Appendix A—Senior Analysts for 2004 Northern Spotted Owl Population Status and Trend Workshop

Name	Affiliation
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Dr. Robert G. Anthony	U.S. Geological Survey, Corvallis, OR
Dr. Kenneth P. Burnham	U.S. Geological Survey, Fort Collins, CO
Dr. Eric Forsman	USDA Forest Service, Pacific Northwest Research Station, Corvallis, OR
Dr. Alan B. Franklin	Colorado Cooperative Fish and Wildlife Research Unit, Fort Collins, CO
Dr. James E. Hines	U.S. Geological Survey, Laurel, MD
Dr. James Nichols	U.S. Geological Survey, Laurel, MD
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Frank Oliver

Appendix B—Nearest Neighbor Analysis of Owl Presence Data

A nearest neighbor analysis was performed on owl presence location data for each physiographic province to provide an index of spatial distribution for the point data. Preliminary steps included resampling the presence data grids (25-m pixel resolution) into 1-mi-square pixel resolution grid data sets. This was performed because we were interested in determining the overall distribution patterns of presence data across a large geographic area (the province), and situations where multiple points (separated by hundreds of feet) represented a single owl pair within an individual forest stand (a situation that sometimes occurred with demographic data) would provide too much detail resulting in erroneous distribution statistics.

The analysis was conducted in ArcView Spatial Analyst, by using the Animal Movement extension (v2.0) by Hooge and Eichenlaub (2000). The nearest neighbor analysis calculates a series of descriptive statistics of the animal-location point patterns. It tests for complete spatial randomness by using a selected polygon shapefile. It implements the Clark and Evans (1954) algorithm. The R-value relates to how clustered or dispersed points are within the polygon specified (in our case the physiographic province boundary and the habitat-capable land within it) (table B-1). An R-value of less than 1 indicates that the points have a tendency toward a clumped (clustered) pattern, an R-value of 1 indicates a random distribution, and an R-value of greater than 1 indicates an organized (uniform) pattern. The possible range of R-values is 0 to 2.15, where a value of 0 represents maximum aggregation, and 2.15 represents perfect uniformity.

These statistics indicate slightly clumpy spatial patterns of owl presence location data in most physiographic provinces. The pattern is randomly distributed in the California Klamath province and slightly uniform in Oregon Western Cascades province. Level of "clumpiness" diminishes slightly when point patterns are analyzed within the context of habitat-capable land within the province. The following figures show graphic representations of the presence data distributions by state and province (figures B-1 through B-3).

References

Clark P.; Evans, F.C. 1954. Distance to the nearest neighbor as a measure of spatial relationship in populations. Ecology. 35: 445–453.

Hooge P.N.; Eichenlaub, B. 2000. Animal movement extension to ArcView, 2.0., Anchorage, AK: Alaska Science Center—Biological Science Office, U.S. Geological Survey.

Table B-1—Spatial distribution indices for owl presence location data used for modeling habitat

		R-values		z-values	
Physiographic province	n	Province boundary	Habitat-capable lands	Province boundary	Habitat-capable lands
Washington Olympic Peninsula	642	0.72	0.76	-7.81	-9.59
Washington Western Cascades	405	.73	.81	-6.89	-10.16
Washington Eastern Cascades	712	.62	.78	-7.11	-12.98
Oregon Coast Range	1,564	.74	.77	-11.52	-13.15
Oregon Western Cascades	2,382	1.03	1.07	4.87	2.01
Oregon Eastern Cascades	549	.81	.86	-3.69	-5.09
Oregon Klamath	697	.90	.92	-3.84	-4.77
California Cascades	77	.80	.84	-2.55	-3.34
California Klamath	893	.99	1.02	1.25	-.75
California Coast Range	1,046	.88	.92	-4.42	-7.15

