

## COMMON LOON BREEDING IN WASHINGTON AND OREGON - 1989

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Although early records are scarce, Common Loons (*Gavia immer*) apparently nested in Washington, Oregon, and northern California (Bent, 1919; Gabrielson and Jewett, 1940; Jewett et al., 1953). Human disturbance, habitat alteration, pesticides, and entanglement in commercial fishing gear were probably major factors in the extirpation of loons as a breeding species from these 3 states by the 1950s (Corkran, 1988). Recent reports from Washington indicate either a reinvasion of some former nesting areas or the existence of a remnant breeding population (Washington Nongame Division data base; Richards and Musche, 1985; North Cascades National Park Wildlife Biologist, pers. comm.). Establishing the frequency and distribution of loon nesting in Washington would help determine both the species' legal status and the planning for its habitat. Documentation of loon nesting in Oregon could be used to change the species' legal status in that state, making it eligible for state funding for protective management and further study.

The objectives of the ongoing study are 1) to determine whether Common Loons are attempting to nest again in Oregon, 2) to investigate the locations and frequency of nesting in Washington, 3) to identify locations or habitats important to loons for pair formation, migration stopovers, or possible future nesting, and 4) to develop recommendations for conservation and management of loons and their habitat in the Pacific Northwest. The study was funded in 1989 by a grant from the North American Loon Fund.

### STUDY AREAS AND METHODS

Phase 1 - Spring observations were made of Common Loons in the Bull Run Watershed, Mt. Hood National Forest, in the northern Oregon Cascade Range (Figure 1). Between the end of March and the

end of May, 15 days were spent censusing the reservoirs from the same observation points used in previous years. At each point, all visible water was scanned several times with 10X binoculars or 20X spotting scope. Locations and movements of loons were plotted on line maps, and activity, vocalizations, and interactions between loons were described. One visit was made during July.

Phase 2 - Due to lack of funding, no early summer visits were made to the Oregon lakes where loons had been seen during surveys in late summer of 1988.

Phase 3 - Data on recent summer loon sightings and on confirmed and potential loon nesting lakes in Washington were collected during the spring, and continue to come in. Via telephone, letters, and a questionnaire, contact was made with wildlife biologists with the Washington Department of Wildlife (WDW), all National Forest Ranger Districts in Washington, several Indian reservations, several National Parks, Audubon Society groups, the Loon Lake Loon Association (LLLA), and many individuals suggested along the way. Several WDW biologists were already conducting loon surveys in their own regions. Kevin Colligan, an individual who had contacted LLLA in response to the National Geographic Magazine article about loons, not only provided information about a loon nest he had discovered, but also contacted other individuals and agencies, and helped with some of the lake surveys. Because I received leads from so many areas of the state, but did not want to duplicate WDW's efforts, I decided to visit several known loon nesting lakes and to survey lakes in several widely scattered regions that had been recommended, while just glancing briefly at others along the way. Not the most efficient method, it nevertheless provided the best way to compare the variety of habitats and regions used by loons.

With 1 to 3 others, I spent a total of 17 days during June, July, and early August surveying lakes in Washington. Some of the lakes that could be reached by car were surveyed by canoe, although several were too large and windy. Remote, mountain lakes were reached by day hiking or backpacking. Open water areas were scanned several times, and shorelines, perimeters of islands, and

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marshy areas were searched for nests or juvenile loons. Searches were made by canoe, on foot, or by scanning with binoculars and spotting scope. Human use of the lakes was recorded. Brief descriptions were recorded of the habitat parameters that are associated with loon nesting in published reports (Munro, 1945; Olson and Marshall, 1952; Jewett et al., 1953; Vermeer, 1973; McIntyre, 1975; Ream, 1976; Alvo, 1981; McIntyre, 1983). Physical attributes of lakes surveyed were obtained from Lakes of Washington (Wolcott, 1973).

## RESULTS

Monitoring in the Bull Run Watershed - As in previous years, the earliest spring sighting of loons in the watershed was around the first of April. In contrast to previous years, when the number of loons observed peaked in mid-April, in 1989 there appeared to be 2 smaller waves of migrants, with peak numbers of only 5 on April 6 and April 22. Two to 4 loons were seen on most other visits. As in all previous years except 1988, all loons apparently left the watershed by the end of May. One loon sighting on June 10 was reported from Bull Run Lake. Table 1 shows the numbers, locations, plumages, and interactions of loons seen in the watershed on each visit in 1989. All loons seen in the watershed in 1989 were in full breeding plumage.

Figures 1 and 2 are composite maps of all loon sightings in 1989 on the Upper and Lower Reservoirs. As in previous years, loons were seen in spring most commonly on the 2 main reservoirs, with infrequent sightings on Bull Run Lake. Also consistent with previous data was the observation that loon use of the Lower Reservoir was solely for feeding and resting, while loon use of the Upper Reservoir followed the same predictable pattern noticed by casual observations in the springs of 1984 and 1985, and described in our reports of 1986, 1987, and 1988. Pair behavior (swimming closely parallel or following, synchronized shallow diving or preening, frequent hoots) was most often observed near the North Fork above the logboom, or below the logboom and well above Deer Creek (see map, Figure 1). A single loon was occasionally observed

cruising in a high-breast posture from the logboom area down to Deer Creek and returning. All aggressive interactions between loons (only 1 instance in 1989) occurred in the vicinity of Deer Creek.

It appeared that, for at least the 6th consecutive year, the North Fork area down to Deer Creek functioned as a breeding territory during April and early May, but was abandoned without successful nesting having occurred. In 1984 through 1986, this territory was held by an established pair of loons, both in breeding plumage. In 1987, a single loon maintained it, and was twice observed apparently courting an immature loon (in basic plumage). In 1988, observations were either of a single loon or of a pair that appeared to be tentative and possibly just forming. In 1989, a pair held the territory again, however, inadvertent harassment by the Portland Water Bureau was observed on April 6, with the pair abandoning the territory. Whether or not harassment continued is not known, but the usual territorial pattern was not observed again until April 18. No nests or chicks were seen in the watershed, and no pairs or territorial behavior were observed after May 4.

