

Spotted Owl Habitat Considerations with regard to Barred Owl Presence

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Clarifying the Issues

The question of what can/should be done about the Barred Owl is not one of the issues presented here

Issues:

- 1) Numbers and distribution of Barred Owls
- 2) Impacts to Spotted Owl habitat
- 3) Instances of interaction
- 4) Can Barred Owls and Spotted Owls co-exist:
examples on the Cowlitz Valley Ranger District.

Numbers and Distribution of Barred Owls

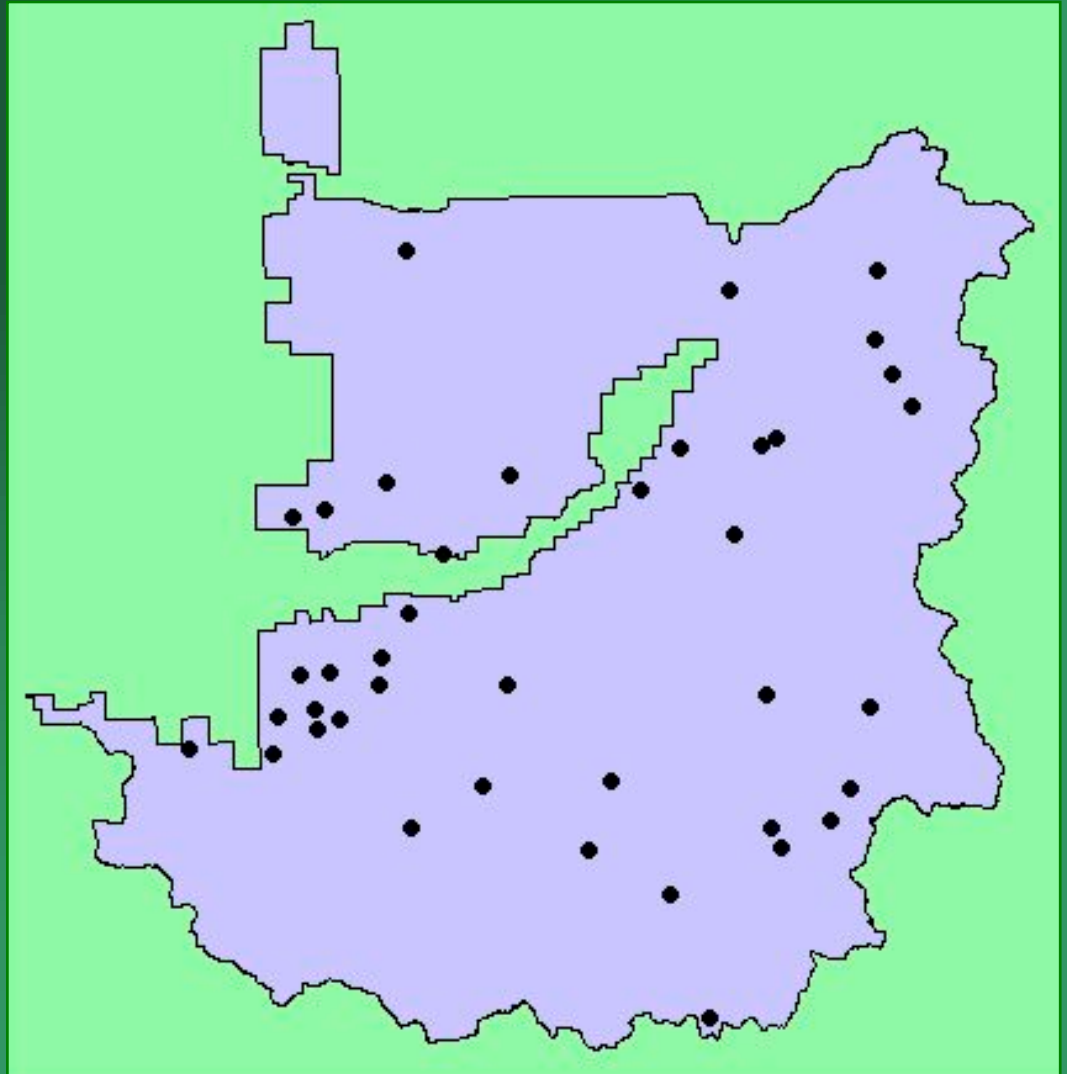
Barred Owls were recorded on survey forms when detected during Spotted Owl surveys

