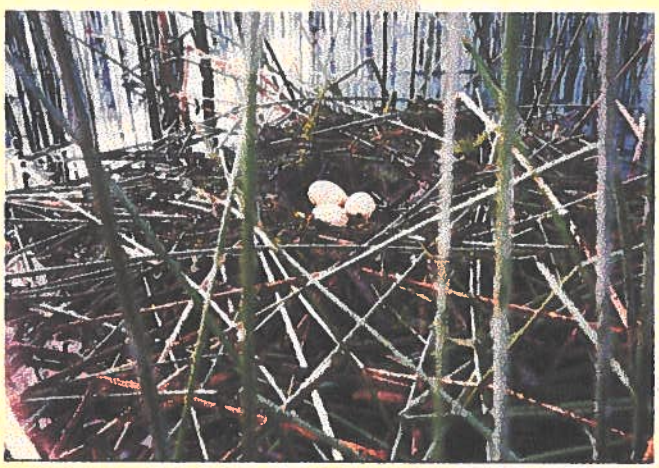
Lesser Slave Lake Important Bird Area

IMPORTANT BIRD AREAS OF CANADA

LES ZONES IMPORTANTES POUR LA CONSERVATION DES OISEAUX AU CANADA

2002 Lesser Slave Lake Western Grebe Survey



Summer 2002

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2012 Lesser Slave Lake Western Grebe Survey

Summer 2012

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1.0 Abstract

The Western Grebe (*Aechmophorus occidentalis*) occurs in globally significant numbers on Lesser Slave Lake. During the summer of 2002, the Lesser Slave Lake Bird Observatory (LSLBO) studied Western Grebe colonies on Lesser Slave Lake as a beginning to long-term monitoring. As part of the Lesser Slave Lake Region Important Bird Area Conservation Plan, the LSLBO hopes to follow the Western Grebe population, gain valuable information about their ecology on Lesser Slave Lake and monitor the threats to their survival.

Two Western Grebe colonies were located at previously active sites. A colony in Auger Bay contained an estimated 200 nests. In the other colony, which is near to Joussard, 1,463 nests were counted and an estimated 208 nests were missed. Using the maximum breeding populations of the two colonies together, there were an estimated 3,742 breeding Western Grebe adults on Lesser Slave Lake the summer of 2002.

No new colonies were discovered; however, many historic colonies and suitable habitat sites were surveyed, so it is possible that there are more colonies. The LSLBO also began a database of Western Grebe sightings and assessing the shoreline for quality of Western Grebe nesting habitat.

Results from surveying in summer 2002 confirm the global importance of Lesser Slave Lake to the Western Grebe species. It is vital that their habitat across the lake be protected and that threats to their survival be monitored. Lesser Slave Lake deserves our respect and stewardship for the Western Grebes nesting along the shorelines, and all the other aspects of its beauty.

2.0 Introduction

2.1 Purpose

The Lesser Slave Lake Bird Observatory (LSLBO) began surveying Western Grebes on Lesser Slave Lake in 2001 with the intention of following the status of the regional Important Bird Area (IBA) species. Lesser Slave Lake Region is designated as an IBA of Global Significance because 2% of North America's Tundra Swans stage on the lake, large Western Grebe colonies nest in emergent-zones along the lakeshore, and because of the impressive concentration of migrant songbirds in the region. That first summer Western Grebe sightings were recorded and a colony was discovered near Assineau.

In 2002, Western Grebe surveying was expanded and standardized to achieve several goals: estimate the number of breeding Western Grebe adults on Lesser Slave Lake, locate the Western Grebe colonies, identify possible threats to Western Grebes and their nesting colonies, and begin assessing nesting habitat for Western Grebes around the lakeshore.

Surveying Western Grebes will be continued in future years using the methods established in 2002. By following Western Grebes and their nesting colonies on Lesser Slave Lake, the LSLBO hopes to recognize sudden changes to their population, gain valuable information about their ecology on Lesser Slave Lake and monitor the threats to their survival.

2.2 Natural History of Western Grebes

The Western Grebe (*Aechmophorus occidentalis*) is a principally piscivorous diving bird, which rarely flies except to migrate. (Hanus *et al* 2002) They breed on lakes larger than 20ha in size with extensive beds of persistent emergent vegetation from Canada's prairie provinces to southwest

USA and locally in regions of Mexico. (Short 1984) They winter in sheltered bays along the Pacific Coast from southern British Columbia to southern Baja California. (Short 1984) Western Grebes nest colonially in moderately dense emergent vegetation. They show a strong preference for expansive, continuous sections of bulrush (*Scirpus* sp.). (Hanus *et al* 2002)

In Alberta, which covers 39% of their range in Canada, the Western Grebe is uncommon (less than 1000 breeding occurrences) and listed as a "sensitive species" (Alberta Environment 2002). (Fraser 2000) Due to their colonial nature, single and localized events can be catastrophic to entire Western Grebe populations. (Hanus *et al* 2002) Natural threats include water level fluctuations, wind storms, egg predation and disease. (Hanus *et al* 2002) Many human activities also threaten Western Grebes: emergent vegetation clearing, wave and noise disturbance from boats, agriculture and livestock near the shoreline, sport fishing (principally due to the fish species introductions) and water pollution are pertinent examples. (Hanus *et al* 2002) The principle threat to Western Grebes last century, however, was the loss of nesting habitat due to shoreline development. (Fraser 2000)

2.3 Ecology of Western Grebes on Lesser Slave Lake

The Important Bird Area Scientific Committee (2000) reported that the Lesser Slave Lake Western Grebe population is globally significant. Essentially, the health of Western Grebes on this lake has an effect on the status of the entire species. Provincially, Lesser Slave Lake has one of the largest concentrations of Western Grebes in Alberta. (Chabaylo and Knight 1997)

Two colonies of Western Grebes were known to be active in 2001 and several historic colonies have been reported. Hanneman and Heckbert (2001) estimated 350 nests at the Near-Joussard colony using aerial methods in 2000. Christine Boulton reported an active colony in Auger Bay in 2001. Historical reports are of an active colony near Widewater from the 1960s, 400 nests around Assineau Point from 1979, 50 nests in Giroux Bay in 1979 and 485 nests around Driftpile Point in 1978. (Ealey 1986)

Besides these occasional reports of Western Grebe activity on Lesser Slave Lake, little is actually known about their ecology. What is the site fidelity for the colonies? Do colonies have distinct feeding areas? What unique threats and limiting factors exist?

Beginning in Summer 2002, the LSLBO is attempting to research the accurate number of Western Grebes on Lesser Slave Lake, discover the location of all major colonies and follow their success over time.