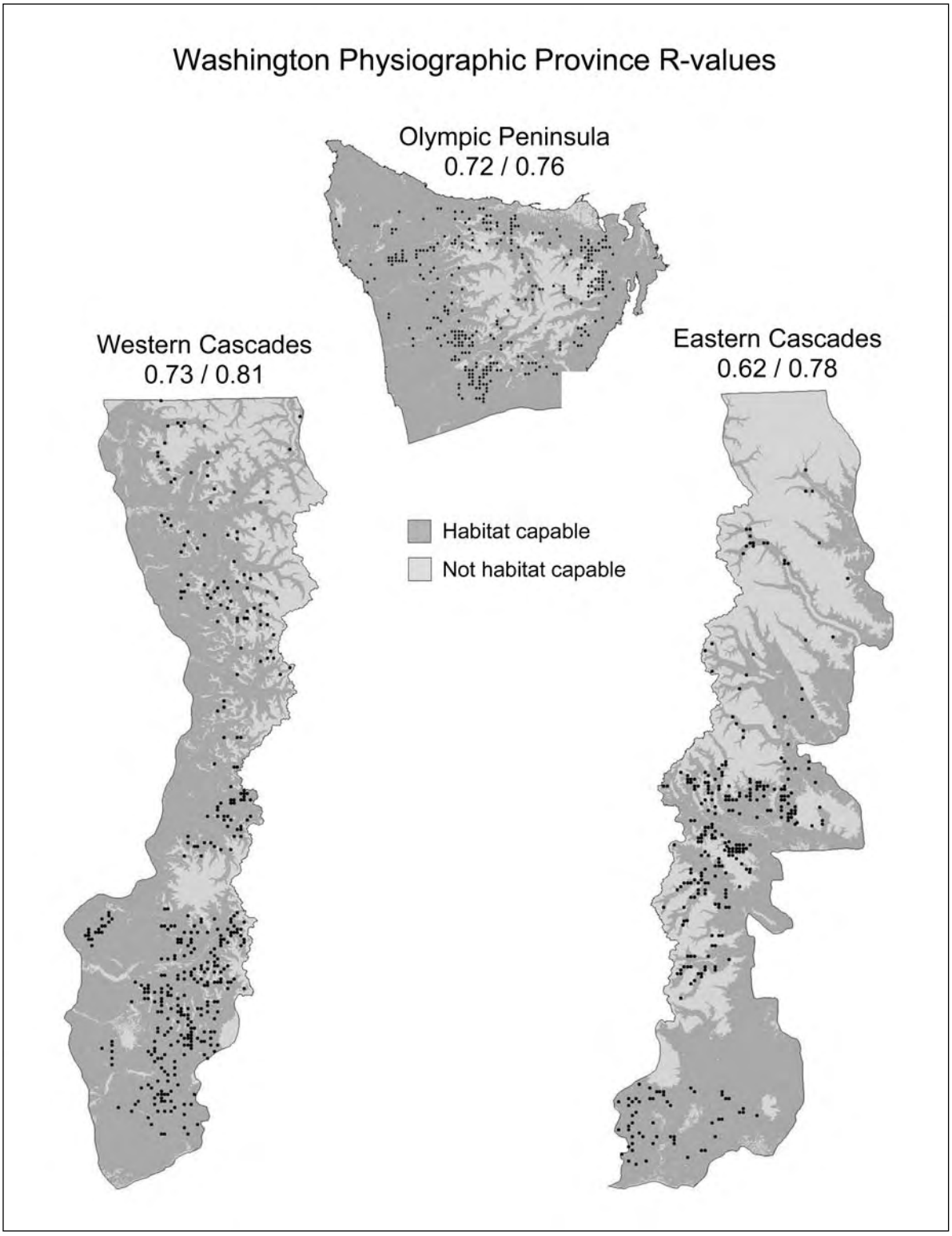

Figure B-1—Owl presence for Washington physiographic provinces. The R-values for both the province and habitat-capable lands within it are shown above the province (province/habitat capable).