Most often this is where the data on Barred Owls remained, except in certain local areas

While we know to a general extent where Barred Owls are at, the full extent of Barred Owl numbers and distribution can only be estimated

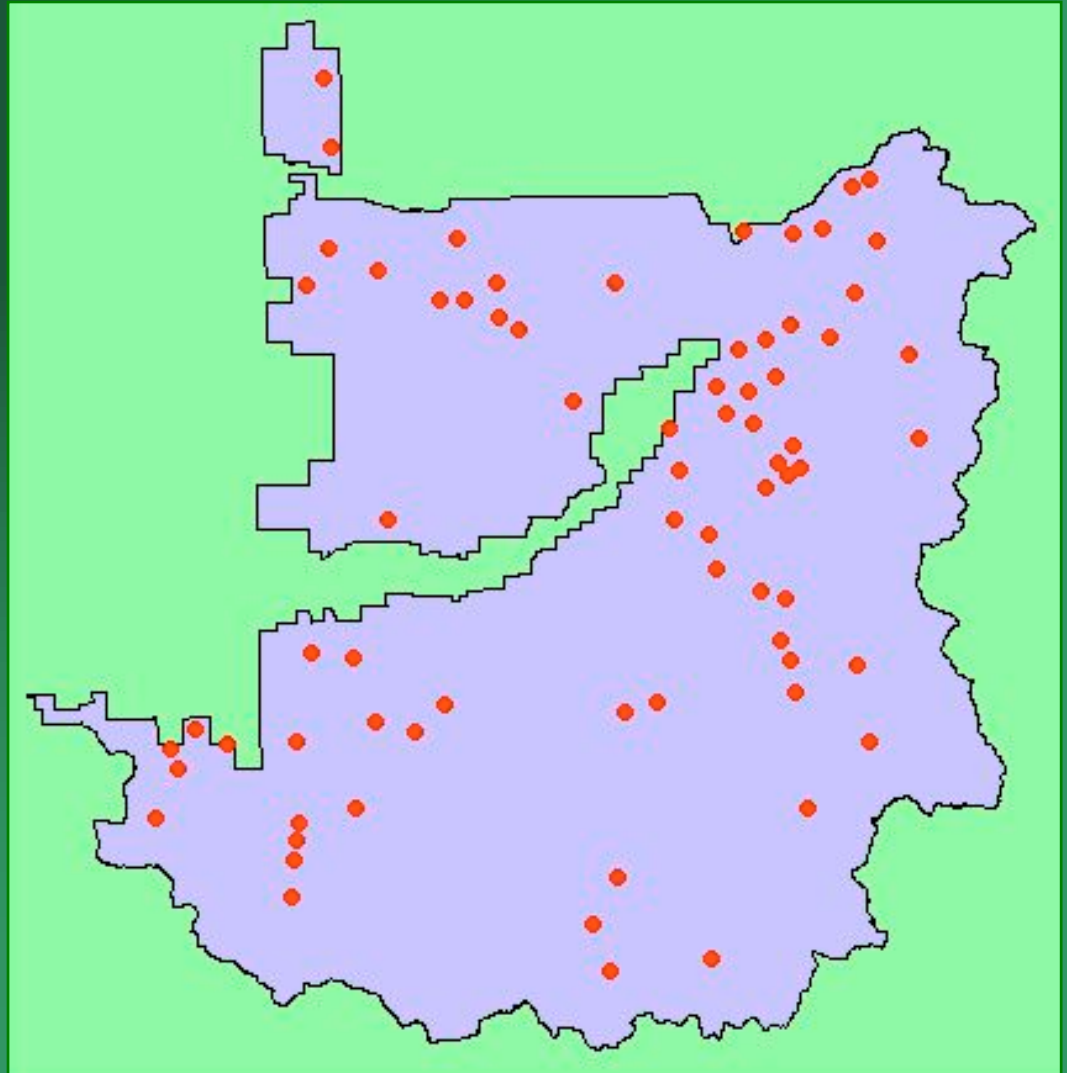
Agency survey Barred Owl sites

Forest
Service
Barred Owl
sites
identified
1978 to 2003
(black dots)
($n=40$)



