNH	10.4	19.7	0.001	MAGO	3340.1	3860.3	0.168
BLTE	209.6	270.3	0.011	MALL	1516.8	3104.3	0.076
BNST	4925.3	5429.7	0.248	NOPI	554.1	1374.6	0.028
BUFF	83.3	134.4	0.004	NSHO	1201.7	3970.4	0.06
BWTE	0	20	0	PBGR	0	0	0
CAEG	0.7	3.7	0	RBGU	1284.5	2014	0.065
CAGO	868.8	1341.4	0.044	REDH	472.3	1286.4	0.024
CAGU	3181.1	5164	0.16	RNPH	0	46.3	0
CANV	291	541.2	0.015	RUDU	11084.1	16835.6	0.558
CATE	9.6	13.1	0	SACR	5.9	11.1	0
CITE	2810.4	5689.4	0.141	SAND	0	0	0
CLGR	2	4	0	SNEG	449.6	492.9	0.023
COGO	58	92	0.003	SNPL	0	0	0
DCCO	66.4	127.1	0.003	SPSA	0.9	1.4	0
EAGR	454.5	1353.1	0.023	WEGR	308.2	737.4	0.016
FOTE	411.3	689.4	0.021	WESA	0	0	0
FRGU	4267.1	6036	0.215	WFIB	8927.3	10643.1	0.449
GADW	1337.5	6791.2	0.067	WILL	16.2	30.9	0.001
GBHE	68.2	151.7	0.003	WIPH	334.1	625.7	0.017

*29 Bear River Migratory Bird Refuge**

Description: The area includes all impounded units and any appropriate habitat with established dike units, within the Bear River Migratory Bird Refuge. The area is managed by the USFWS.

Primary Habitat: Freshwater Wetlands; Fresh Water

Area Size (ha): 10,449.4

Estimated Area Covered by Survey (ha): 3,134.8

Years Surveyed: 16

Detection Rates: Due to emergent vegetation and viewing distances, visibility is considerably limited.

Species	Mean	Peak	Birds/ha	Species	Mean	Peak	Birds/ha
AGWT	9709.9	21261.8	3.097	GRYE	15	27.1	0.005
AMAV	8618	10887.2	2.749	KILL	33.1	52.2	0.011
AMCO	11610.1	14385.3	3.704	LBCU	16.2	17.2	0.005
AMWI	1673.4	4641.9	0.534	LBDO	1580.7	2267.2	0.504
AWPE	2812.6	3030.2	0.897	LESA	9.2	10.5	0.003
BASA	12.8	23.4	0.004	LESC	2089.3	3340.4	0.666
BBPL	0.6	1.2	0	LEYE	44.7	81	0.014
BCNH	24.9	39.5	0.008	MAGO	1735.6	2618.1	0.554
BLTE	83.3	192.2	0.027	MALL	5442.2	9454.8	1.736
BNST	8209.4	10455.3	2.619	NOPI	10330.2	21641.5	3.295
BUFF	170.4	272.7	0.054	NSHO	4886.3	10271.4	1.559
BWTE	0.2	8.8	0	PBGR	26.2	29.6	0.008
CAEG	1.8	7.7	0.001	RBGU	830.4	1261.1	0.265
CAGO	3090.4	4148.3	0.986	REDH	524.9	1207.8	0.167
CAGU	3575.6	6468.9	1.141	RNPH	0.3	33.1	0
CANV	151.8	239.1	0.048	RUDU	2027.7	2565.6	0.647
CATE	34.9	65.8	0.011	SACR	8	17.1	0.003
CITE	3652.7	5743.6	1.165	SAND	0	0	0
CLGR	110.8	153.7	0.035	SNEG	394.6	524.1	0.126
COGO	3.4	6.2	0.001	SNPL	3.5	6	0.001
DCCO	596.8	747.8	0.19	SPSA	14.5	15.3	0.005
EAGR	219.5	2029.8	0.07	WEGR	226	280.1	0.072
FOTE	89.7	161.5	0.029	WESA	194.8	523.9	0.062
FRGU	4980.9	5600.8	1.589	WFIB	9426.6	10640.1	3.007
GADW	5432	9183.2	1.733	WILL	7.3	7.6	0.002
GBHE	95.5	122	0.03	WIPH	522.7	887.1	0.167

32 Public Shooting Grounds WMA*

Description: The area includes all accessible sites within the Public Shooting Grounds WMA, with emphasis on the impoundments. It is managed by the UDWR.