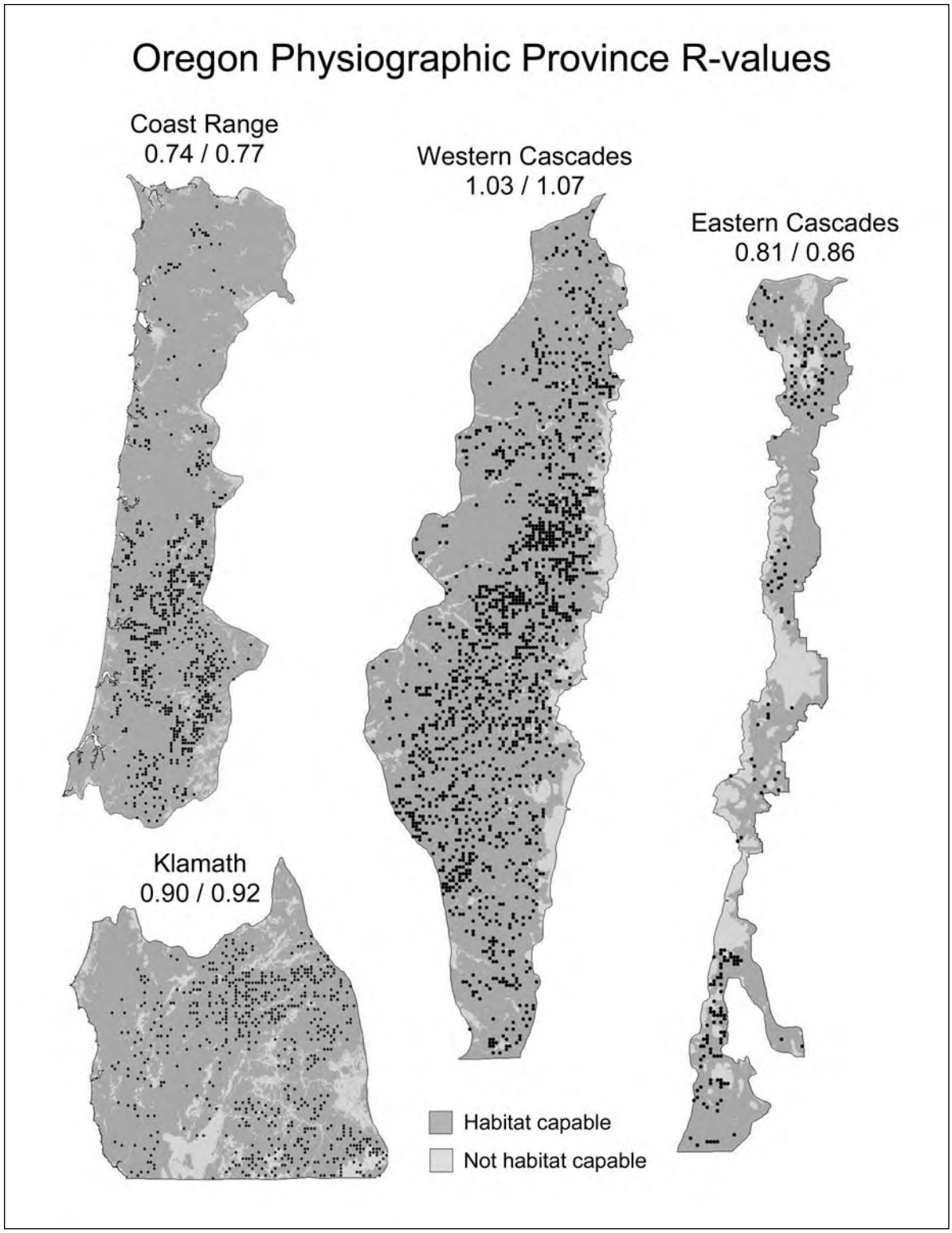

Figure B-2—Owl presence data for Oregon physiographic provinces. The R-values for both the province and habitat-capable lands within it are shown above the province (province/habitat capable).