Additional Barred Owl sites

Additional
non-agency
Barred Owl
sites
identified
since 1992
(red dots)
($n=72$)



Potential underestimation of Barred Owl numbers

Surveyors were not necessarily trained to recognize different Barred Owl vocalizations

Habitat considered not suitable for Spotted Owls was not surveyed but may have supported Barred Owls

Evidence of Barred Owls may not have been recorded (short vocalizations, silent fly-ins)

Sympatry characteristics

1. Habitat
2. Nests
3. Prey base
4. Home range size
5. Territoriality



1. Habitat

Barred Owls are found in habitat similar to Spotted Owl habitat

In the North Cascades, radio-tagged Barred Owls and Spotted Owls had similar cover-class compositions, but Barred Owls spent the more of their time in pole-size and small saw-size forest while Spotted Owls spent more time in older forest (Hamer 1988, Hamer et al. 1989).

1. Habitat (cont.)

In the Central Cascades, there were minor differences in the amount of old and mature forest habitat surrounding Spotted Owl and Barred Owl site-centers, but Spotted Owls had more ha of older forest within 0.8-km of their site-centers than did Barred Owls (Herter and Hicks 2000).

In the southwest Cascades, there was no significant difference between Spotted Owls and Barred Owls within 0.8-km plots for any forest-age-class tested (Pearson and Livezey 2003).

2. Nests

- Both Barred Owls and Spotted Owls primary nest choice is a cavity in a large tree (Postupalsky et al 1997, Forsman et al 1984), although both species will also nest on platforms and in nest boxes (Postupalsky et al 1997, pers. obs.).
- In the North Cascades, all the nests located by Hamer for both Barred Owls ($n = 11$) and Spotted Owls ($n = 10$) were in cavities (Hamer et al 1989).

3. Prey base

- Hamer et al. (2001) found a 76 percent overlap between samples of prey for Spotted Owls and Barred Owls.
- Overall, Spotted Owls in this study preyed on a few arboreal or semi-arboreal species at high frequencies whereas Barred Owls preyed on a broader range of species at lower frequencies.

4. Home range size

- In the North Cascades, mean Barred Owl home-range size was 218 ha for the breeding season, 488 ha for the non-breeding season, and 526 ha annually. (Hamer et al. 1989)
- In Saskatchewan, mean Barred Owl home range size was 148.6 ha for the breeding period, 1,234 ha for the non-breeding period, and 970.6 ha annually (Mazur et al 1998).
- In Minnesota, mean Barred Owl mean home range size was 228.6 ha for nine radio-tagged owls in 1965-66, and 354.5 ha for five radio-tagged owls in 1972-73 (Nicholls and Fuller 1987).

5. Territoriality

- In Minnesota, Barred Owls maintained nearly exclusive home ranges with little overlap (Nicholls and Fuller 1987).
- In Washington, mean Barred Owl overlap of adjacent home ranges was 0.7 percent (Hamer 1988).
- Nicholls and Fuller (1987) also found that Barred Owl home range boundaries remained similar when new owls replaced former occupants, and that similar boundaries for territories persisted from one decade to the next.

5. Territoriality (cont.)

- Barred owls were also found to vocally advertise occupancy and to repel intruders and neighbors.
- Both studies found that when a Barred Owl encroached into an adjacent owl's territory, it was generally of short duration.

Behavioral encounters

Behavioral encounters between Spotted and Barred Owls have been observed on many occasions during survey (Iverson 1993, Herter pers. com., Flemming pers. com, pers. obs.). In most cases, but not all, Barred Owls appeared to be dominant as evidenced by the Spotted Owls leaving the area or becoming silent. During several encounters, Pearson had observed Spotted Owls employ a subdued, 6-10 note call, quite different from other standard calls.

Behavioral encounters (cont.)