Summer loon surveys - Between June 15 and August 7, we checked 41 lakes in Washington, although many were only visited briefly, and others were only partially surveyed. Figure 3 shows the regions of groups of lakes checked. We observed 1 or more loons at 8 of these lakes. Of these, 3 were lakes already known to have loons nesting, 1 was known to have summer flocking, and 4 had no recent summer loon sightings. We discovered no new nesting, but several potential sites which should be monitored in subsequent years.

Reports have been received from 39 additional lakes (plus from several that we did visit) where loons have been seen in spring or summer in recent years, or where the habitat appears to be appropriate. Several recent nest records were reported that were not widely known previously. Many records reported here came from WDW and other biologists. Our brief visits missed seeing nesting loons at 2 lakes, so we know not to waste time on brief visits anymore.



Common Loons nested (or apparently attempted to nest) at 8 lakes in Washington in 1989, and there is an unconfirmed report from 1 other lake. Five of the 8 lakes each had one pair nesting, Entiat and South Twin each had a second pair (but no confirmed second nest), and Chester Morse Reservoir had 3 loon nests. Nesting was not successful at either North or South Twin Lakes for the third consecutive year. Each other nesting pair apparently fledged 1 chick (total of 3 at Chester Morse), except for 2 at Entiat. Total known loon production in Washington in 1989 was probably at least 9 chicks.

Table 2 lists all known nesting records for Washington, confirmed and unconfirmed, including published records before 1950. It shows the dates of the records and the source (or sources) of each record.

Table 3 lists all lakes that we visited, all lakes with summer loon sightings reported by others (1988 and 1989), and all known lakes with confirmed or unconfirmed nest records, old or recent. Some physical attributes of the lakes, the number of loons seen or reported, and all nesting records are shown. All of the lakes in Table 3 are also shown on Figure 3.

Many differences in habitat were revealed by a comparison of lakes with known nesting in 1989. We visited Lost, South Twin, and Calligan and obtained some data on North Twin, Entiat, Chester Morse, and Hozameen. Most are moderately large lakes (several hundred acres), but Entiat is 9,860 acres and Lost is only 47 acres. Maximum depths range from 36 at Lost to around 300 at Entiat. North and South Twin and Lost have extensive marshes with large areas of pond lily (*Nuphar polysepalum*) and emergent vegetation. However, Entiat (also in eastern Washington) has no emergents but extensive beds of a milfoil type of submergent, while Chester Morse, Hozameen, and Calligan (on the west side) have no real establishment of any aquatic plants. Human use ranges from virtually none on Chester Morse (the Seattle watershed is closed to all public access) to fairly intense use on North and South Twin, which have cabins, camps, power boats, and fairly heavy fishing pressure including both trout and a newly developed bass fishery

near the marsh that provides loon nesting and chick rearing habitat.

Only 2 similarities in habitat at known loon nesting lakes appeared. Each of the lakes has extensive areas of shallow water around the perimeter. And all have apparently large fish populations, with large numbers of fish smaller than 3 inches. Although the mix of species differs, all the lakes have brook trout (*Salvelinus fontinalis*), rainbow trout (*Salmo gairdneri*), and/or cutthroat trout (*Salmo clarki*), and some also have whitefish (*Prosopium sp.*) or bass (*Micropterus sp.*). Several of the lakes were naturally barren, and some of these are still regularly stocked. Natural spawning apparently occurs in many (possibly all) of these lakes, providing fish small enough to be utilized as a food resource for young loon chicks.

Appendix A lists all lakes with confirmed or unconfirmed loon nesting and several which appeared from the surveys to have high potential for loon nesting. For each lake listed, there is a brief analysis of human and loon use, and current management. Recommendations for future loon monitoring, and probable monitoring plans by others, are given and, for some lakes, suggestions for management for loon nesting.

#### DISCUSSION

No direct evidence that Common Loons are nesting in Oregon was obtained. Spring use of the Bull Run Watershed was by breeding adults resting and feeding during migration, except for a pair that used the North Fork area as a territory that they patrolled and defended. Particularly because of the known disturbance of the pair during early April, intended nesting in 1989, and use of the Watershed for nesting in the future, cannot be ruled out. The persistent pattern of use of the Upper Reservoir indicates both the probability that the same individual loon or loons use the lake every year, and the possibility that the lake serves an important function in at least the early phases of the breeding season. The Water Bureau will be asked if its management activities in the North Fork area can be postponed in 1990 until after the loons have left.

Much work in Washington remains to be done. Many lakes with good potential have not been surveyed in summer. Several lakes where loons were seen in 1989 need to be monitored over the next few years. We have approached the WDW about helping with the intensive surveys needed in several parts of the state in 1990.

Although our surveys did not locate any new loon nests, we did gather data from many sources around the state and help put it all together. It will be made available to the WDW nongame data base. We will continue to encourage the interest expressed, by individuals from several agencies, in managing lakes to benefit loons. Contacts established with wildlife biologists and birdwatchers will be maintained, and efforts will be continued to keep data from all sources going into the state's data base.

The 2 similarities found by comparison of 7 of the 8 lakes with confirmed nesting in 1989 (extensive shallows and large populations of fish, with large numbers of small fish) are probably related. Extensive shallows may provide habitat for spawning and/or for small fish, which are utilized by loons to feed to their chicks. Natural spawning, which apparently occurs at most or all of the 7 lakes, may be a key factor in choice of these lakes by loons for nesting.