3.0 Methods

The 2002 Western Grebe survey consisted of four parts: sightings, colony reconnaissance, nest counts and habitat assessment. These methods are summarized from Procedures for Monitoring Western Grebe Colonies in the Lesser Slave Lake Important Bird Area. (Appendix A)

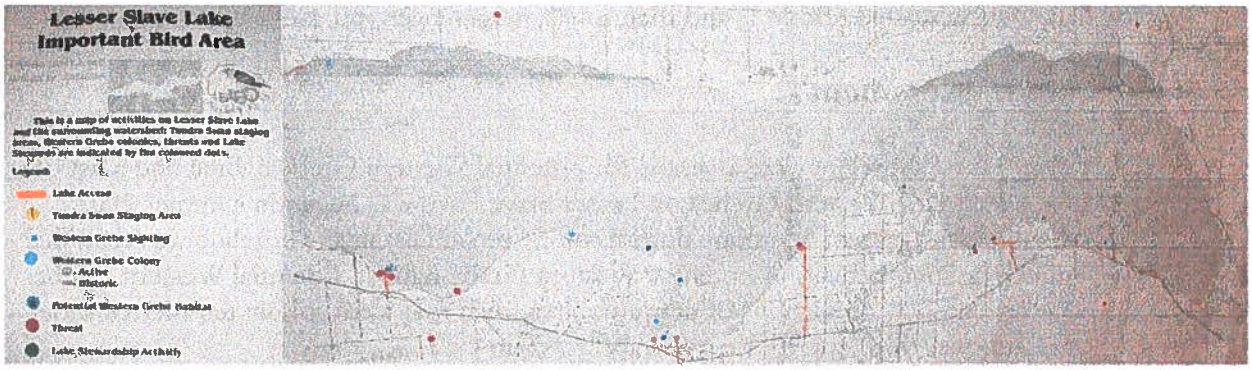
3.1 Sightings

Whenever out on the lake, the LSLBO Conservation Educator watched for Western Grebes. From shore, a zoom 15-25x scope was used. From the kayak, and on one occasion a powerboat, hand held binoculars (either compact 7x26, or 8.5x44) were used.

The LSLBO bird banders record all waterfowl sighted or heard from shore in front of the Bird Observatory. They were asked to report Western Grebe sightings for this survey.

Sightings were recorded and mapped on the Lesser Slave Lake Important Bird Area Map, located in the hallway outside the LSLBO office. (Figure 1)

Figure 1. Lesser Slave Lake Important Bird Area Map



3.2 Colony Reconnaissance

Both known Western Grebe colonies were scouted by kayak to find the accurate nesting location. Upon locating the colony, chest waders were used to wade through and estimate the number, state of activity and layout of the Western Grebe nests.

Kayak trips were also made in front of the Bird Observatory on June 13, from Marten River Campground to Marten River on July 1, around Auger Bay and out to Swan Point on July 9, in the area around the Near-Joussard colony on July 11, in front of Hilliard's Bay provincial Park on July 12, from the bridge on Secondary Highway 750 to the mouth of Heart River also on July 12, and finally around Giroux Bay on August 22. On those occasions, evidence of Western Grebe colonies (such as bird sightings near the reeds, nests, and grebe chicks) was sought.

An attempt to powerboat from Spruce Point Park through the narrows and into Gimlet Bay was made on July 19, however, rain and lightning prevented launching and no other opportunity arose to make the trip.

3.3 Nest Counts

Once Western Grebe Colonies were located, they were counted using nest count methods suggested by Stephen Hanus, Wildlife Biologist with Alberta Fish and Wildlife in Stony Plain.

The Auger Bay colony was counted by one person, wading through and recording all nests encountered. Total nests were estimated from that count.

A complete count was attempted for the Near-Joussard colony. A team of 6 counters, spaced roughly 5m apart, traversed back and forth through the length of the colony starting on the outside and moving towards shore. On the inside of the line, flagging tape was tied to bulrush reeds to keep the team straight. Nests close to the flag line were marked by tape once they had been counted. Counters recorded nests only to their right or left (whichever was on the outside) so that all nests encountered by the team were counted and none were double-counted. The person on the outside (the edge already counted) removed all the flagging tape and did not count nests so that they did not slow down the line.

Nests were counted as either active, intact, partially submerged, or submerged (see Appendix A.) Active nests contained either a number of eggs, chicks, dead chicks, shell fragments, hatched eggs, predated eggs, or in some cases a combination. The count team also kept track of discarded eggs and chicks not associated with nests, as well as other bird nests. This information, as well as start/finish times, conditions, and habitat characteristics were recorded on individual data sheets. (Appendix B)

The data were tabulated (Table 1) and then totals, percentages and averages were analysed.

3.4 Habitat Assessment

A few sections of shoreline were assessed for potential Western Grebe habitat and a list of threats to the survival of Western Grebes on Lesser Slave Lake was begun in summer 2002.

Littoral habitat assessment was done during colony reconnaissance. Shoreline was classified as either unlikely nesting habitat, or potential Western Grebe habitat. Potential Western Grebe habitat was considered to be sections of continuous bulrush that were at least ten metres wide (from shore) and over thirty metres long (parallel to shore).

A 1980 shoreline survey map, showing emergent vegetation cover, was also used to locate other possible areas of potential Western Grebe nesting habitat. Historic colony sites listed by Ealey (1984), were also considered to be potential habitat.

Sections of shoreline where there was potential habitat were noted and marked on the Lesser Slave Lake Important Bird Area Map. (Figure 1)

A short list of activities known to possibly impact Western Grebes was compiled. Activities considered possible threats include shoreline cattle grazing and boating. These activities were also mapped where observed.

4.0 Results

Counts from two located colonies confirm the globally significant presence of Western Grebes on Lesser Slave Lake. Eight sightings over the summer and short stretches of assessed shoreline gathered in summer 2002, begin a database that will enable the LSLBO and others to follow the success of Western Grebe populations on Lesser Slave Lake over time.

4.1 Sightings

Western Grebes were sighted eight times.

1. 25 WEGR floating in open water near Persson's RV Park. (Gordon Eadie – shore – May 8, 2002.)
2. 12 WEGR feeding near fish nets in open water off Auger Bay. (Gordon Eadie – powerboat – June 2, 2002.)
3. 31 WEGR swimming out from Auger Bay. (Gordon Eadie – kayak – July 9, 2002.)
4. 200 WEGR fleeing the Near-Joussard Colony. (Gordon Eadie – kayak – July 11, 2002.)
5. 27 WEGR near shore by the Near-Joussard Colony. (Jul Wojnowski and George Livingston – wading – July 17, 2002.)
6. 60 WEGR in the open water off the Bird Observatory. (LSLBO – shore – early August 2002.)

7. 16 WEGR in the open water off the Bird Observatory. (LSLBO – shore – August 18, 2002.)
8. 1 WEGR near shore in Giroux Bay (Gordon Eadie – kayak – August 22, 2002.)

4.2 Colony Reconnaissance

The Auger Bay colony was not located at first from the kayak and was only discovered when chest-wading through the bulrush the following day (July 10). It was found 1.1km along the shoreline from Assineau boat launch. The Auger Bay colony was not distinctly in one stand of bulrush, but rather several groupings of nests were found within a larger somewhat semi-discontinuous area of emergent vegetation along a kilometre of shoreline.