Primary Habitat: Freshwater Wetlands; Fresh Water

Area Size (ha): 3,248.7

Estimated Area Covered by Survey (ha): 649.7

Years Surveyed: 12

Detection Rates: Detection rate for shorebirds is assumed to be 100%, as they are mostly avocets and stilts. There is a large expanse of potholes that is not visible from the dike roads and probably hides waterfowl and other waterbirds.

Species	Mean	Peak	Birds/ha	Species	Mean	Peak	Birds/ha
AGWT	1764.8	3828.8	2.716	GRYE	6.8	13.5	0.01
AMAV	196.6	614.6	0.303	KILL	4	6	0.006
AMCO	1371.7	5187.6	2.111	LBCU	0.9	1	0.001
AMWI	60.2	334.2	0.093	LBDO	0.7	4.7	0.001
AWPE	108.8	154.5	0.167	LESA	0.1	0.4	0
BASA	0.2	0.4	0	LESC	86.3	140.4	0.133
BBPL	0	0	0	LEYE	1.4	3.2	0.002
BCNH	6.1	6.8	0.009	MAGO	11.6	34.4	0.018
BLTE	0.1	0.2	0	MALL	1337.5	2985.5	2.059
BNST	338.9	406.8	0.522	NOPI	4490.7	9717.6	6.912
BUFF	42.1	67.5	0.065	NSHO	444.5	1495	0.684
BWTE	0.2	0.5	0	PBGR	12	14.7	0.018
CAEG	0.2	0.8	0	RBGU	85.8	112.5	0.132
CAGO	419.2	475.9	0.645	REDH	172.5	356.5	0.266
CAGU	127.9	235.3	0.197	RNPH	0	0.9	0
CANV	45	196.7	0.069	RUDU	215.6	258.9	0.332
CATE	0.3	0.6	0	SACR	5.3	8	0.008
CITE	400.3	797.3	0.616	SAND	0	0	0
CLGR	23.3	34.4	0.036	SNEG	41.1	63.9	0.063
COGO	1.5	2.4	0.002	SNPL	0.7	2.4	0.001
DCCO	9.5	33.1	0.015	SPSA	0.4	0.9	0.001
EAGR	29.7	131.5	0.046	WEGR	36.9	58.9	0.057
FOTE	46.9	79.9	0.072	WESA	0.8	2.5	0.001
FRGU	359.6	587.3	0.553	WFIB	501	859.9	0.771
GADW	456.6	910.5	0.703	WILL	20.1	22.4	0.031
GBHE	22.1	32	0.034	WIPH	8.3	23.4	0.013

33 Salt Creek WMA*

Description: The area includes all accessible sites within the Salt Creek WMA, with emphasis on the impoundments. This site is managed by UDWR.

Primary Habitat: Freshwater Wetlands; Lakeside Uplands

Area Size (ha): 863.4

Estimated Area Covered by Survey (ha): 302.2

Years Surveyed: 10

Detection Rates: Detection rate for larger shorebirds is assumed to be 99% (dowitchers, stilts, avocets). Tall vegetation is a barrier, however. Of the total WMA, 35% is surveyed, but 55% is good waterbird habitat.