In conversations with several biologists and birdwatchers in Washington, concern was expressed that nesting loons are extremely vulnerable to human harassment. There was considerable worry that this report would instead be an article in a popular magazine or newspaper, and that confirmed loon nest locations would be made known to over-eager birdwatchers and photographers. I share the concern over nesting loon vulnerability, and feel strongly that human harassment not only can cause abandonment of loon nests or chicks, but also could cause loons to abandon a lake where they would otherwise return to nest in a subsequent year. In my opinion, there is considerable significance to the fact that there were 3 successful loon nests on Chester Morse Reservoir, which is closed to all public access, while North and South Twin Lakes, which have fairly intense human use, have had no successful nesting for 3 or 4 years in a row, although both produced loon chicks in

1981 through 1985 or 1986. Appendix A includes further discussion of this problem, some suggestions, and some solutions already in place, for some of the individual lakes. I hope to continue working with agencies and individuals to increase public awareness of the loons' vulnerability, and to solicit public cooperation in their protection.

In Washington, loons nested in 1989 in widely separated areas of the state, and in notably varied lake types. While it is possible that loons have been nesting in the state continuously since the 1920s (the only confirmed records before 1981), it is more likely that the current situation is a reinvasion after an absence of nesting. Both popularity of birdwatching and interest in loons have existed longer than 10 years (although both have increased), so, if nesting had occurred continuously, at least sporadic records should be available. However there are only 2 unconfirmed nesting reports from the 5 decades between 1930 and 1980, while there are 38 confirmed and unconfirmed reports in the most recent decade. Furthermore, confirmed nesting on at least 1 lake has been preceded, not by unconfirmed reports of nesting, but by confirmed sightings of a pair of loons resident for part of the summer. If this is the mechanism of breeding range extension or reinvasion, then perhaps the recent increase in summer loon sightings at lakes with no recent nest records may herald a further increase in the number of lakes with nesting loons, in Washington and perhaps Oregon as well.



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## APPENDIX A

### OLYMPIC PENINSULA

Ozette Lake - The lake is part of the Olympic National Park (NP), however the surrounding land on all but the west side is private. The lake appears to have excellent habitat, with several protected bays and islands, some shallows with minor emergent vegetation, and a good fish population. A pair of loons was seen in the early summer. We saw 2 separate loons, 1 adult and 1 immature, in mid-June, although we could only get to the northern third of the lake. Park ranger Becky Young and the owners of 1 of the cabins are interested in the loons and would perhaps monitor them. If loon nesting attempts were reported and the sites located, 1 or more portions of the lake could perhaps be closed to boats during the nesting season. This is a high priority for monitoring.

Quinault Lake - Managed by the Quinault Indian Council, most surrounding land is Olympic NP or Olympic National Forest (NF). A heavily developed lake, it nevertheless has a reliable (but unconfirmed) sighting of a loon adult carrying a chick in 1984. The wide river inlet area is reported to have several beaver ponds and no human use, and could provide a protected nest site. We did not see any loons in mid-June, but a loon had been heard by 2 biologists several days before. NF biologist Mark Ostwald is very interested in loons and will probably monitor the lake. The inlet area is a high priority for monitoring.

### WEST SLOPE NORTHERN CASCADES

Ross Lake - The lake is in the Ross Lake National Recreation Area (NRA), administered by the North Cascades NP. I have no data on habitat or management. One unconfirmed loon nest record exists from 1985 (several others are probably mergansers). NP biologist Bob Kuntz is currently studying the history of loon nesting in Washington, and will may monitor at Ross Lake.

Hozomeen Lake - It is in the back country of the Ross Lake NRA, with access by trail. Successful loon nesting has been confirmed in 1988 and 1989, and there are unconfirmed reports from 1977 and 1985. Human use is mostly on weekends starting Memorial Day. Because of potential harassment, the NP will be closing the lake to all public access during the loon nesting season. They will be continuing to monitor loon nesting success.

Baker Lake - On the Mt. Baker/Snoqualmie NF, Baker is a natural lake augmented by a dam. At the end of June we saw at least 10 loons in summer flocking behavior. There have been many summer sightings of singles, pairs, and summer flocking, but no reports of nests or chicks. NF biologist Brady Green is only able to do limited monitoring. Puget Power (which manages the dam) has biologists monitoring certain wildlife around the lake. They have installed 2 floating nest platforms for loons in Depression Lake, which is an overflow lake at the dam. Baker Lake has good habitat potential for loon nesting, and should be a high priority for monitoring in May and June. If a nesting attempt is found, it

appears possible to close that bay to boat use during the nesting season, perhaps by means of a logboom, and to install a floating nest platform if changing water levels are a problem.

Shannon Lake - Adjacent to Baker Lake, Shannon has fairly similar habitat. We saw 1 loon in late June, but know of no other sightings. It should be monitored along with Baker Lake.

#### WEST SLOPE CENTRAL CASCADES

Tolt Reservoir - Part of Seattle's watershed, it is closed to public access (even NERI loon surveyors). There have been several loon sightings in recent summers, including a pair in 1989. Fortunately WDW biologist Rocky Spencer will probably continue to monitor, as there is a good likelihood of loons nesting in the future, due to its proximity to Chester Morse and Calligan.

Chester Morse Reservoir - This is the other large lake in the Seattle watershed, closed to public access. There has been confirmed nesting the last 3 years, with 3 successful nests in 1989. Rocky Spencer (WDW) will probably continue the monitoring.

Calligan Lake - The largest of the lakes on Weyerhaeuser's Snoqualmie Treefarm near the Seattle watershed, it has had confirmed loon nesting for the last 2 years. Kevin Colligan reported the 1988 nesting to the Loon Lake Loon Association (LLLA), monitored in 1989, and will probably continue to monitor. WDW biologist Rocky Spencer was concerned that fishermen would disturb the loons nesting, and he contacted Weyerhaeuser. They are very supportive, and have agreed to lock the gate on the road to Calligan Lake during the loon nesting season.