Conversely, the Near-Joussard colony was easily located. It was visible out towards the rocky spit from the near-Joussard boat launch because hundreds of Franklin's Gulls and Common Terns were flying overtop. (Figure 2) The colony was spread out in a large area of bulrush. There were other colonial nesters at the same site. Eared Grebe nests were scattered throughout, but became more numerous closer to the boat launch. (Appendix C) Franklin's Gulls nested on the rocky spit and on floating mats in the bulrush. American Coots were also nesting throughout.

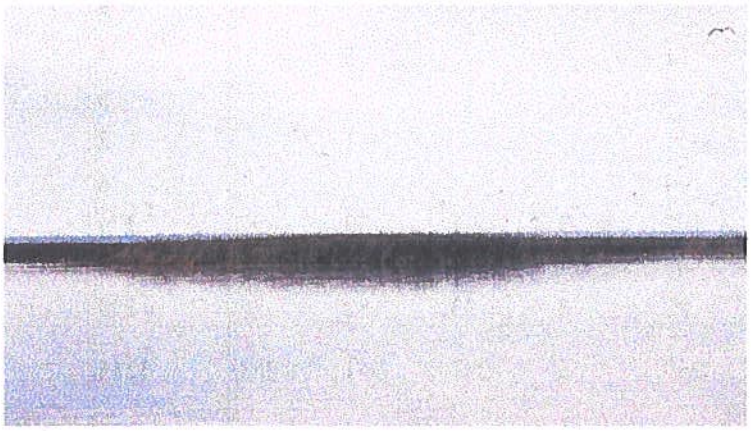


Figure 2. Near-Joussard Colony from the water.

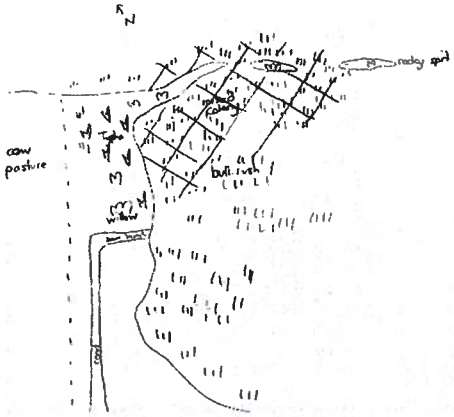


Figure 3. Near-Joussard Colony Map.

4.3 Nest Counts

Only one complete nest count was conducted in 2002. The number of nests in the Auger Bay Colony had to be estimated because the nests had already been abandoned by the time the colony site was located. There were approximately 200 nests. A complete nest-count was attempted at the Near-Joussard colony on July 17 and yielded 1,463 Western Grebe nests, plus another estimated 208.

4.3.1 Auger Bay Colony

When the Auger Bay colony was located on July 10, the nests had already been abandoned for the summer. By chest wading through the colony site, the number of nests for this year was estimated at 200. 71 nests were actually counted. Although the state of each nest was not recorded, overall observations were taken. Most nests were already fully submerged, though some partially submerged nests contained egg-fragments. Three active grebe nests were found, possibly Red-necked Grebe, as two of those nests were outside the

areas of the Western Grebe colony. Other evidence of this year's Western Grebe colony included feathers and a dead adult.

4.3.2 Near-Joussard Colony

The team counted 1,255 Western Grebe nests in two-thirds of the Near-Joussard colony. (Table 1) At that point, the team had been in the colony for over two hours, so the complete count method had to abandoned. On the way back to shore, the team spread out through the remaining bulrush and recorded all nests encountered. Another 208 nests were counted this way, and the team safely estimated encountering only half the remaining nests.

Table 1. Near-Joussard colony complete count.

Nest	Category	Cedar	Gordon	Aaron	Monica	Jul	Geroge	Count	After End
Active	With 1 Egg	9	11	1	8	20	9	**58**	12
	2 Eggs	17	29	7	29	38	28	**148**	5
	3 Eggs		2		1	4	3	**10**	
	With Hatched Eggs	2					1	**3**	3
	With Predated Eggs	2	1			5		**8**	
	Egg Fragments	1	2	1			1	**5**	1
	With Chicks		1			1		**2**	
	With Dead Chicks	2	4					**6**	
Innactive	Intact	42	102	3	91	39	97	**374**	73
	Partially Submerged	44	85	20	75	172	46	**442**	81
	Submerged	21	22	3	33	82	38	**199**	33
	Total	140	259	35	237	361	223	**1255**	208
									TOTAL
									1463

Of the 1,255 nests counted using complete methods, 236 were active. (Table 2) Most active nests contained two eggs (Table 1) and in all, 384 eggs were counted. (Table 2)

Table 2. Nest activity totals

Total	Count
Eggs	384
Hatched Eggs	7
Predated Eggs	8
Chicks	39
Dead Chicks	21
Adults	27
Dead Adults	1
Discarded Eggs	14
Nests	1463

4.4 Habitat Assessment

4.4.1 Potential Western Grebe Nesting Habitat

The following areas were noted as potential Western Grebe nesting habitat.

1. Near Widewater: historic colony, no numbers during 1960s. (Ealey 1986)
2. Giroux Bay: historic colony, 400 nests during 1970s (Hanneman and Heckbert 2001); 50 nests in 1979 (Ealey 1986).
3. Assineau Point: historic colony, no numbers for 1978; approx. 400 nests in 1979. (Ealey 1986)
4. Driftpile Point: historic colony, 485 nests May 1978; 200 nests July 1979. (Ealey 1986)
5. Eastern Hilliard's Bay Provincial Park: Frank Fraser identified the shoreline as an area of good emergent habitat in summer 2002. A kayak survey of the area showed that it could be classified as potential habitat (Gordon Eadie – July 12, 2002).
6. Giroux Bay: Based on the 1980 Map of the West Basin, Showing Depth Contours, Sampling Sites and Shoreline Profile Sites.
7. Driftpile Point: Based on the 1980 Map of the West Basin, Showing Depth Contours, Sampling Sites and Shoreline Profile Sites.
8. Gimlet Bay: Based on the 1980 Map of the West Basin, Showing Depth Contours, Sampling Sites and Shoreline Profile Sites.

4.4.2 Possible Threats to Western Grebe Survival

The following possible threats to the survival of Western Grebes on Lesser Slave Lake were observed.

A. Grazing of the emergent vegetation along the shoreline immediately east of the near-Joussard Western Grebe colony. The grazing poses an immediate threat to the water quality of the shoreline and has destroyed shoreline vegetation. (Figure 4)

Figure 4. Cow pasture beside Near-Joussard colony.