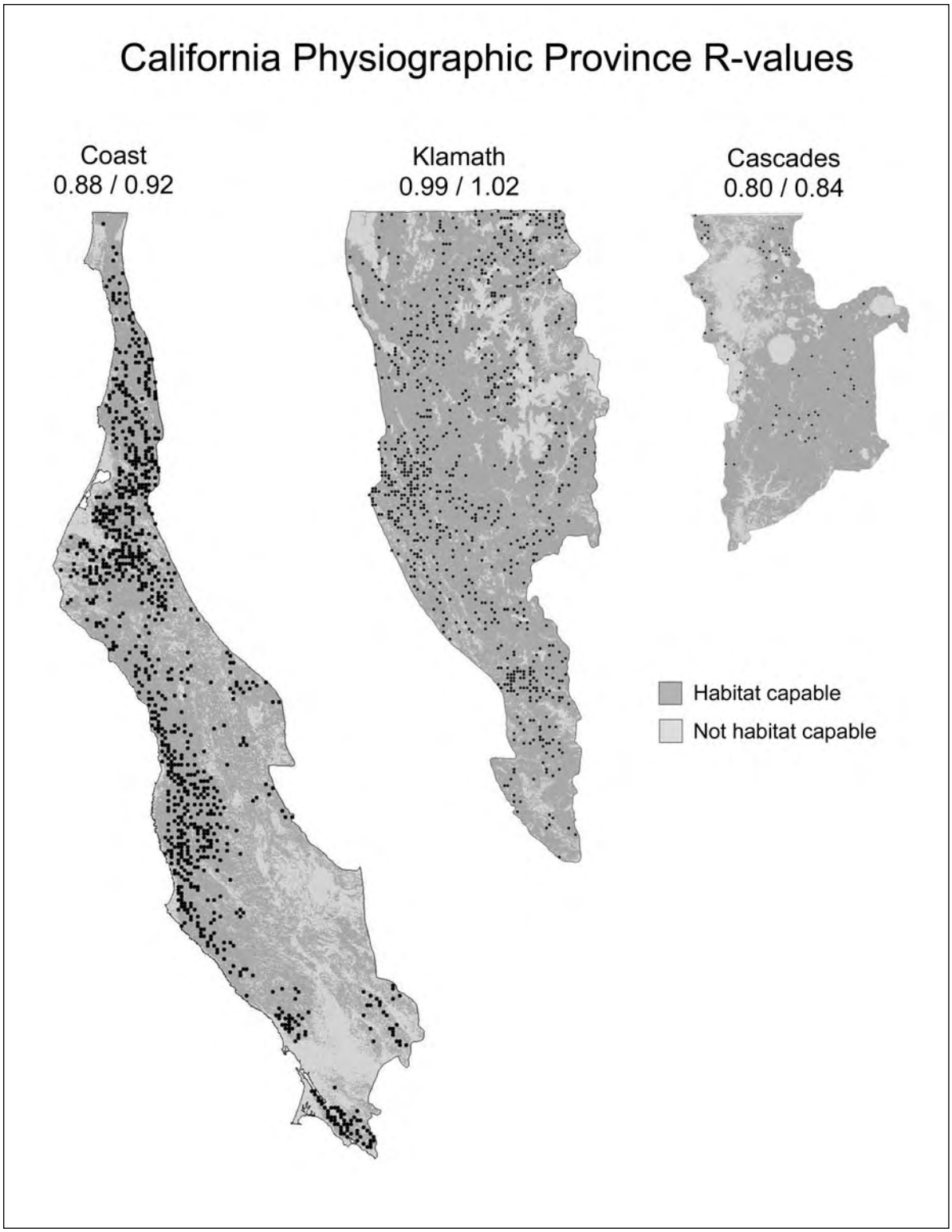

Figure B-3—Owl presence data for California physiographic provinces. The R-values for both the province and habitat-capable lands within it are shown above the province (province/habitat capable).

Appendix C—Habitat Variables Used in BioMapper Modeling

Variable	Description	Range of values
qmd	Quadratic mean diameter: Diameter at breast height of dominant and codominant trees of average basal area	Continuous integer values in 1-inch increments from 0 to 75 inches in Oregon and Washington with the exception of the east Cascade and California provinces, where the mean of vegetation-strike-team size classes were used (e.g., 2, 7, 15…55 inches)
cc	Canopy cover of coniferous trees	Continuous integer values in 1-percent increments from 0 to 100% in Oregon and Washington and using the mean of the 10% increments from 0 to 100% in California (e.g., 5, 15, 25…95%)
qmdcc	Index of the product of conifer tree size and canopy cover [(qmd × cc)/10]: A small value indicates small-diameter trees or an open canopy and a large value indicates closed canopy of large conifer trees	Continuous integer values from 0 to 750
bdlf	Canopy cover of deciduous trees	Continuous integer values in 1-percent increments from 0 to 100% in Oregon and Washington and using the mean of the 10% increments from 0 to 100% in California (e.g., 5, 15, 25….95%)
variety	An index of stand structure based on the number of vegetation-strike-team size classes within a 5x5 window (25 pixels = 3.9 ac square): Used in Oregon and Washington with IVMP QMD data	Integer values from 1 to 6
struct	Focal mean of discrete-structure values (0 if simple or 1 if complex stand structure) within a 5×5 window (25 pixels = 5.5 ac square): Used only in California because of polygon data issue	Continuous values from 1 to 100 percent
elev	Elevation from USGS digital elevation models	Continuous values in meters