Mud Lake and surrounding lakes - Mud Lake is one of the many lakes on the Snoqualmie Treefarm. Although the report of a loon nest in 1984 could have been a mistake, this tiny lake does have good habitat. However, heavy use by fishermen, especially in spring, would make it difficult for loons to initiate nesting, and so it is a lower priority for monitoring. Several other lakes on the treefarm appear to have good habitat also, and the more remote ones should be a very high priority for surveying. We have started making plans with Kevin Colligan to hike in to 1 or 2 of them in 1990. Rocky Spencer (WDW) may do some aerial surveys.

Kapowsin Lake and surrounding lakes - I have no data on management or habitat. Rocky Spencer (WDW) indicates that human use is not too heavy. Confirmed nesting reports from the turn of the century are published in Jewett, et al., 1953. It should be a high priority for surveying. Jewett also reported loon nesting at an unnamed "pond" nearby. Not knowing which it is, I would suggest that surveying all the nearby lakes should be a high priority.

#### OKANOGAN COUNTY

Big Hidden Lake - Deep in the Pasayten Wilderness, this lake has an unconfirmed nest record from 1948. We had neither the time to backpack nor the funds to horse pack to it in 1989. The horse

packer, Claude Miller, reported that loons probably nested again in the 1970s, but that several low water years allowed winter kills of the fish, and loon sightings have not been as frequent since. Perhaps Claude Miller will continue to keep an eye on the loons, but someone should get to enjoy packing in with him to survey more formally.

Palmer Lake - I have no data on management or habitat. Summer flocking has been observed several years, but there was also a report of a pair early in 1989. This should be a high priority for monitoring in May, although WDW biologist, Ron Friesz, and his assistant may have already accomplished that. It is one to keep checking over the next few years.

Spectacle and Whitestone Lakes - These lakes have houses nearby, but dense emergent vegetation protects the perimeters. There is an unconfirmed loon nest record from Spectacle in 1989. Early fishing pressure might be fairly intense at both of these lakes. They should be high priority for monitoring, especially in order to verify the nesting at Spectacle. Ron Friesz, WDW, will probably do the monitoring.

Lost Lake - On the Okanogan NF, this lake has cabins and camps around it, but they are all set back from the lake shore, and an extensive marsh adds further protection. Roy Visser, who owns a cabin there, has notes on summer loon occurrence, apparently during 1986 and 1987, and of nesting in 1988 (Newsletter of North Central Washington Audubon Society). On our 1989 visit at the end of June, there were 2 loon chicks, each following 1 parent for part of the time (although 1 chick received more food during the periods I watched). The adults fed them small fish at an amazing rate in the late evening. In the morning, a third loon was present, and all 3 adults flew away, 1 returning after about 30 minutes. Roy Visser only saw one juvenal in August. He and WDW biologist, Ron Friesz, will probably continue to monitor nest success. Ron Friesz is very concerned about loon harassment by nature photographers, and was worried about my publishing an article in a popular magazine. He is also concerned about possible conflicts between loons and fishermen over the fish management in the lake.

#### COLVILLE INDIAN RESERVATION

Omak Lake - The largest of the lakes on the Colville Indian Reservation (CIR), this was too big and windy for our canoe, so we only surveyed part of it, and looked from at least a mile away at several excellent bays. An unconfirmed report of loons nesting in 1920, and the pair we saw in late June, make this a high priority for a full survey effort. We have already been tentatively invited to accompany the CIR biologist, Steve Judd, to help survey Omak Lake in 1990.

Owhi and Little Owhi Lakes - These adjacent lakes are on the CIR, the first being a reservoir that receives a lot of camping and fishing use, the second being a natural lake that appears to get little human use. The first appears to have a large fish



population, but otherwise not ideal loon habitat, while the second has excellent loon nesting habitat, although we did not see any fish. Presumably nesting loons could use them both. We saw 2 loons on Owhi in late June. These 2 lakes should be high priority for continued monitoring. If it is found that loons do use Little Owhi, since the Indians seem not to, perhaps they could be encouraged to manage it for loons, checking the fish population and possibly stocking a small species most useful to the loons.

North and South Twin Lakes - These adjoining lakes are on the CIR, and both receive heavy use for fishing, boating, and camping. Loons nested successfully on both from 1981 through 1985, and on North in 1986. However, since then, loons have apparently attempted nesting (confirmed nest on South in 1987), but no chicks have been seen. CIR biologist, Steve Judd, in response to my question about possible increased human use, gave the opinion that overall use has not increased, but that 1 possibly significant change has been the development of a bass fishery, which brings fishermen closer to the areas of pond lily and emergent vegetation, which is where the loons nest, and where there is protective cover for young chicks. There could also have been a change in the availability of small fish appropriate for feeding to small chicks. He expressed some interest in possibly looking further into these factors. I would recommend that fish populations be studied, and that intensive monitoring occur at the beginning of the loon nesting season. If direct disturbance is found to be the problem, it appears possible to attempt restricting human access to the critical area of each lake (using a logboom or several sign buoys), and initiate educational programs to obtain the cooperation of the public.

#### COLUMBIA CHANNELS

Rufous Woods, Entiat, Priest Rapids, and Hanford Reservoirs, and Banks Lake - All of these vast pools of the Columbia River (or old channels in the case of Banks), and probably other Columbia pools, have some suitable loon habitat, and many undisturbed areas simply because of the magnitude of the lakes. Our 1989 survey did not attempt to include these. Loon nesting has been confirmed on Entiat, but there are unconfirmed reports from Rufous Woods, Banks, and Hanford Reach also. The nest site on Entiat is very near a state park boat ramp that was constructed in 1989. Even if it were possible to steer people away from the nest site, waves from the boats may cause problems unless a logboom could be used as a barrier to both boats and their waves. I think it is very likely that loons are nesting at other locations on these reservoirs, but it will take a powerful boat and a lot of time to adequately survey them. It should, however, be a high priority. Ron Friesz and other WDW biologists will probably continue to monitor some of these. Fluctuating water levels may be a problem in most of the pools, but floating nest platforms could probably be built if apparently flooded or stranded nests were found.