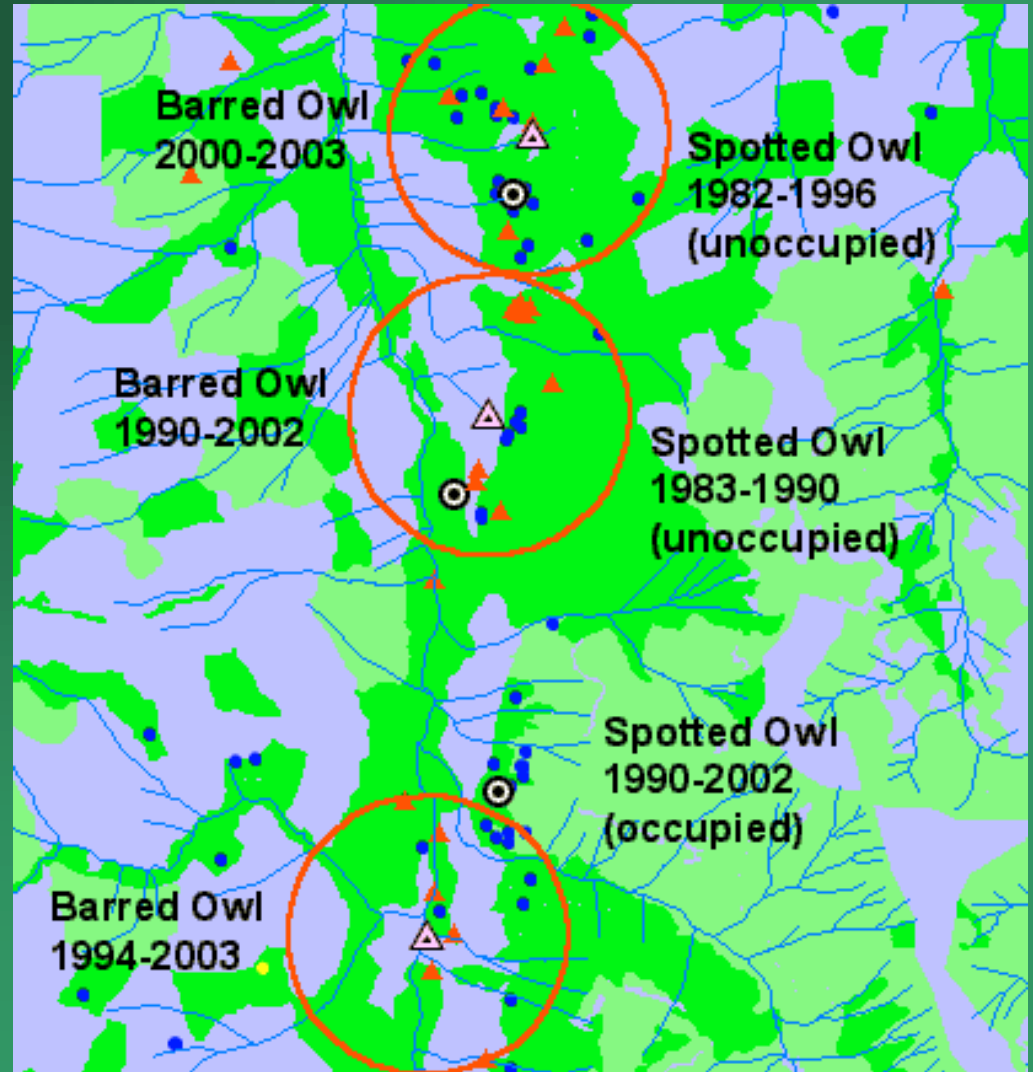
Most observed behavioral encounters are the result of survey efforts where the Spotted Owl responds to surveyor calling. A question then is whether such encounters are as common without the artificial inducement of survey: do sympatric Spotted and Barred Owls adjust to boundaries and avoid confrontations?

Potential competition and displacement

Barred Owls and Spotted Owls have home ranges with similar habitat characteristics, their prey species overlap considerably, they have similar nesting requirements, and they exhibit territorial behavior toward one another. This combination of behaviors strongly indicates competition. While there may be some partitioning of resources, simple occupancy and defense of a Barred Owl territory would exclude access to some extent to resources within that territory to Spotted Owls.

Potential competition and displacement

Potential competition and displacement for three Spotted Owl pairs associated with three Barred Owl pairs (circles 0.8-km).