B. The Joussard boat launch is in the middle of an expanse of emergent vegetation. Boats launching and docking go through the bulrush and very near to the nesting site of the near-Joussard colony. Continuous wave, noise and sight disturbance are known threats to the nesting success of Western Grebes. Boats may also damage bulrush stands and cause a retreat of emergent vegetation. (Figure 5)
C. Private marina in Joussard Bay.
D. Lots of boat activity in Giroux bay from the Faust marina creates constant wave, noise and sight disturbance close to the historic Giroux bay Western Grebe colony.
E. Spruce Point Marina.

F. Grazing along the shoreline and into the emergent vegetation at the site of the Auger Bay Western Grebe Colony. (Figure 6)

Figure 5. Near-Joussard boat launch.

Figure 6. Grazing near the Auger Bay colony.

G. The Auger Bay (Assineau) boat launch is 1.1 km down the shoreline from the Western Grebe Colony.
H. Grazing lease along the shoreline in Giroux Bay.
I. Canyon Creek marina.

5.0 Discussion

5.1 Sightings

Not enough effort has been put into sightings to derive any useful information so far. A continued database of Western Grebe sightings in the years to come will, however, provide insight into what locations they are most commonly encountered. A greater effort, including standardized procedures is necessary to answer specific ecological questions.

Nonetheless, the sightings are still useful towards understanding the Western Grebe population on Lesser Slave Lake. The lake was still mostly covered by ice until the fourth week of May. Western Grebes sighted off Persson's RV Park on May 8 could have been staging migrants or resident breeders that were restricted by the limited open water. Dave Derosa, Wildlife Biologist with Alberta Fish and Wildlife in Slave Lake noted that Western Grebes are very often seen feeding around fishnets in the open waters off Auger Bay. Indeed, a group was seen feeding there on June 2 during the one powerboat survey.

Western Grebes sighted in Auger Bay on July 9 support the activity of that colony this summer. The lone Western Grebe seen in Giroux Bay adds another reason to do reconnaissance in the historic colony there next year. At the same time, though, it is not an important sighting because it was alone and it was seen too late in the season. Sightings from the bird observatory in August may suggest that Western Grebes travel farther to feed after abandoning the colonies.

5.2 Colony Reconnaissance

Colony reconnaissance was not done early or extensively enough. More effort needs to be made in June 2003 to kayak to areas of historic colonies and sections of shoreline where decent emergent vegetation might be found. Whenever possible, UTM locations need to be taken by GPS and entered into a database.

Lesser Slave Lake is extremely large and so there are many added challenges to locating colonies. It is hoped, however, that over the nest few summers, the entire south shore and areas of the north shore can be closely surveyed. Only then, will it be known if there are other Western Grebe colonies on Lesser Slave Lake.

5.3 Nest Counts

Assuming that a pair of breeding Western Grebes will build exactly one nest, the maximum breeding population for Lesser Slave Lake is 3,742. This population estimate is based on the nest counts of the two known colonies.

5.3.1 Auger Bay Colony

By doubling the nest count estimate, the maximum breeding population for the Auger Bay colony for the summer of 2002, is estimated at 400. However, there is slight confidence in this figure because the number of nests was also an estimate.

That the nests had already been abandoned by July 10 is also of concern, especially considering that most nests were already partially or fully submerged. From Stephen Hanus' research in the Stony Plain area, it takes a week or two for Western Grebe nests to deteriorate. This would suggest that the nests in Auger Bay had been abandoned by the end of June, which would be very early for the colony to have fledged their young.

Therefore, the success of the Auger Bay colony should be questioned. Damage to the emergent vegetation caused by cattle and boat activity in the bay from the nearby boat launch are of concern. Perhaps, though, the Auger Bay colony was simply quick to fledge their young this summer.

Regardless, the Auger Bay colony should be closely monitored in summer 2003. Observations made next year could very well provide insight into the success of the colony in summer 2002.

5.3.2 Near-Joussard Colony

The Near-Joussard colony was very large, containing an estimated total of 1, 671 Western Grebe nests. (Table 3). Using the estimated total, the maximum breeding population for the Near-Joussard colony is 1, 671. (Table 4) This figure is thought to be very reliable and quite accurate because the complete nest count method was used on most of the colony. It is possible that this figure would higher had the team been able to completely count the entire colony.

Table 3. Counted, estimated uncounted and total nests in the Near-Joussard colony.

Western Grebe Nests	
Counted	1,463
Estimated uncounted	208
Estimated total (counted+uncounted)	**1,671**

Only the activity of those nests counted using complete methods was analysed. This represents about two thirds of the total estimated Western Grebe nests in the Near-Joussard

colony. On July 17, 19.1% of the nests were still active, which is double the target value of 10% activity for the complete nest count. (Table 5) In future years, the state of nests should be more carefully determined during reconnaissance to avoid disturbing so many active nests.

Table 4. Maximum WEGR breeding population in the Near-Joussard colony.

Nest Count	Total	Adults	Max.
WEGR total count	1,255	27	2,510
WEGR after count	208	27	2,926
WEGR estimate	208	27	**3,342**

Table 5. State of WEGR nests in the Near-Joussard colony.

1225 Total Nests	#	percentage (%)
Active Nests	240	19.12
Nests with eggs	216	17.21
Innactive Nests	1015	80.88
Intact Nests	374	29.80
Partially submerged	442	35.22
Submerged Nests	199	15.86

Counters tended to vary how they classified the inactive nests. Jul counted fewer active nests than the other counters, whereas, Gordon and George counted more intact nests. (Table 1) This variation is not thought to be very problematic but effort should be taken is future counts to keep the team consistent. The number of nests encountered during the complete count was fairly constant between counters. (Table 1) Fewer nests counted by Cedar and Aaron is due to them being on the outsides, in charge of flagging. Jul also began recording nests counted by Aaron. By taking the 140 nests counted by Cedar, subtracting the 35 Aaron recorded and subtracting that 105 from Jul's total, Jul actually counted about 256 nests, which is on par with what Gordon, Monica and George counted.

The average active Western Grebe nest in the Near-Joussard Colony contained 1.60 eggs. (Table 6) It would be interesting to know how this compares to the average egg count during the peak of nesting activity. An average of 0.16 chicks per nest includes all chicks, most of which could not be associated with nests. This average might also indicate that most of the 2002 chicks were with their parents, which is encouraging. Other averages, such as predated eggs per nest, although interesting for the count, do not reveal much about actual figures for the colony during peak activity.

Table 6. WEGR nest activity in the Near-Joussard colony.

236 Active Nests	total	average/nest
Number of eggs	384	1.60
Chicks	39	0.16
Hatched Eggs	7	0.03
Predated eggs	8	0.03
Dead Chicks	21	0.09

5.4 Habitat Assessment

Although, easy to attempt while doing reconnaissance, classifying shoreline as potential Western Grebe nesting habitat versus unlikely nesting habitat is not cut and dry. There are likely many poorly or not at all understood variables regarding colony site location. It is particularly difficult to determine how disturbances affect otherwise potential nesting habitat.