#### EAST SLOPE CENTRAL CASCADES

Wenatchee Lake - On the Wenatchee NF, this large lake is heavily  
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used for fishing, waterskiing, camping, and there are many cabins along the shores. However, it does have a quiet arm to the west, where a nesting loon was recorded in 1989. It appears possible to restrict access to this arm, by means of a logboom, during the loon nesting season.

Fish Lake - Although the east half of the lake has many cabins, a resort, and lots of fishing, the west end is apparently managed for wildlife by the Wenatchee NF. Thick stands of emergents create excellent cover. The lake did appear to have been treated with some chemical when we visited briefly in August. Particularly because of the nesting at nearby Wenatchee Lake, this should be a high priority for monitoring.

#### NORTHEAST CORNER

Sullivan Lake - This is a natural lake augmented by a dam. It is on the Colville NF. There have been several loon sightings in recent summers. NF biologist Tem Bertram will probably continue limited monitoring, and is planning to build 2 floating nest platforms. WDW biologist Steve Zender also surveyed in mid-June of 1989. Additional monitoring in early summer should be a high priority.

Loon Lake - Home base of the LLLA, this lake is well monitored, and its human users are kept well informed of the needs of loons. Loons are seen each spring and fall, and there have been summer sightings of a pair in 1988 and 1989. If the experience at Lost Lake is an accurate example of the mechanism by which loons invade new territory for the purpose of nesting (namely by lengthening periods of residence by a pair in the summers preceding nesting), then the dream of the LLLA could well come true in the next few years!

Chapman Lake - I have no data on management or habitat. There is a confirmed nest record from 1925, but I know of no loon sightings in recent years. It should certainly be checked.

Table 1. NUMBERS, PLUMAGES, INTERACTIONS, AND LOCATIONS OF COMMON LOONS IN THE BULL RUN WATERSHED IN 1989.

Locations are mapped in Figures 1 and 2. B = loon in breeding plumage. M = loon molting from breeding to winter plumage. B-B = pair of loons in breeding plumage. \* = aggressive interaction between loons (or between loons and the observer). + = non-aggressive interaction between loons. , = loons not close together and no interaction. 0 = no loons seen at that location. -- = location not visited on that date. Loons seen moving from 1 location to another are shown at both. All observations are by the author except those of 6/10 and 10/27.

DATE	UPPER RES. ABOVE LOGBOOM	UPPER RES. BTW. LOGBOOM & DEER CR.	UPPER RES. BELOW DEER CR.	LOWER RES.	BULL RUN LAKE
1/24	0	0	0	B?	--
3/23	0	0	0	0	--
4/2	B-B*observ.	B-B, B	0	0	--
4/6	0	B-B	B-B+B, B	B	--
4/8	B	B	B	B	--
4/12	0	B	0	0	--
4/16	0	0	0	B, B	--
4/18	B-B	B, B	0	B	0
4/22	B	B-B	B, B, B	B	--
4/25	B-B	0	0	B	--
4/30	B	B-B	B	B	--
5/4	0	B-B*B	B, B	0	--
5/13	0	0	0	0	--
5/21	0	B	B	0	--
5/28	0	0	0	0	--
6/10	--	--	--	--	B
7/4	0	0	0	0	0
9/4	--	--	--	--	M
9/10	0	0	0	0	--
9/17	0	0	0	0	--
10/27	--	--	--	--	M?

Table 2. NESTING RECORDS OF COMMON LOONS ON WASHINGTON LAKES.

Includes all published early records (P), recent confirmed nesting records (C), and recent unconfirmed nesting reports (U). Apparent unsuccessful nesting attempts on lakes with confirmed nesting in preceding years are included in C. Jewett is Jewett, et al., 1953; Rich. & Mus. is Richards and Musche, 1985; WDW is Washington Department of Wildlife, Nongame Data System records from nongame biologists and members of the public; NCNP is North Cascades National Park records from wildlife biologists and members of the public; Colv. is Colville Confederated Tribes Fish and Wildlife Department; Wen. NF is Wenatchee National Forest; LLLA is Loon Lake Loon Association and sightings reported to them; NERI is 1989 surveys by Northwest Ecological Research Institute and sightings reported to them. Lake numbers correspond to Figure 1.

LAKES	YEARS	TYPE OF RECORD	SOURCE OF REPORT
<u>West side of Cascade Range</u>			
1 Quinault	1984	U	WDW
2 Ross	1985	U	NCNP
3 Hozameen	1977, 1985	U	WDW, NCNP
	1988, 1989	C	NCNP
4 Mud	1984	U	NERI
5 Calligan	1988, 1989	C	LLLA, WDW, & NERI
6 Chester Morse Res.	1987 - 1989	C	WDW
7 Kapowsin	1898, 1902	P	Jewett
8 ? (near Kapowsin)	1906	P	Jewett
<u>East Side of Cascade Range</u>			
9 Big Hidden	1948	U	WDW
10 Spectacle	1989	U	WDW
11 Lost	1988, 1989	C	WDW & NERI
12 Omak	1920	P (unconfirmed)	Jewett
13 North Twin	1981 - 1989	C	Colv., Rich. & Mus.,
			LLLA
14 South Twin	1981 - 1989	C	Colv., Rich. & Mus.,
			LLLA, NERI
15 Rufus Woods Res.	1984	U	Colv.
16 Wenatchee	1989	C	WDW, Wen. NF
17 Entiat	1986	U	WDW
	1989	C	WDW & NERI
18 Banks	1988	U	WDW
19 Hanford Reach	1988	U	WDW
20 Chapman	1925	P	Jewett

Table 3. COMMON LOON NEST RECORDS AND SURVEYS OF WASHINGTON LAKES.