Species	Mean	Peak	Birds/ha	Species	Mean	Peak	Birds/ha
AGWT	1125	2546.6	3.723	GRYE	7.3	12.2	0.024
AMAV	410.1	549.8	1.357	KILL	9.8	21	0.032
AMCO	244.8	1097.2	0.81	LBCU	1.2	1.2	0.004
AMWI	44.4	111.4	0.147	LBDO	10.9	159.7	0.036
AWPE	124.9	146.1	0.413	LESA	0.1	0.3	0
BASA	0.5	1.4	0.002	LESC	41.8	71.4	0.138
BBPL	0	0	0	LEYE	6.6	19	0.022
BCNH	5.1	10.6	0.017	MAGO	2.6	7.9	0.009
BLTE	0.1	0.2	0	MALL	678.6	1170.8	2.246
BNST	226.1	291.9	0.748	NOPI	1926	4115.9	6.373
BUFF	7.4	9.2	0.024	NSHO	226.5	507.2	0.75
BWTE	0.1	0.6	0	PBGR	4.5	7	0.015
CAEG	0.2	0.9	0.001	RBGU	53.5	59.8	0.177
CAGO	537.7	762.9	1.779	REDH	19.8	60.1	0.066
CAGU	115.6	162.4	0.383	RNPH	0	0.3	0
CANV	37	70.4	0.122	RUDU	58.2	65.5	0.193
CATE	0.2	0.4	0.001	SACR	35	63.4	0.116
CITE	204.2	543.1	0.676	SAND	0	0	0
CLGR	8.2	29.4	0.027	SNEG	31	38.6	0.103
COGO	0.1	0.1	0	SNPL	0	0	0
DCCO	13.1	21.8	0.043	SPSA	1.2	1.6	0.004
EAGR	4.4	20.4	0.015	WEGR	9.4	26.6	0.031
FOTE	12.2	24.9	0.04	WESA	2.7	4.1	0.009
FRGU	129	149.3	0.427	WFIB	631.6	653.4	2.09
GADW	198.9	313.4	0.658	WILL	20	27.6	0.066
GBHE	14.3	25.4	0.047	WIPH	16.8	47.5	0.056

*35 Locomotive Springs WMA**

Description: This survey area includes all established management units and outflow areas that are a part of Locomotive Springs WMA. It is managed by the UDWR.

Primary Habitat: Freshwater Wetlands; Saltwater Shorelines, Beaches and Playas; Salt Marsh

Area Size (ha): 7,607.9

Estimated Area Covered by Survey (ha): 304.3

Years Surveyed: 10

Detection Rates: Approximately 80% of this area has good visibility. Some marshy areas are inaccessible, and some large ponds are difficult to see across from the dike. Of 20,000 acres, 4% was covered by surveys, and 17% is good waterbird habitat. The mudflat is where snowy plovers have been observed in large numbers in other studies but were not surveyed here.

Species	Mean	Peak	Birds/ha	Species	Mean	Peak	Birds/ha
AGWT	151	419.9	0.496	GRYE	2.7	5.4	0.009
AMAV	25.9	150.3	0.085	KILL	9	13.6	0.03
AMCO	18.8	431.6	0.062	LBCU	3.3	5.5	0.011
AMWI	5.4	109.7	0.018	LBDO	13	59.7	0.043
AWPE	5.7	23.9	0.019	LESA	2.9	5.7	0.01
BASA	0.6	0.8	0.002	LESC	19.7	23.1	0.065
BBPL	1.8	3.6	0.006	LEYE	4.1	7.3	0.013
BCNH	1.5	2.2	0.005	MAGO	4.2	7.6	0.014
BLTE	0.5	1.3	0.002	MALL	116.8	211	0.384
BNST	11.8	41.7	0.039	NOPI	123.8	346.8	0.407
BUFF	22.1	37.4	0.073	NSHO	23.7	187.4	0.078
BWTE	0.7	3	0.002	PBGR	0.9	1.9	0.003
CAEG	0	0	0	RBGU	2.3	13.1	0.008
CAGO	6.4	44.6	0.021	REDH	94.3	231.9	0.31
CAGU	37.8	82.6	0.124	RNPH	1.7	3.4	0.006
CANV	21.6	186.5	0.071	RUDU	5.1	7.9	0.017
CATE	1.1	2.6	0.004	SACR	0.6	1.2	0.002
CITE	66.5	158.6	0.219	SAND	0	6.1	0
CLGR	0	0	0	SNEG	1.2	1.9	0.004
COGO	0.6	1.3	0.002	SNPL	43.8	83.5	0.144
DCCO	1.8	5	0.006	SPSA	0.7	1.4	0.002
EAGR	0.2	7.9	0.001	WEGR	0.2	1	0.001
FOTE	2.6	11.6	0.009	WESA	25.2	41.9	0.083
FRGU	0.4	9.3	0.001	WFIB	61.4	75.2	0.202
GADW	48.6	100.2	0.16	WILL	48.5	51.3	0.159
GBHE	5.4	8.4	0.018	WIPH	43.4	46	0.143