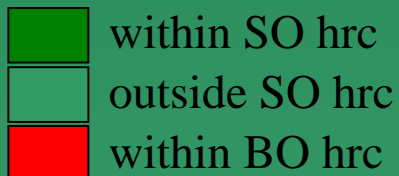
Habitat considerations for territorial Spotted Owls: availability

Suitable Spotted Owl habitat within a Barred Owl territory is still physically present, but it is not necessarily available for use by territorial Spotted Owls. Barred Owls have been found to maintain and rigorously defend consistent territorial boundaries over time. It is unlikely that a Spotted Owl pair could initiate a territory within an established Barred Owl territory. Suitable Spotted Owl habitat within a Barred Owl territory should then be classified as “unavailable” suitable habitat.

Habitat considerations: availability

Habitat within
Barred Owl
territories is likely
unavailable for
use as a Spotted
Owl territory.

Forest ≥ 80 years old



Habitat considerations (cont.)

- At the landscape level, population models that do not take Barred Owl presence into account will overestimate the number of territorial Spotted Owls that can be supported.
- Example: Woods Creek Late-Successional Reserve which contains 5,429 ha of forest \geq 80 years old (of which 4,494 ha is \geq 130 years old), which would roughly equate to suitable Spotted Owl habitat.
- Historically contained nine Spotted Owl pairs but with Barred Owl presence the number supported has been reduced to three at most.

Habitat considerations (cont.)

Woods Creek LSR

Overlap of Suitable Spotted Owl habitat by Barred Owl circles of 0.8-km (202 ha)(dark red) and 1.29-km (526 ha) (light red). Green is habitat not overlapped by Barred Owl circles.



Habitat considerations (cont.)

- At the individual level, assessments of habitat within analysis core and home range circles that do not take Barred Owl presence into account may overestimate the amount of habitat available to territorial Spotted Owls.
- Timber sales that reduce suitable habitat levels near the accepted minimum levels necessary to support a Spotted Owl pair, may in effect reduce levels below minimum if a Barred Owl pair is nearby, excluding use of habitat (unavailable habitat).

Non-territorial and nomadic territorial owls

Nomadic territorial owls were defined by Hamer et al. (1989) as Spotted Owls that “...leave their summer ranges in late fall and travel to a separate winter range, returning to the original summer range in late spring.” Hamer et al. (1989) found that in each case ($n=4$) where a territorial owl had a separate winter range (nomadic), a resident pair of Barred Owls was also found inhabiting the area. He also found in one case that the home ranges of eight different Barred Owls were overlapped or encompassed by a female Spotted Owl's home range.

Non-territorial and nomadic territorial owls

- Non-territorial owls (floaters) tend to remain silent (Thomas et al. 1990) and generally would not be detected during standard protocol survey, making estimation of numbers difficult.
- Rohner (1997) found for Great Horned Owls in southwestern Yukon, Canada that floaters comprised up to 40-50 percent of the overall population during peak densities of their main prey, the snowshoe hare (*Lepus americanus*).

Non-territorial and nomadic territorial owls

Rohner (1997) also found for Great Horned Owls that:

- Floaters overlapped territories with each other as well as with territorial owls.
- Great Horned Owl floaters were secretive, had fairly stable home ranges, with a space use similar to territorial owls, and the main difference was that floaters had a mean home range that was about five times larger than territorial owls.

Non-territorial and nomadic territorial owls

If the nomadic, non-territorial and juvenile Spotted Owls spend time within Barred Owl home ranges, as seems likely, then the “unavailable” suitable and dispersal Spotted Owl habitat within Barred Owl territories would be important to retain.

An additional consideration in habitat assessment should be the potential for non-territorial Barred Owls.

Can Spotted and Barred Owls coexist?

Of 55 historical Spotted Owl sites on the Cowlitz Valley Ranger District, Gifford Pinchot National Forest, WA, that had a Barred Owl detection within 0.8 km of their site-center, 12 became unoccupied (no detections for five years) sometime after a Barred Owl was detected and 43 sites remained active in 2003.

Can Spotted and Barred Owls coexist?