Includes lakes surveyed by NERI in 1989, lakes with recent summer sightings reported by others, and all lakes with nesting records. AREA = lake surface in acres. DEPTH = maximum depth in feet. ELEV. = elevation above sea level in feet. HUMAN USE: 1 = irregular, infrequent human visits; 2 = at least weekly visits, small numbers of people, usually no power boats, parts of lake inaccessible; 3 = daily use, moderate numbers of people, usually speed restriction on power boats, parts of lake inaccessible; 4 = heavy, daily, unrestricted use of most of the lake. LOON USE = number of loons seen during summer of 1989 (approximately June 1 - Aug. 10), and C = confirmed nesting, U = unconfirmed nesting, X = apparently an unsuccessful nesting attempt, Pr = pair seen during summer, F = summer flocking, - = not visited and no report from 1989, S = summer sightings from 1980-1988. Information is from 1989 or is followed by the year of the record. NERI = NERI surveys: o = brief visit, / = partial survey, + = complete survey. All lakes are shown on Figure 1. Numbered lakes are also on Table 2.

LAKES BY REGION	AREA	DEPTH	ELEV.	HUMAN USE	LOON USE	NERI
<u>West side of Cascade Range</u>						
<u>Olympic Peninsula</u>						
Ozette	7787	331	29	3	2, Pr	/
Dickey	527	30?	193	1	0	/
Wentworth	54	21	147	?	1	
Irely	20	10?	550	1	0	+
1 Quinault	3729	300	182	3-4	1, U-84	o
<u>West Slope Northern Cascades</u>						
2 Ross	11678	400	1599	3	-, U-85, S	
3 Hozameen	111	65	2800	1-2	C-88,89, U-77,85	
Baker	3616	273	724	3	10+, F, S	/
Depression	50?	30?	724	2	0	+
Shannon	2148	255	438	3	1	o
<u>West Slope Central Cascades</u>						
Tolt Reservoir	850	220	1765	1	Pr, S	
4 Mud	16	12	1270	2-3	-, U-84	
5 Calligan	361	82	2222	2-3	C-88, 89	o
6 Chester Morse Res.	1682	116	1555	1	C-87-89	
7 Kapowsin	512	58	600	?	-, C-1898, 1902	
8 ? (near Kapowsin)	?	?	?	?	-, C-1906	
<u>Alpine Lakes Wilderness Area</u>						
Dorothy	290	152	3052	2	0	+
Bear	49	20?	3670	2	0	+
Deer	46	20?	3630	2	0	+
Snoqualmie	126	150	3225	2	0	/
Trout	17	20	2012	2	0	+
Delta	47	60	3500	1	0	/
Otter	183	240	4400	1	1	/

Table 3. LOON SURVEY cont.

LAKES BY REGION	AREA	DEPTH	ELEV.	HUMAN USE	LOON USE	NERI
<u>East Side of Cascade Range</u>						
<u>Okanogan County</u>						
9 Big Hidden	71	?	4300	2	-, U-1948	
Black	66	100?	4000	2	0	+
Palmer	2063	91	1145	3?	Pr, F, S	
10 Spectacle	315	60	1363	3	U-1989	o
Whitestone	170	26	12250	3	0	o
Blue	186	69	1686	3	0	o
Fish	102	60	1798	3	0	+
Conconully	313	109	2324	3-4	0	/
Conconully Res.	450	40	2287	3-4	0	/
Brown	61	14	1572	2	0	+
Green	45	40	1560	2	0	/
Leader	159	40	2273	3	0	/
11 Lost	47	36	3817	2	C-88, 89, S	/
Bonaparte	159	109	3554	2-3	0	/
<u>Colville Indian Reservation</u>						
Crawfish	80	36	4475	3-4	0	/
12 Omak	3244	325	950	3	2, U-1920	o
Johnson	58	20?	2180	1	0	+
Little Owhi	39	20?	2600	1	0	+
Owhi	500	50?	2566	2-3	2	+
Buffalo	542	121	2402	2	0	/
McGinnis	115	46	2375	2	0	/
13 North Twin	744	50	2572	3-4	2, X-87-89, C-81-86	
14 South Twin	973	57	2572	3-4	7, X-86, 88, 89, C-81-85, 87	/
Elbow	51	10?	2150	1	0	/
La Fleur	25	10?	2250	1	0	/
Big Simpson	22	40	2250	1	0	/
15 Rufus Woods Res.	7800	190	946	?	-, U-1984	
<u>East Slope Central Cascades</u>						
16 Wenatchee	2445	300	1875	4	C-1989	o
Fish	513	135	1850	3	0	o
<u>Columbia Channels</u>						
17 Entiat	9860	300?	707	3	C-89, S, U-86	
18 Banks	24900	85	1560	3	Pr, U-88	
Lenore	1670	?	1075	3	0	o
Priest Rapids	7700	88	488	3	1+, S	
19 Hanford Reach	38800	130	340	3	1+, U-88, S	
<u>Northeast Corner</u>						
Sullivan	1291	312	2583	3	Pr, S	
Kings	53	51	3250	?	1	
Loon	1119	104	2381	3	Pr, S	
20 Chapman	146	160	2154	?	-, C-1925	



Figure 1. BULL RUN UPPER RESERVOIR - COMMON LOON SIGHTINGS IN 1989.