Appendix D—Spotted Owl Habitat Suitability Maps

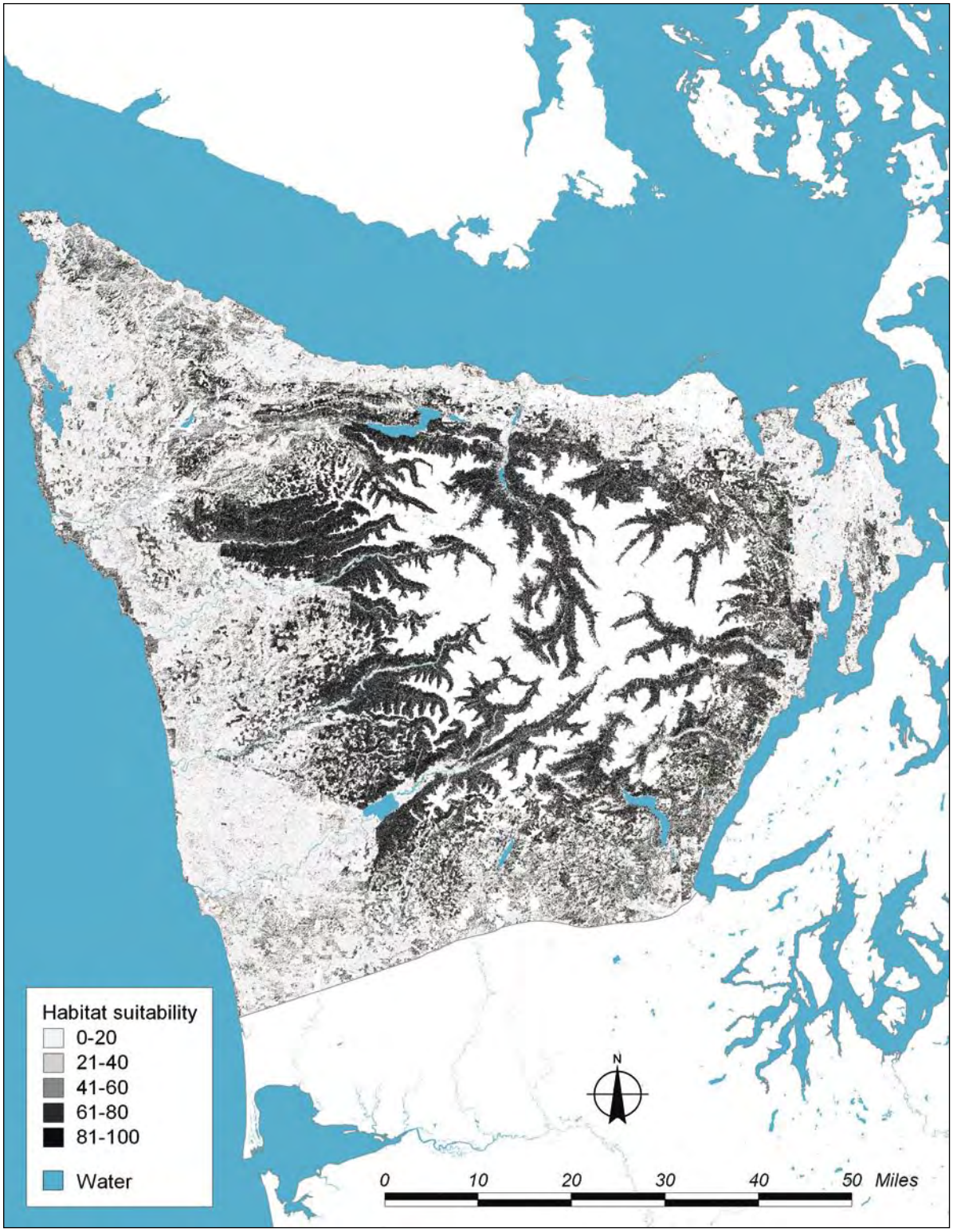

Figure D-1—Spotted owl habitat suitability for habitat-capable lands in the Olympic Peninsula province in Washington.