Those locations identified as potential nesting habitat for Western Grebe colonies in 2002 are more so places to look during future reconnaissance, rather than alternative sites for existing colonies. Although an inventory of kilometres of shoreline where there is of continuous bulrush at least ten metres wide and over thirty metres long would be useful information, that cannot be assumed to indicate kilometres of shoreline available to Western Grebes for nesting. With that in mind, and from what is already known, there are few potential nesting sites on Lesser Slave Lake for Western Grebes considering its size and fish population. Therefore, sections of shoreline with continuous emergent vegetation are at a premium for Western Grebes, as well as many other species that depend on such habitat. For the health of the lake ecosystem, it is important that such productive shorelines be protected from human impact.

Threats to Western Grebe populations on Lesser Slave Lake were not studied in depth during summer 2002. The threats listed are real, yet they are not well understood and are certainly not inclusive. Further research into existing threats would be most valuable. An understanding of those threats would help guide stewardship practises that could reduce the threat of human activity to Western Grebes on Lesser Slave Lake.

5.5 Summary

Two colonies of on Lesser Slave Lake support a maximum breeding population of 3,742 Western Grebes. In the Near-Joussard colony alone, there are more Western Grebes than on Lac St. Anne, Wabamum Lake and Isle Lake combined. Hanus *et al* (2002) estimated 2,570 Western Grebes on those three lakes, and found no other nesting populations in the Stony Plain region.

In order to discover the true Western Grebe population of Lesser Slave Lake, increased effort needs to be made in future years to find other colonies. A database of sightings and an inventory of potential nesting habitat started in summer 2002 will be useful in gaining an understanding of the ecology of Western Grebes on Lesser Slave Lake if it is continued in the years to come.

It is known with certainty that Lesser Slave Lake is important to Western Grebe populations globally. Therefore, it is important that the threats of human activities around the lake to the survival Western Grebes be understood to guide stewardship of their habitat and of the entire lake ecosystem.

6.0 Recommendations

Many lessons were learned in summer 2002 that can hopefully help surveying in future years. The following recommendations address those lessons, as well as other helpful ideas or information that came out of the work done this season.

6.1 Survey Recommendations

1. Lake access points are few and far between. They can also be difficult to locate. Do not underestimate the challenge of finding launch sites.
2. Powerboat trips will be necessary to visit many of the more remote locations; or alternatively, overnight kayak trips could be made. If it is possible to be dropped off by a powerboat in the kayak, that is another alternative.
3. Have chest waders to wade through sections of possible nesting habitat.
4. Reconnaissance must be completed in June.
5. Monitor colonies closely by visiting the colony once a week starting at the beginning of July so as to better approximate the time when there is only 10% activity.
6. Map out the colonies accurately before the nest counts to guide strategy.
7. Be prepared for nest counts anytime in July.
8. For the Near-Joussard colony, use a boat to get out to the rocky spit at the beginning of the count. Be sure to have 6-9 people to complete the nest count there because it is so large. Also, consider developing methods to count only a portion of the colony if a complete count is again impractical.
9. UTM locations of colonies, potential habitat and sections of shoreline assessed for habitat should all be taken by GPS whenever possible.
10. Contact the airport and the forest service first thing in May about possible free flights to survey the lake. Talk to Mark Heckbert, Wildlife Biologist with Alberta Fish and Wildlife, about appropriate procedures.
11. Talk to Leanne Osokin with the Alberta Conservation Association (ACA) about habitat assessment. ACA will be doing a shoreline use survey around Lesser Slave Lake in 2003. This provides an excellent opportunity to scout the lake and share information.
12. A guide to nests and nestlings would be useful to identify other species encountered during the nest counts.
13. Make sure that the LSLBO bird banders are aware that all Western Grebe sightings are useful.
14. Locate other individuals to watch for Western Grebes and report numbers, activity and locations of all sightings.

6.2 Management Recommendations

1. Produce signs about the natural history and conservation of Western Grebes for lake access points and view points. Use the design produced by Stephen Hanus, Wildlife Biologist with Alberta Fish and Wildlife, for the Stony Plain region. A digital image of the signs Stephen produced is located in the Sings folder in My Documents on the education computer in the LSLBO office.
2. Locate a steward to monitor the threats to each Western Grebe colony and have them participate in the nest count. Have them keep track of activity around the colony site as well. Be certain they will not disturb the colony.
3. Talk to commercial fishermen to determine what threat nets pose to feeding Western Grebes. A voluntary reporting system might make it possible to estimate the effect all the fishing season.
4. Liase with government and non-government groups to share information and resources as much as possible.

7.0 Conclusion

Western Grebe surveying on Lesser Slave Lake in summer 2002 proved the importance of Lesser Slave Lake to the global Western Grebe population. There were an estimated 3,742 breeding adults in summer 2002.

Unfortunately, many human activities around the lake threaten the future of Western Grebes on Lesser Slave Lake. Researching what all those threats are and the dangers they pose is important to guide management and stewardship of the lake ecosystem.

Surveying done in summer 2002 is a first step in long term monitoring of Western Grebes. Studying Western Grebes on Lesser Slave Lake through time will provide information about their ecology and help the understanding of how humans impact their survival. Furthermore, because Western Grebes are excellent indicators of the health of fish-bearing lakes, and the availability of undisturbed, intact littoral habitat, following their success over time will reveal the ecological health of the Lesser Slave Lake. (Hanus *et al* 2002) Protecting Western Grebes and their habitat would benefit whole lake ecosystem and help to ensure the future beauty and productivity of Lesser Slave Lake.

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Appendix A. Procedures for Monitoring Western Grebe Colonies in the Lesser Slave Lake Important Bird Area.

Gordon Eadie, LSLBO Conservation Educator. Summer 2002.

Objective

The goal of monitoring Western Grebe colonies on Lesser Slave Lake is to provide a better understanding of the number of breeding adults on Lesser Slave Lake, discover the locations of colonies and track their success over time and, assess the amount and quality of Western Grebe habitat. Threats to Western Grebes and their habitat will also be determined and monitored. This information will be shared with Alberta Fish and Wildlife, as well as other government and non-government agencies and used to guide the Lesser Slave Lake Important Bird Area Conservation Plan.