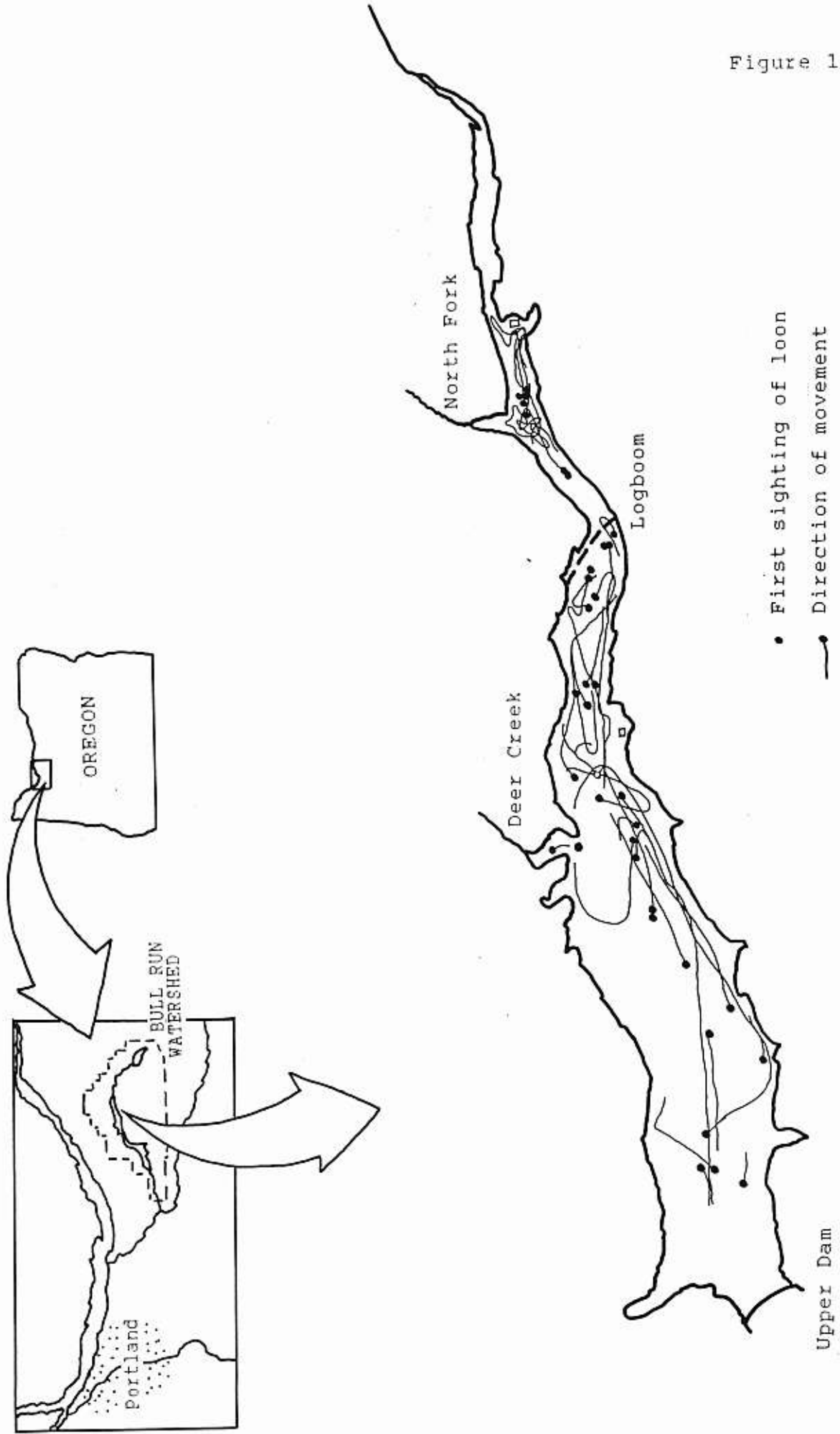


Figure 1.

Figure 2. BULL RUN LOWER RESERVOIR - COMMON LOON SIGHTINGS IN 1989.