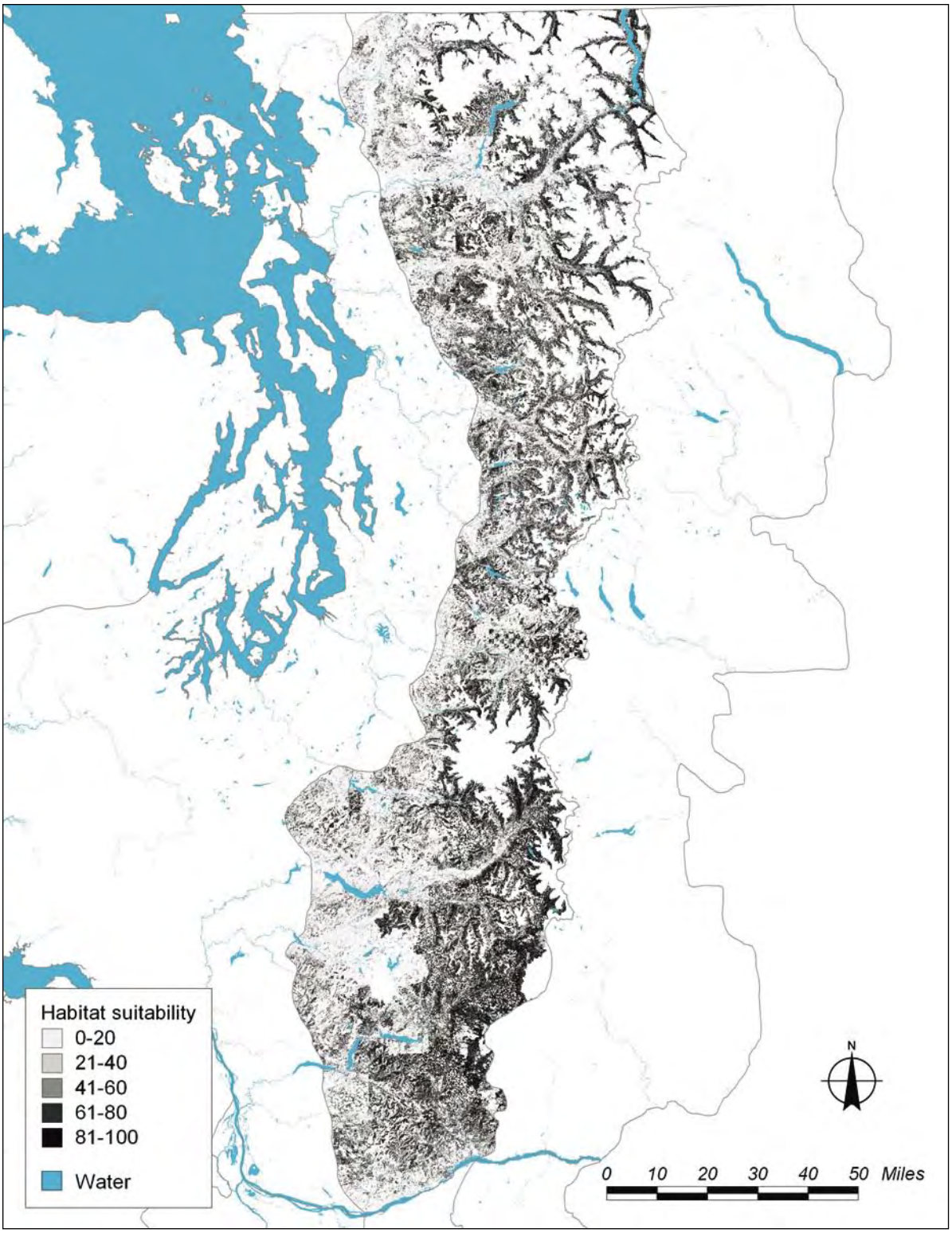

Figure D-2—Spotted owl habitat suitability for habitat-capable lands in the Western Cascades province in Washington.