36b Salt Wells Flat WHA*

Description: The survey area includes all established management units and outflow areas that are a part of Salt Wells Flat WHA. The area is managed by the BLM.

Primary Habitat: Salt Marsh; Saltwater Shorelines, Beaches and Playas

Area Size (ha): 1,659.8

Estimated Area Covered by Survey (ha): 663.9

Years Surveyed: 10

Detection Rates: Visibility on the open mud flats is 100%. At the ponds, tall, emergent vegetation blocked visibility and observers can only see 65%. Access is good and visibility could be increased from an observation tower. Mud is very soft, so it is difficult to walk out into the area.

Species	Mean	Peak	Birds/ha	Species	Mean	Peak	Birds/ha
AGWT	28.1	141.9	0.042	GRYE	1.5	3.4	0.002
AMAV	22	170.6	0.033	KILL	4.7	6	0.007
AMCO	0.4	92.4	0.001	LBCU	3.1	11	0.005
AMWI	0.1	35.7	0	LBDO	2.5	24	0.004
AWPE	0.3	1.5	0	LESA	1.5	6.1	0.002
BASA	0.1	13.3	0	LESC	1.1	1.3	0.002
BBPL	0.2	0.4	0	LEYE	2.2	5.9	0.003
BCNH	0	0	0	MAGO	0.2	0.5	0
BLTE	0	0	0	MALL	35.7	66.4	0.054
BNST	20	67.9	0.03	NOPI	22.2	33.6	0.033
BUFF	3.8	5	0.006	NSHO	3.9	55.4	0.006
BWTE	4.7	6.7	0.007	PBGR	0.1	0.2	0
CAEG	0	0	0	RBGU	0	0.6	0
CAGO	3.3	22.2	0.005	REDH	5.6	15	0.008
CAGU	13	34.3	0.02	RNPH	0.3	12	0
CANV	1.1	5	0.002	RUDU	1.5	2.3	0.002
CATE	0.1	0.4	0	SACR	0.6	0.9	0.001
CITE	51.9	86.7	0.078	SAND	1	1.8	0.002
CLGR	0	0	0	SNEG	0.2	1	0
COGO	1.1	2.1	0.002	SNPL	48.6	71.1	0.073
DCCO	0	0.1	0	SPSA	0.2	0.5	0
EAGR	0.2	1.2	0	WEGR	0.1	0.7	0
FOTE	0	0.1	0	WESA	65.7	125.6	0.099
FRGU	0.1	9.7	0	WFIB	55.8	70.1	0.084
GADW	26.7	52.3	0.04	WILL	44.3	53.4	0.067
GBHE	1.5	2.4	0.002	WIPH	6.4	21.1	0.01

37a Bear River Bay & East Promontory

Description: Includes Bear River Bay in an open-water area between the railroad causeway on the south and Bear River Migratory Bird Refuge on the north. It was surveyed from an airplane in east-west running transects, spaced 1-mile apart. Observers counted birds on both sides of the plane out to 1/8 mile. To extrapolate to the whole area, transect counts were multiplied by four. The site has public access.