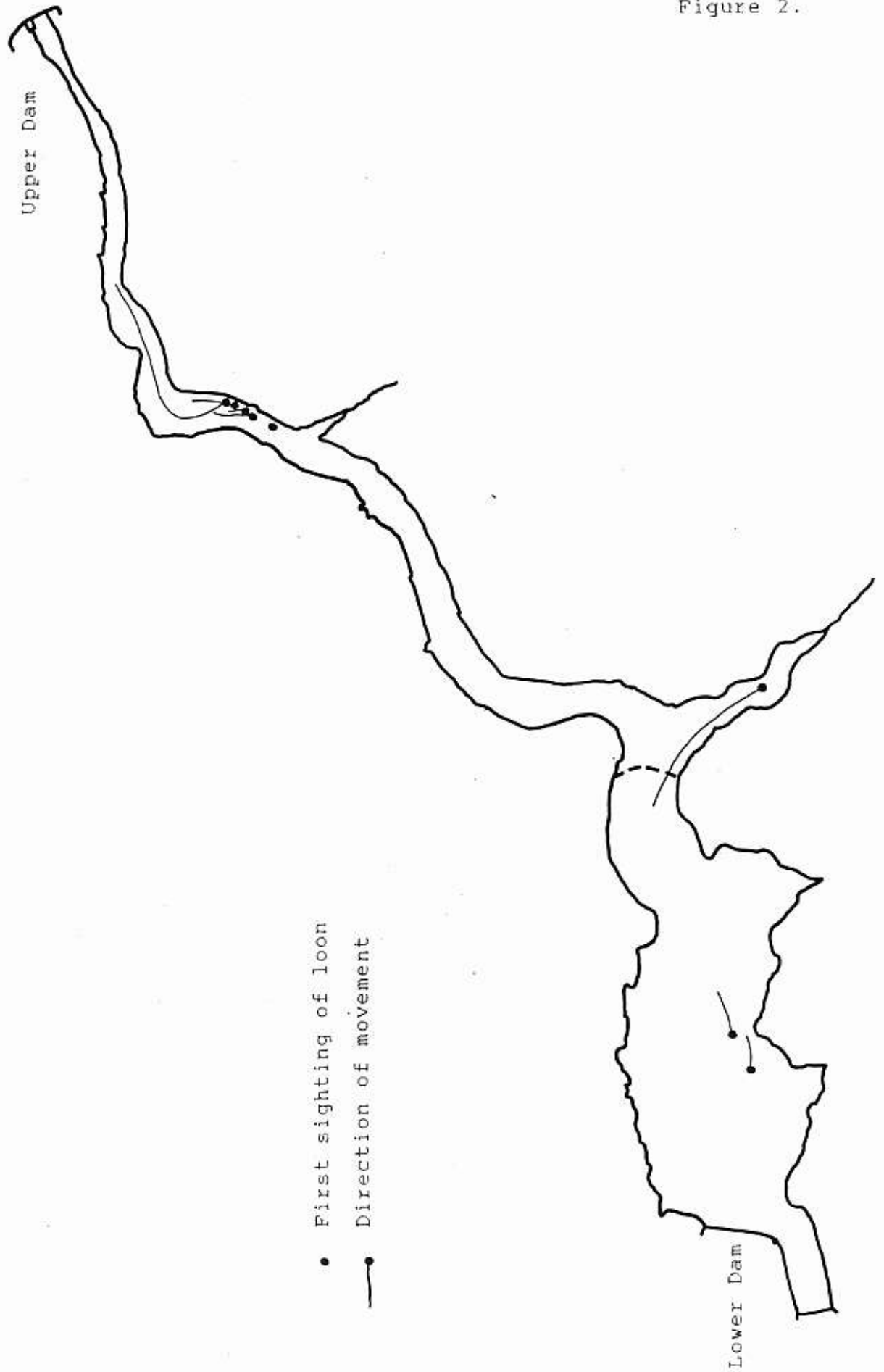
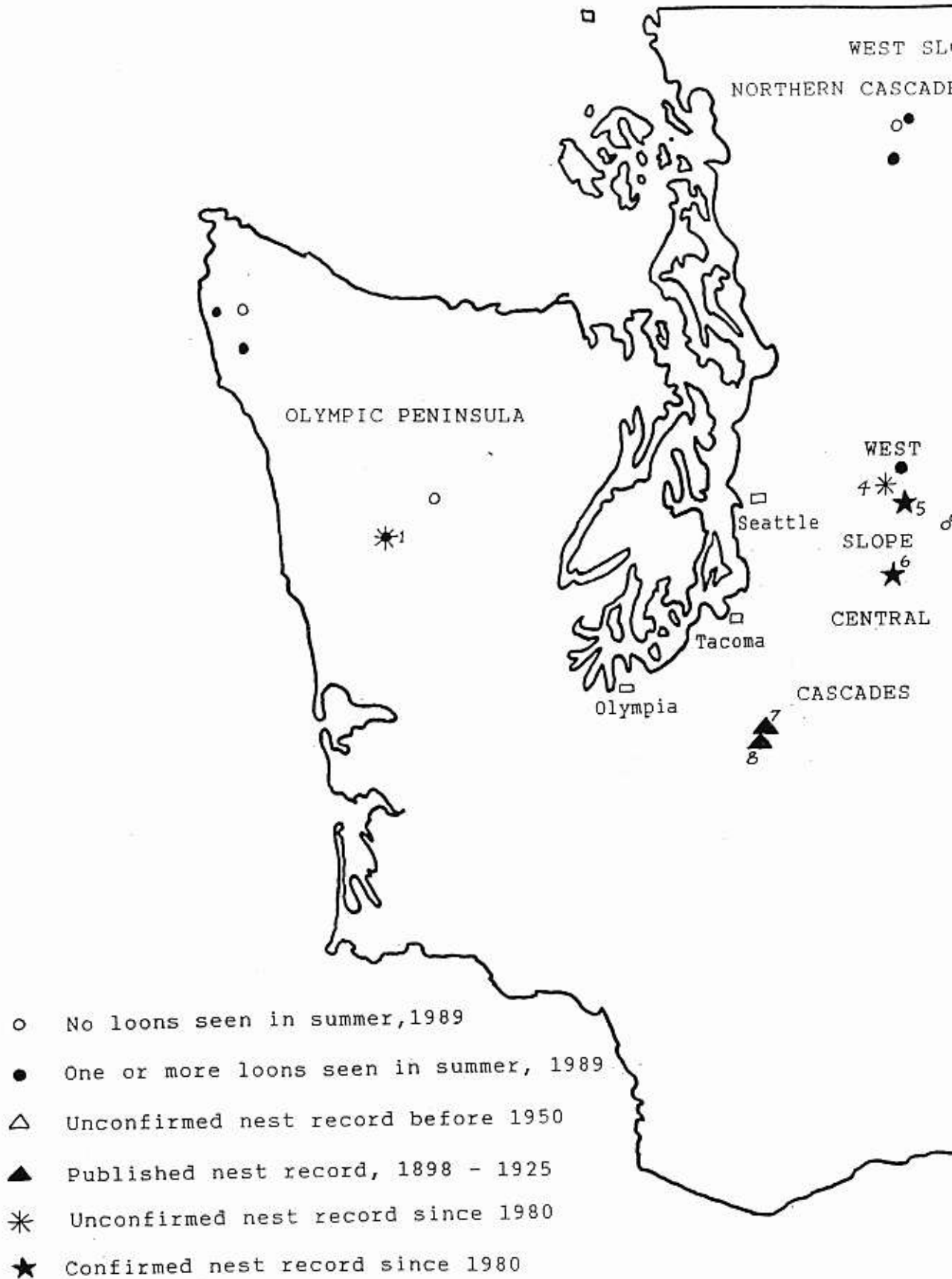


Figure 2.

Figure 3. 1989 COMMON LOON S



REVIEW OF WASHINGTON LAKES AND ALL NEST RECORDS.