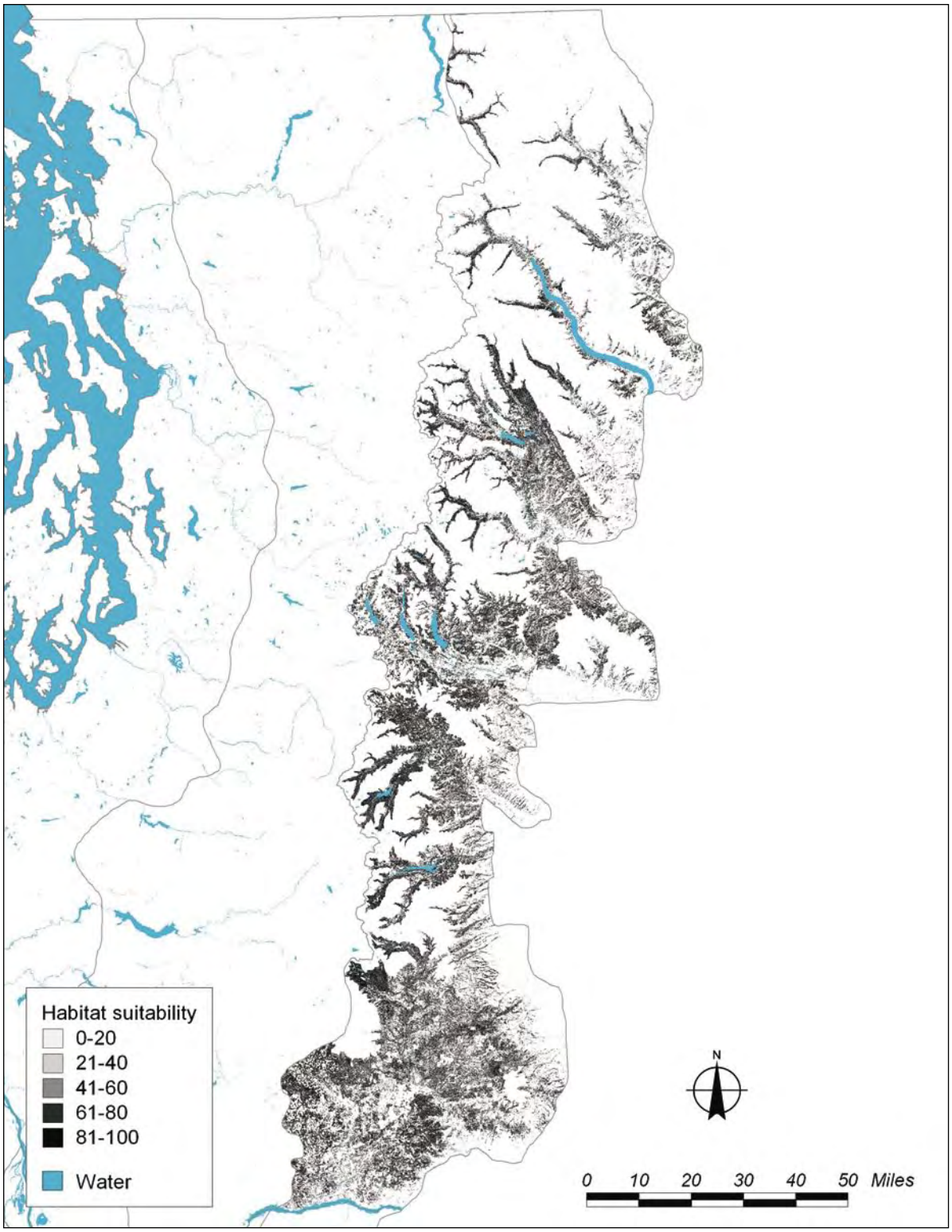

Figure D-3—Spotted owl habitat suitability for habitat-capable lands in the Eastern Cascades province in Washington.