Monitoring Program

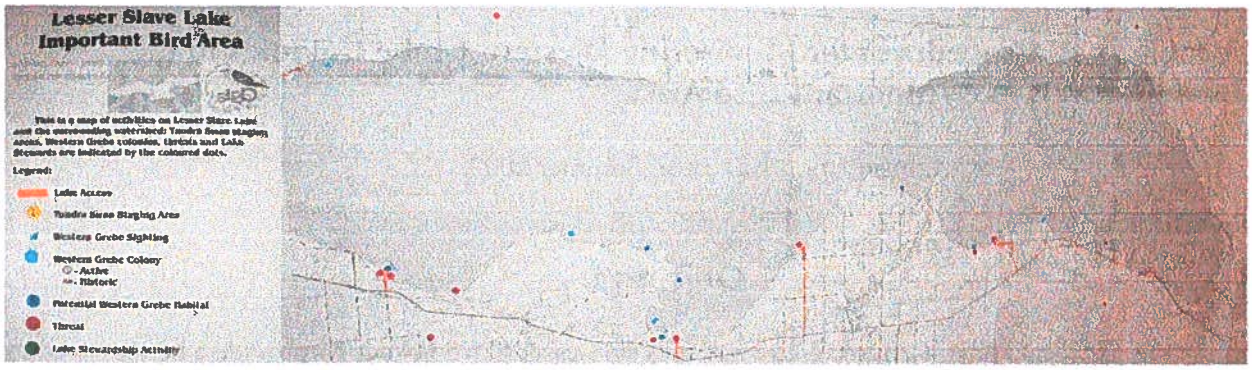
The monitoring program will entail recording Western Grebe sightings, surveying Lesser Slave Lake for Western Grebe colonies, making yearly nest counts of known colonies immediately following abandonment, classifying the littoral zone for potential nesting habitat, as well as identifying and assessing anthropogenic threats to the survival of Western Grebes on Lesser Slave Lake.

Lesser Slave Lake Bird Observatory (LSLBO) will coordinate the monitoring program and fundraise for a seasonal Conservation Educator (CE), who will study Western Grebes on Lesser Slave Lake during their summer employment. LSLBO has acquired equipment necessary for monitoring including a Bausch & Lomb zoom 15-25x scope, Swift 8.5x44 binoculars, a fully equipped kayak, a digital camera and a computer for use by the CE. The CE will keep a computer database and produce reports every summer detailing their work and findings.

Western Grebe Sightings

Creating a database of Western Grebe sightings will reveal at which locations they are most likely to be encountered. All Western Grebe sightings should be documented by recording the date, number of birds, their activity, the location, the observer and how the observation was made. (e.g. 12 WEGR feeding near fish nets in open water off Auger Bay on June 2, 2002 seen by Gordon Eadie using binoculars from powerboat.)

A record of Western Grebe sightings, beginning with the summer of 2002, will be kept on the Lesser Slave Lake Important Bird Area (LSL IBA) Map Database. This database, kept on the LSLBO educator computer in the IBA folder, details points on the Lesser Slave Lake Important Bird Area Map that is in the hallway just outside the LSLBO office. This map is used to mark the approximate locations of activities (including sightings) on and around Lesser Slave Lake. Western Grebe sightings will be marked using blue quarter-circle stickers.



Lesser Slave Lake Important Bird Area Map

Whenever out on the lake or lakeshore, the CE will watch for Western Grebes. The scope will be used from shore; the binoculars will be used in the kayak. The CE should also attempt to organize free powerboat trips with Alberta Fish and Wildlife and aerial surveys with the Forest Service or other potential rides.

The LSLBO bird banders record all waterfowl sighted or heard from shore in front of the Bird Observatory. They will be asked to report Western Grebe sightings for this survey.

Finally, the CE should seek other individuals to make and report Western Grebe sightings. A database of sightings will eventually help to determine which lake locations are used by Western Grebes and for what purposes (e.g. feeding sites.)

Colony Reconnaissance

Every summer, during the month of June, the CE needs to do reconnaissance for the exact locations of current Western Grebe colonies as well as historic and possible new colonies. Active and historic colony sites are indicated by blue dots on LSL IBA Map. Previously discovered potential future nesting sites are also indicated on the map by starred blue dots. Useful lake access points are also highlighted on the map. The history of each colony site is kept on the LSL IBA Map Database. These data histories need to be kept up-to-date.

Active colonies receive the highest priority for reconnaissance, followed by historic sites, potential nesting habitat and lastly, unknown sections of shoreline should only be surveyed once the higher priority sites have been checked for activity. The 1980 Map of the East/West Basin, Lesser Slave Lake, Showing Depth Contours, Sample Sites and Shoreline Profile Sites (located underneath the LSL IBA Map in the hallway outside the LSLBO office) may be useful in determining what new areas should be checked.

Reconnaissance is done principally using kayak and chest waders. (Powerboat and aircraft can also be used when possible, and shoreline surveys may also help.) The CE should kayak a short distance out from the emergent vegetation and look for signs of colony activity. A sign of activity might be Western Grebe sightings near the emergent vegetation, parents with chicks, Western Grebe calls, flocks of associated colonial nester such as Common Terns of Franklin's Gulls over the emergent vegetation, or Western Grebe nests. When signs of activity are discovered, the CE should wade through emergent vegetation to verify the presence of a Western Grebe colony.

When colonies are located, the area where nests are found should be mapped out, a UTM location needs to be taken using a GPS (the LSLPP has a GPS available for LSLBO use) at the centre of the colony, and the nesting activity needs to be followed. To do so, the CE will count 20 or more nests within a five metre wide line and record the number of eggs, hatched eggs, predated eggs, and chicks. It is very important to be as quick as possible during counting and spend as little time around the colony as possible.

Counting may need to be repeated every ten days (or longer in between if appropriate) until at least 90% of the nests are no longer active (empty). This will likely happen around the third week of July.

Nest Counts

Once Western Grebe Colonies are located and are less than 10% active, they should be counted using complete methods suggested by Stephen Hanus, Wildlife Biologist with Alberta Sustainable Resource Development, Fish and Wildlife Division in the Stony Plain region. He can be contacted by phone at (780) 963-6131 ext. 248, or by email at stephen.hanus@gov.ab.ca. The complete nest counts need to be organized ahead of time by the CE.

A complete count requires a team of three or more counters, depending on the size and layout of the colony. Counters should be spaced roughly 5m apart in a line. They will traverse back and forth through the length of the colony starting on the outside and moving towards shore. On the inside of the line, flagging tape is tied to bulrush reeds to keep the team straight. Nests close to the flag line are marked by tape once they have been counted.

Counters record nests only to their right or left (whichever is on the outside) so that all nests encountered by the team are counted and none are double-counted. The person on the outside (the edge already counted) removes all the flagging tape and (depending on the number of counters) may not count nests or may have a smaller count space so that the count team can move as quickly as possible.

Counters should also be assigned secondary duties. There should be a person on either end of the line with flagging tape. Whoever is best at identifying birds should count birds sighted or heard. Someone should also take photographs. And finally, the CE should be available to answer questions and double-check questionable nests. Depending on how many counters are with the team, some duties can either be doubled up or repeated.

Nests should be counted as either active, intact, partially submerged, or submerged. Active nests contain either a number of eggs, chicks, dead chicks, shell fragments, hatched eggs, predated eggs, or in some cases a combination. A Western Grebe nest floats on the waters surface and is usually a metre or so in diameter. They are made mostly of bulrush (*Scirpus* sp.) reeds and may be lined with pondweed and down. Their eggs are white, though sometimes stained by the tannins in the water, and look like slender, elongated chicken eggs.
Intact Western Grebe nests are nests that appear the same in condition as active nests, except that they are empty. They should still have a slight build up in the middle, or crown,

where the eggs would have been. It is sometimes necessary to lift away a bit of vegetation to be certain an intact nest is empty, because Western Grebes will cover their eggs debris before fleeing the nest. Because of this, it is also good practise to stop for a moment just before entering the colony and allow straggling nesters a chance to conceal their eggs.