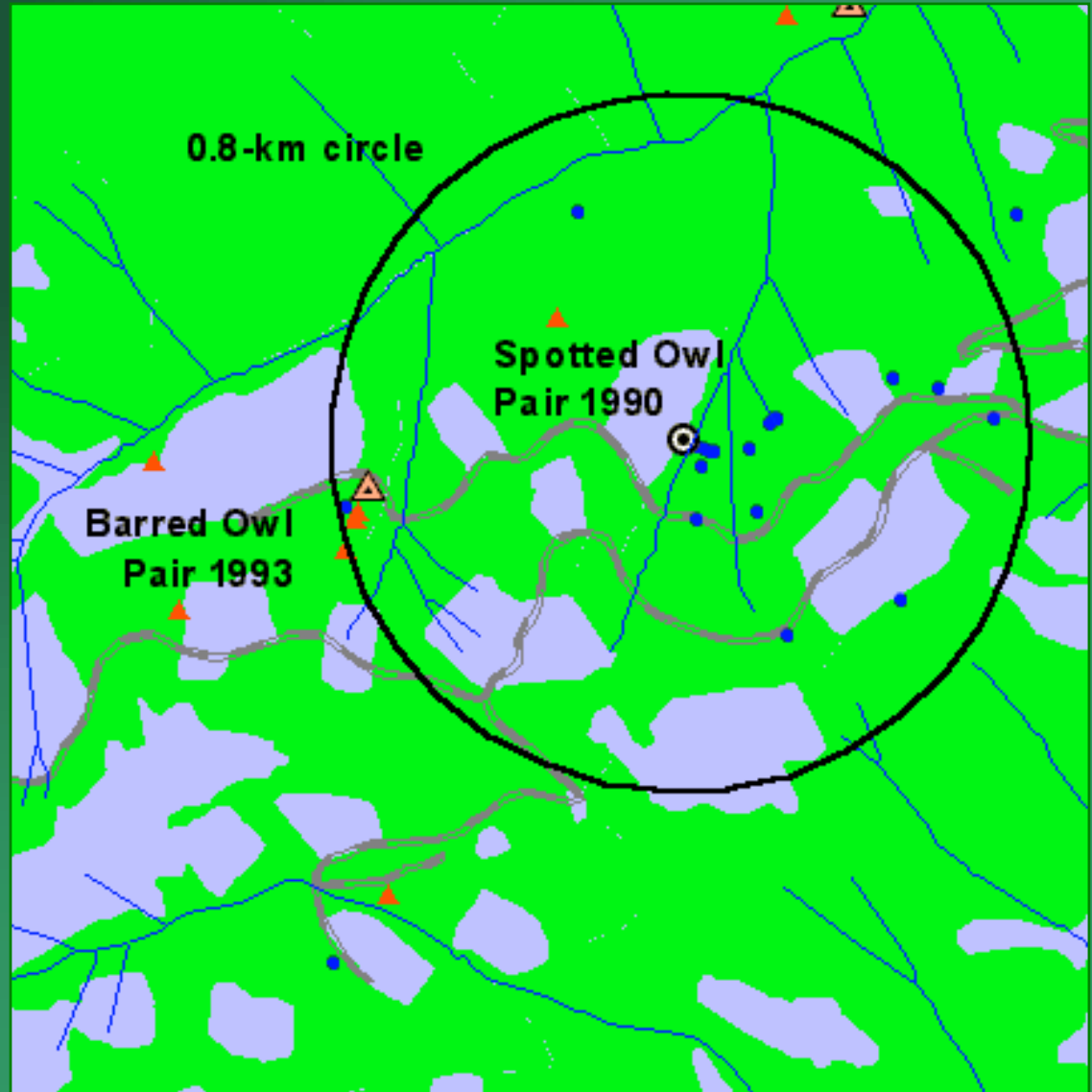
- Two Spotted Owl sites had associated Barred Owl presence for 14 years, and another two Spotted Owl sites had associated Barred Owl presence for 11 years. In all four cases, the adjacent Barred Owl presence was a pair site.