Primary Habitat: Fresh Water; Freshwater Wetlands

Area Size (ha): 17,955.2

Estimated Area Covered by Survey (ha): 17,955.2

Years Surveyed: 14

Detection Rates: It is difficult to count and identify birds while flying at speeds of 80 mph. It is also very difficult to see small birds. Survey accuracy in this area is not good.

Species	Mean	Peak	Birds/ha	Species	Mean	Peak	Birds/ha
AGWT	6661.4	14797.1	0.371	GRYE	0	0	0
AMAV	4123.5	9144.8	0.23	KILL	0.3	0.8	0
AMCO	1468.6	2088	0.082	LBCU	2.7	3.7	0
AMWI	85.4	1616.8	0.005	LBDO	105.2	315.7	0.006
AWPE	1305.5	1510.9	0.073	LESA	0	0	0
BASA	0	0	0	LESC	191.4	336.8	0.011
BBPL	0	0	0	LEYE	0	0	0
BCNH	1.1	2	0	MAGO	59	2440.4	0.003
BLTE	0.8	1.4	0	MALL	463.7	736.3	0.026
BNST	923	1245.4	0.051	NOPI	652.3	1589.7	0.036
BUFF	2.7	4	0	NSHO	290.3	3857.6	0.016
BWTE	0	0	0	PBGR	0	0	0
CAEG	0	0	0	RBGU	305.8	433.1	0.017
CAGO	1060.4	1726.6	0.059	REDH	160.5	3045.2	0.009
CAGU	3052.6	3969.2	0.17	RNPH	0	74.3	0
CANV	10.7	16	0.001	RUDU	78.5	101.4	0.004
CATE	2.7	5.1	0	SACR	6.1	10.3	0
CITE	496.6	756.6	0.028	SAND	0	0	0
CLGR	0.2	0.8	0	SNEG	44	73.1	0.002
COGO	10.3	18.8	0.001	SNPL	0	0	0
DCCO	7.5	19.4	0	SPSA	0	0.3	0
EAGR	56.1	190.6	0.003	WEGR	2.3	4.9	0
FOTE	65.8	182.6	0.004	WESA	0	0	0
FRGU	5255.7	9694	0.293	WFIB	5147	8973.1	0.287
GADW	625.7	7354	0.035	WILL	47.4	86	0.003
GBHE	2.3	4	0	WIPH	1749.1	3777.4	0.097

40 Magcorp

Description: This area runs along the Magcorp (now US Magnesium Corporation of Salt Lake City) dike road from the west GSL shoreline to Badger and Stansbury islands. Pond 1N designates Magcorp's solar pond "1 North." It is the first pond to receive brine from GSL and has approximately twice the salinity of the lake. The survey is conducted by driving the 11-mile length of the dike (western margin to Stansbury Island) and counting birds on the south side to the distance where species may be identified. Pond 0 designates the portion of GSL immediately north of the Magcorp dike and is the source of water drawn into Magcorp's solar ponds. Birds are counted on the north side, along the length of the dike. There is no public access.

Primary Habitat: Rocky Shorelines and Levees; Saltwater Shorelines, Beaches and Playas

Area Size (ha): 752.0

Estimated Area Covered by Survey (ha): 752.0

Years Surveyed: 7

Detection Rates: Visibility is generally good.