Active Western Grebe nest.

Submerged Western Grebe nest.

A partially submerged nest is one that has lost its crown and has begun to deteriorate. They begin to appear muddier and are not quite as wide or high in the water. Once most of the nest is underwater and looks more like an underwater floating mass of mud, algae and debris it should be classified as fully submerged. Nests tend to completely deteriorate within a week or two.

Eared Grebe nest

Western Grebe nests can be differentiated from other nests as follows. They are almost always constructed close together in a colony, while Red-necked Grebes are not colonial nesters and there nests and eggs are slightly smaller. Eared Grebe nests are much smaller, though may be interspersed with Western Grebe Nests. Eared Grebe nests and eggs are about half the size. Coot nests are similar in size to Eared Grebe nests, but much more woven and built up in the middle. Instead of white, coot eggs are softly speckled brown. Terns and gulls tend to nest on built up mats of bulrush or on the ground on shore.

American Coot nest

Franklin's Gull nesting mat

The count team should also keep track of discarded eggs and chicks not associated with nests, as well as other bird nests and notable discoveries. This information, plus the start/finish times, conditions, and habitat characteristics are recorded on individual data sheets. (Appendix B)

Littoral Habitat Assessment:

Western Grebes build floating nests colonially in persistent, extensive stands of emergent vegetation, which grow in the littoral zone along lakeshores or shallow areas of the lake.

Littoral habitat assessment can be done during colony reconnaissance, as well as later in the summer. Again kayaking will be the principal mode of transportation, but shoreline, powerboat and aerial surveys can also be done.

Sections of littoral habitat along the shoreline are to be classified as either unlikely nesting habitat, or as potential Western Grebe nesting habitat. Potential Western Grebe habitat is considered to be a section of continuous bulrush at least ten metres wide (from shore) and over thirty metres long (parallel to shore).

When an area of potential Western Grebe nesting habitat is found its UTM location should be taken using a GPS, its approximate location should be indicated on the LSL IBA Map using a starred blue dot, and it should be added to Map Database.

Potential Western Grebe nesting habitat should not be considered alternative sites for existing colonies. Although an inventory of potential habitat will be useful information, it cannot be assumed to indicate kilometres of shoreline available to Western Grebes for nesting.

Threats to Western Grebes

Human activities around Lesser Slave Lake that possibly impact Western Grebes need to be listed to help plan appropriate stewardship practices that can ensure their survival. Many human activities are known to threaten Western Grebes everywhere: emergent vegetation clearing, wave and noise disturbance from boats, sight disturbance from proximity to colonies, agriculture and livestock damage to shoreline and water quality, fish species introductions, fishing pressure, historic plumage hunting and water pollution are all pertinent examples. Loss of nesting habitat due to shoreline development, however, is frighteningly common and was the principal threat to Western Grebes during the twentieth century.

Where activities like those listed above are observed around Lesser Slave Lake, they should be documented by adding them to the LSL IBA Map and Database. Threats are indicated on the map by red sticker dots.

Further research needs to be done to know what other threats affect Western Grebes everywhere. Also, it is not known what unique threats might exist on Lesser Slave Lake. Any information regarding threats is useful and should be researched by the CE, as well as others.

Stewardship Activities are underway to protect the lake ecosystem. These activities should also be plotted on the LSL IBA Map.

The CE should seek ways which the Lesser Slave Lake Stewardship Program can benefit the conservation of Western Grebes. Stewards to monitor the active colonies and section of emergent vegetation are needed. Education about the ecology of Western Grebes and the globally significant presence on Lesser Slave Lake is extremely important. Interpretation and environmental education programs should be developed and delivered by the CE and Lake Stewards.

Appendix B. Western Grebe complete nest count data sheet.

Nest Colony Ground Survey

Date:_____ Crew:_____

Lake:_____ Colony Descriptor Name:_____

Species:_____ Estimated # of Adults:_____

Colony Location (UTM):_____ _____

_____ _____

Time Start		Wind Speed[2]		Emergent Veg. Spp[5]	
Time End		Wind Direction[3]		Backshore Veg. Spp[6]	
Air Temp. (°C)		Water Surface[4]		Mean Water Depth (m)	
Cloud Cover (%)		Island (I), Shore (S),		Colony Width (m)	
Visibility Index[1]		or Gravel Bar (G)		Colony Length (m)	

[1]Visibility Index: P = Poor; S = Satisfactory; G = Good

[2]Wind Speed: C = Calm (0-2km/hr); S = Slight (3-12km/hr); M = Moderate (13-29km/hr); G = Gusty (>30km/hr)

[3]Wind Direction: N = North; NE =Northeast; E = East; SE = Southeast; S = South; SW = Southwest; W = West; NW = Northwest; X = No Wind

[4]Water Surface: C = Calm; R = Ripples (1-5cm); SW = Small Waves (6-10cm); Medium Waves (11-20cm); LW = Large Wave (>20cm)

[5]Emergent Vegetation Species: C = *Carex*; G = Grass; N = *Nuphar*; P = *Phragmites*; S = *Scirpus*;T = *Typha*; X = No Vegetation

[6]Backshore Vegetation Species: PF=pastur forage; CC=cultivated crop; CF=coniferous forest; CR=cabin/residence; DF=deciduous forest; GF=grazed forest; MF=mixedwood forest; WS=willow/shrubs

Nest #	Clutch Size	Nest #	Clutch Size	Nest #	Clutch Size	Nest #	Clutch Size
1		25		49		73	
2		26		50		74	
3		27		51		75	
4		28		52		76	
5		29		53		77	
6		30		54		78	
7		31		55		79	
8		32		56		80	
9		33		57		81	
10		34		58		82	
11		35		59		83	
12		36		60		84	
13		37		61		85	
14		38		62		86	
15		39		63		87	
16		40		64		88	
17		41		65		89	
18		42		66		90	
19		43		67		91	
20		44		68		92	
21		45		69		93	
22		46		70		94	
23		47		71		95	
24		48		72		96	

Note: C=Chick, F=Fragments of Shells, H=Hatched Egg, P=Predated Egg
IN=Intact, PS=Partially Submerged, SU=Submerged

Grebe Colony Survey

Date:_____ Crew:_____

Lake:_____ Colony Descriptor Name:_____

Species:_____

Nest #	Clutch Size	Nest #	Clutch Size	Nest #	Clutch Size	Nest #	Clutch Size
97		141		176		211	
98		142		177		212	
99		143		178		213	
100		144		179		214	
101		145		180		215	
102		146		181		216	
103		147		182		217	
104		148		183		218	
105		149		184		219	
106		150		185		220	
107		151		186		221	
108		152		187		222	
109		153		188		223	
110		154		189		224	
111		155		190		225	
112		156		191		226	
113		157		192		227	
114		158		193		228	
115		159		194		229	
116		160		195		230	
117		161		196		231	
118		162		197		232	
119		163		198		233	
120		164		199		234	
121		165		200		235	
122		166		201		236	
123		167		202		237	
124		168		203		238	
125		169		204		239	
126		170		205		240	
127		171		206		241	
128		172		207		242	
129		173		208		243	
130		174		209		244	
140		175		210		245	

Note: C=Chick, F=Fragments of Shells, H=Hatched Egg, P=Predated Egg

IN=Intact, PS=Partially Submerged, SU=Submerged

Appendix C. Western Grebe Total Nest Count - Near Joussard Colony - Lesser Slave Lake - July 17, 2002.