Examples of proximity over time

11 years

Spotted Owl
1990-2003
blue dots

Barred Owl
1993-2003
red triangles

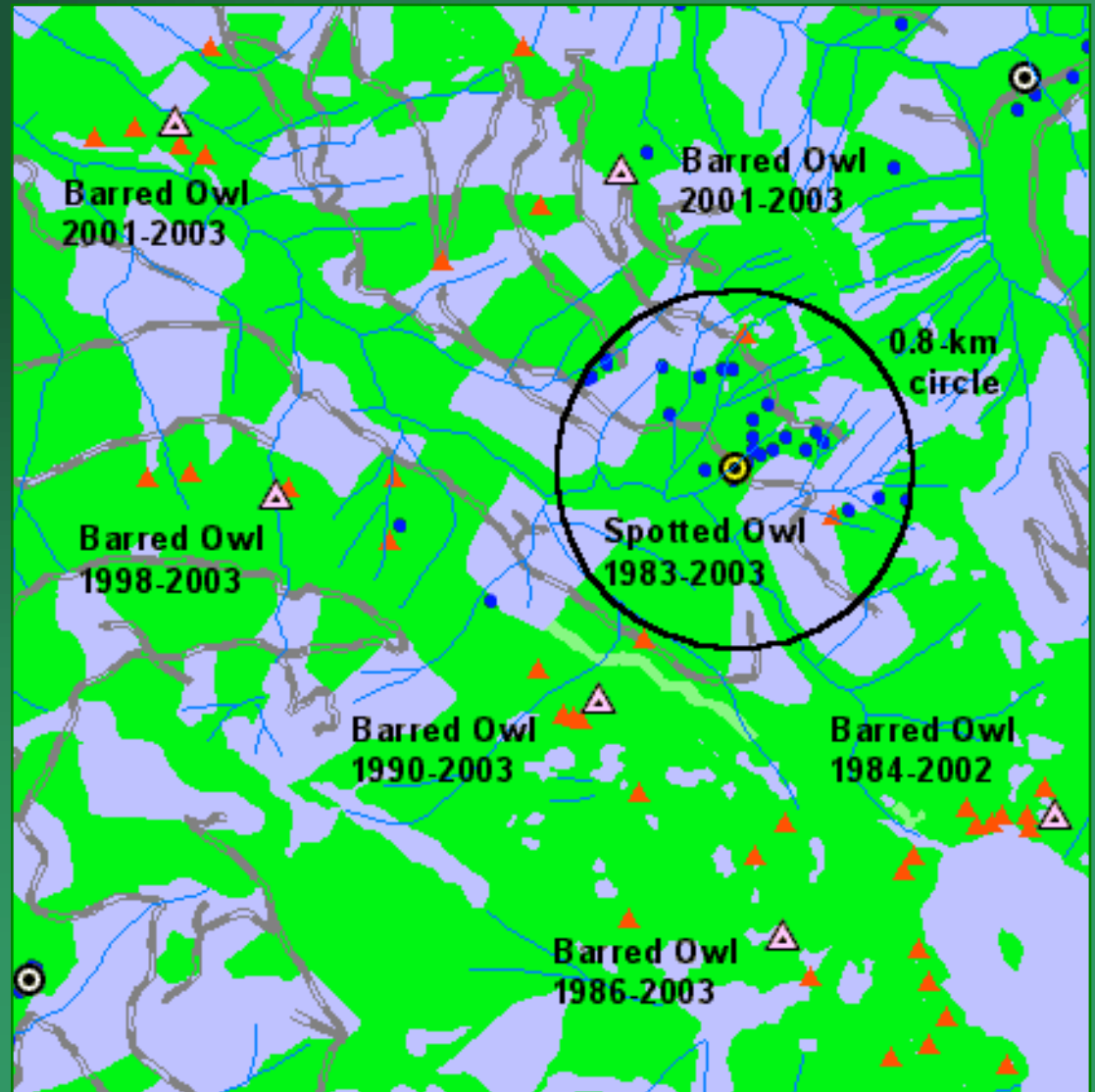


Examples of proximity over time

Spotted Owl
1983-2003
reproduced in
89, 90, 94, 96, 00

6 Barred Owl
sites:

84-02, 86-03,
90-03, 98-03,
01-03, 01-03



Barred Owl unoccupied sites

Over time on the Cowlitz Valley Ranger District, identified Barred Owl sites have also apparently become unoccupied. Most notable was a reproducing pair that was detected for the first time in 1998, and was never detected there again with repeated yearly checks. Another pair site that had presence detected over a span of seven years has not been detected for the last seven years. Other examples suggest that Barred Owl site occupancy in certain areas is a changing and ongoing process.

Conclusions

- Barred Owl numbers are likely underestimated
- Spotted Owl habitat assessment should account for Barred Owl presence to prevent:
 - Overestimation of Spotted Owls that can be supported on a landscape level
 - Underestimation of available habitat on a local level
- Potential capability for coexistence needs to be examined