Species	Mean	Peak	Birds/ha	Species	Mean	Peak	Birds/ha
AGWT	0.7	2.2	0.001	GRYE	0	0	0
AMAV	632.2	1121.7	0.841	KILL	0.4	1.4	0.001
AMCO	0	0	0	LBCU	1.2	2.3	0.002
AMWI	0	0	0	LBDO	0	0.2	0
AWPE	0.1	0.2	0	LESA	90.3	267.7	0.12
BASA	82.2	141.1	0.109	LESC	0.6	1.2	0.001
BBPL	0.1	0.2	0	LEYE	0	0	0
BCNH	0	0	0	MAGO	0	2.8	0
BLTE	0	0	0	MALL	0.2	0.5	0
BNST	0.9	2.1	0.001	NOPI	0	0	0
BUFF	0	0	0	NSHO	0	1.2	0
BWTE	0	2.3	0	PBGR	0	0	0
CAEG	0	0	0	RBGU	0	0	0
CAGO	0.2	1.8	0	REDH	0	0	0
CAGU	3397.4	8989.3	4.518	RNPH	0	0	0
CANV	0	0	0	RUDU	1.8	2.2	0.002
CATE	0	0	0	SACR	0	0	0
CITE	0.1	0.3	0	SAND	2.7	5.4	0.004
CLGR	0	0	0	SNEG	0	0	0
COGO	0	0	0	SNPL	7.5	24.8	0.01
DCCO	0	0	0	SPSA	0	0	0
EAGR	3.1	735.3	0.004	WEGR	1.5	5.3	0.002
FOTE	0	0	0	WESA	247.7	539.7	0.329
FRGU	2.5	7.5	0.003	WFIB	0.2	0.3	0
GADW	1.8	3.8	0.002	WILL	0.3	1.7	0
GBHE	0.2	0.8	0	WIPH	1272.3	2626.7	1.692

*41 New State Duck Club**

Description: The area is within property boundaries of New State Inc., bounded by the outer dike on the north, the east channel, Margetts Dike on the south and the Salt Lake City Sewage Canal on the west. A total count is made during travel on the canals, and at ponds along the route.

Primary Habitat: Freshwater Wetlands

Area Size (ha): 1,200.2

Estimated Area Covered by Survey (ha): 600.1

Years Surveyed: 8

Detection Rates: Visibility is not good. There is much emergent vegetation obstructing vision, and some ponds are very large with difficult viewing distances. Counts from this area are very conservative.

Species	Mean	Peak	Birds/ha	Species	Mean	Peak	Birds/ha
AGWT	1151	2776.8	1.918	GRYE	4.5	11.3	0.007
AMAV	300.9	327.7	0.501	KILL	6.9	11.7	0.011
AMCO	835.4	1317.6	1.392	LBCU	1	1.9	0.002
AMWI	52	148	0.087	LBDO	433.7	825.1	0.723
AWPE	192.4	225.8	0.321	LESA	0.2	0.6	0
BASA	0	0	0	LESC	544.1	784.7	0.907
BBPL	0	4.6	0	LEYE	7.8	22.5	0.013
BCNH	20.5	39.7	0.034	MAGO	0.4	8.2	0.001
BLTE	49.4	114.8	0.082	MALL	1727.7	3184.2	2.879
BNST	105.7	131.7	0.176	NOPI	740.1	1642.5	1.233
BUFF	7.4	11	0.012	NSHO	525.2	1347	0.875
BWTE	2.6	5	0.004	PBGR	32.5	42.7	0.054
CAEG	0	0	0	RBGU	1.6	4.6	0.003
CAGO	104.9	143.9	0.175	REDH	123.7	203	0.206
CAGU	53.8	117.2	0.09	RNPH	0	0	0
CANV	4.4	5.3	0.007	RUDU	494.4	700.3	0.824
CATE	1.1	2.4	0.002	SACR	1.1	2	0.002
CITE	772.8	1705.8	1.288	SAND	0	0	0
CLGR	0.3	1.5	0	SNEG	79.7	96.8	0.133
COGO	0.4	0.7	0.001	SNPL	7	35.1	0.012
DCCO	17.5	23.3	0.029	SPSA	0.3	0.6	0
EAGR	16	178.8	0.027	WEGR	3.2	10.2	0.005
FOTE	41.5	71.3	0.069	WESA	9.9	17	0.016
FRGU	139.4	232	0.232	WFIB	295.2	352.3	0.492
GADW	1485.6	3032.6	2.476	WILL	8.6	15.2	0.014
GBHE	26	39.1	0.043	WIPH	17.2	43.3	0.029