Time Start	9:46	Emergent Habitat	Gravlel spit from shore
Time Finish	12:45	Emergent Vegetation Species	Scirpus sp.
Air Temp.	12C	Backshore Vegetation Species	Willow Shrub, Pasture Forage
Cloud Cover	30%	Mean Water Depth	1m
Visiblity Index	Good	Colony Width	100-400m
Wind Direction	West	Colony Length	600m
Wind Speed	Moderate (13-29km)		
Water Surface	Medium Waves (11-20cm)		

Western Grebe Complete Nest Count

Nest	Category	Cedar	Gordon	Aaron	Monica	Jul	Geroge	Count	After End
Active	With 1 Egg	9	11	1	8	20	9	**58**	12
	2 Eggs	17	29	7	29	38	28	**148**	5
	3 Eggs		2		1	4	3	**10**	
	With Hatched Eggs	2					1	**3**	3
	With Predated Eggs	2	1			5		**8**	
	Egg Fragments	1	2	1			1	**5**	1
	With Chicks		1			1		**2**	
	With Dead Chicks	2	4					**6**	
Innactive	Intact	42	102	3	91	39	97	**374**	73
	Partially Submerged	44	85	20	75	172	46	**442**	81
	Submerged	21	22	3	33	82	38	**199**	33
	Total	140	259	35	237	361	223	**1255**	208
									TOTAL
									1463

Total	Count
Eggs	384
Hatched Eggs	7
Predated Eggs	8
Chicks	39
Dead Chicks	21
Adults	27
Dead Adults	1
Discarded Eggs	14
Nests	1463

Eared Grebe Nest Count

Nest	Category	Cedar	Gordon	Aaron	Monica	Jul	Geroge		Count		After End
Active	With 1 Egg	1	3	1	2				**7**		
	2 Eggs	1	1						**2**		4
	3 Eggs	1			1				**2**		1
	With Hatched Eggs								**0**		
	With Predated Eggs								**0**		
	Egg Fragments								**0**		
	With Chicks								**0**		
	With Dead Chicks								**0**		
Innactive	Intact	1	2	4	4	1			**12**		18
	Partially Submerged		1	2		2			**5**		13
	Submerged								**0**		
	Total								**28**		36

Total	**Count**
Eggs	17
Hatched Eggs	
Predated Eggs	
Chicks	
Dead Chicks	
Adults	5
Dead Adults	
Discarded Eggs	
Nests	**64**

Coot Nest Count

Nest	Category	Cedar	Gordon	Aaron	Monica	Jul	Geroge		Count		After End
Active	With 1 Egg	1	1		2	2			**6**		1
	2 Eggs		1		1		1		**3**		
	3 Eggs	1					1		**2**		
	With Hatched Eggs	1							**1**		
	With Predated Eggs								**0**		
	Egg Fragments								**0**		
	With Chicks				1				**1**		
	With Dead Chicks								**0**		1
Innactive	Intact	4	2	1	6	3	6		**22**		1
	Partially Submerged								**0**		
	Submerged								**0**		
	Total								**35**		3

Total	**Count**
Eggs	18
Hatched Eggs	
Predated Eggs	
Chicks	2
Dead Chicks	
Adults	18
Dead Adults	
Discarded Eggs	
Nests	**38**

Franklin Gull Nest Count

Nest	Category	Cedar	Gordon	Aaron	Monica	Jul	Geroge		Count		After End
Active	With 1 Egg	1				1			**2**		
	2 Eggs								**0**		
	3 Eggs	20 (approx)							**20**		
	With Hatched Eggs								**0**		
	With Predated Eggs								**0**		
	Egg Fragments								**0**		
	With Chicks								**0**		
	With Dead Chicks								**0**		
Innactive	Intact	2				1	5		**8**		
	Partially Submerged								**0**		
	Submerged								**0**		
	Total	23							**30**		0

Total	Count
Eggs	62
Hatched Eggs	
Predated Eggs	
Chicks	32
Dead Chicks	
Adults	800+
Dead Adults	
Discarded Eggs	
Nests	**30**

Waterfowl Census

Bird	Count
YHBL	50
MAWR	2
AMWI	22
RBGU	50
SPSA	1
KILL	1
LEYE	20
CSNI	2
MALL	2
BWTE	1

Bird	Count
WEGR	27
EAGR	5
RNGR	7
FRGU	800+
COOT	18

Data Summary

Western Grebe Total Nest Count

1225 Total Nests	#	percentage (%)
Active Nests	240	19.12
Nests with eggs	216	17.21
Innactive Nests	1015	80.88
Intact Nests	374	29.80
Partially submerged	442	35.22
Submerged Nests	199	15.86

236 Active Nests	total	average/nest
Number of eggs	384	1.60
Chicks	39	0.16
Hatched Eggs	7	0.03
Predated eggs	8	0.03
Dead Chicks	21	0.09

Estimated Fraction of Colony Area	
Complete nest count	2/3
Remaining nests	1/3

Estimated Fraction Nests Counted	
Complete nest count	1
Remaining nests	1/2

Western Grebe Nests	
Counted	1463
Estimated uncounted	208
Estimated total (counted+uncounted)	1671

Nest Count Totals

Nest Count	Total	Adults	Max. Breeding Population (Calculated from whichever is greater - twice the number of nests, or the number of adults seen.)	
WEGR total count	**1255**	27	2510	Based on the nests that were counted using complete coverage (ie. total count).
WEGR after count	**208**	27	2926	Based on all the nests counted during and after the complete count.
WEGR estimate	208	27	3342	Calculated by assuming 2/3 of the colony was completely covered and half of the remaining nests were counted.
EAGR count	**64**	5	128	Likely higher because the Eared Grebe colony was centered after where the WEGR total count ended.
COOT count	**38**	18	76	Likely much higher because approx. 200 Coots were spotted on July 11, 2002.
FRGU count	30	**800+**	800+	Unknown because of the incredible numbers and poor understanding of nesting stategy.