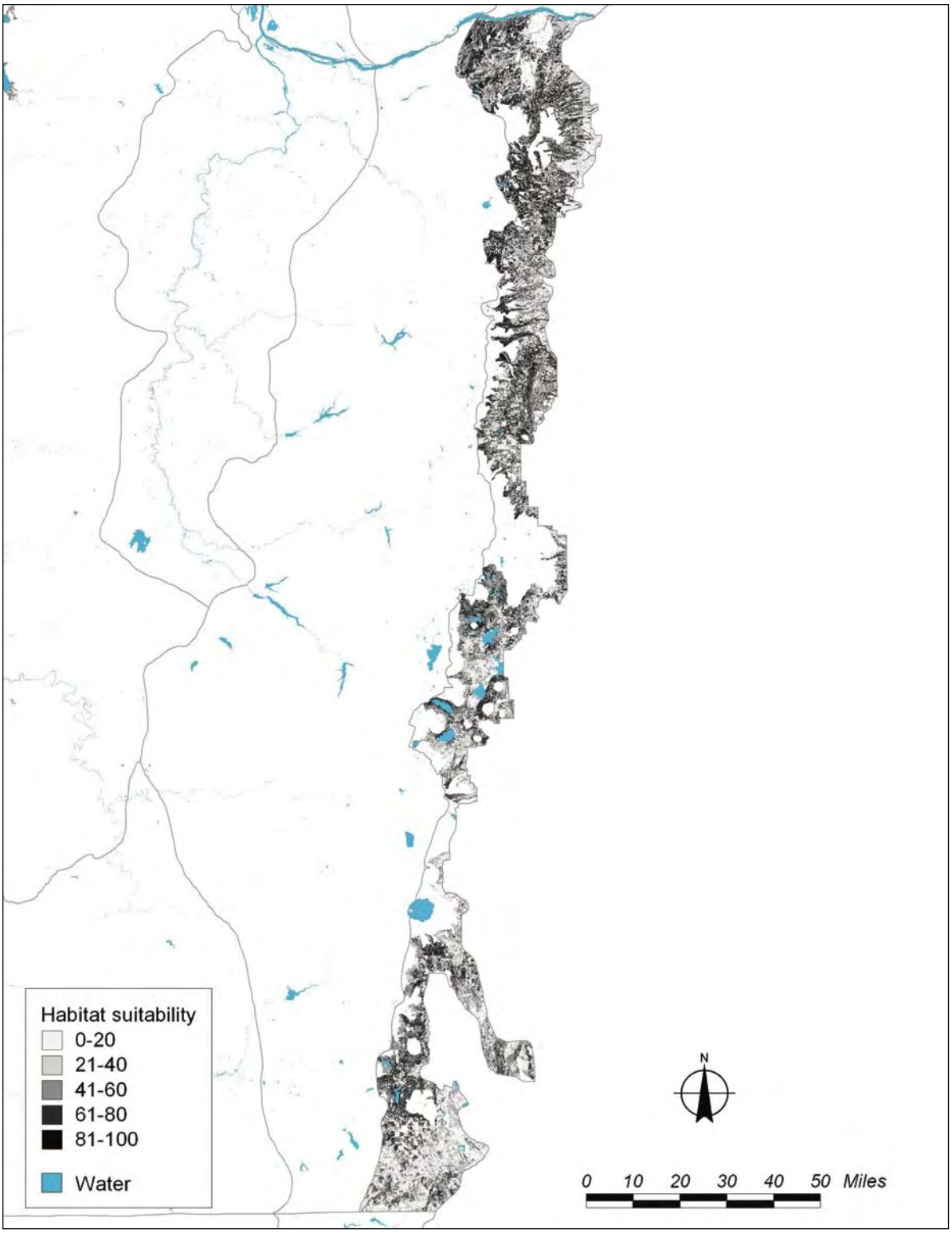

Figure D-4—Spotted owl habitat suitability for habitat-capable lands in the Eastern Cascades province in Oregon.

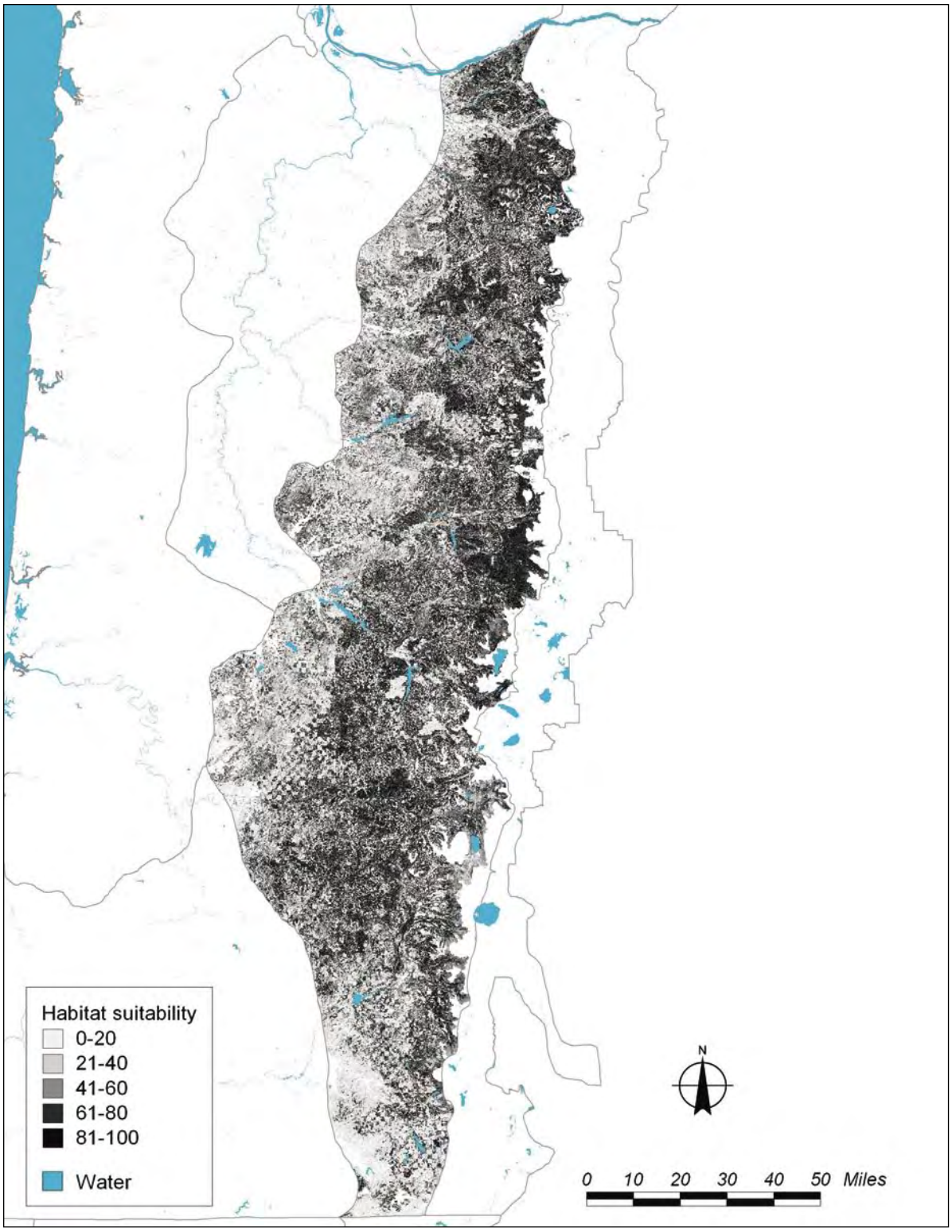

Figure D-5—Spotted owl habitat suitability for habitat-capable lands in the Western Cascades province in Oregon.

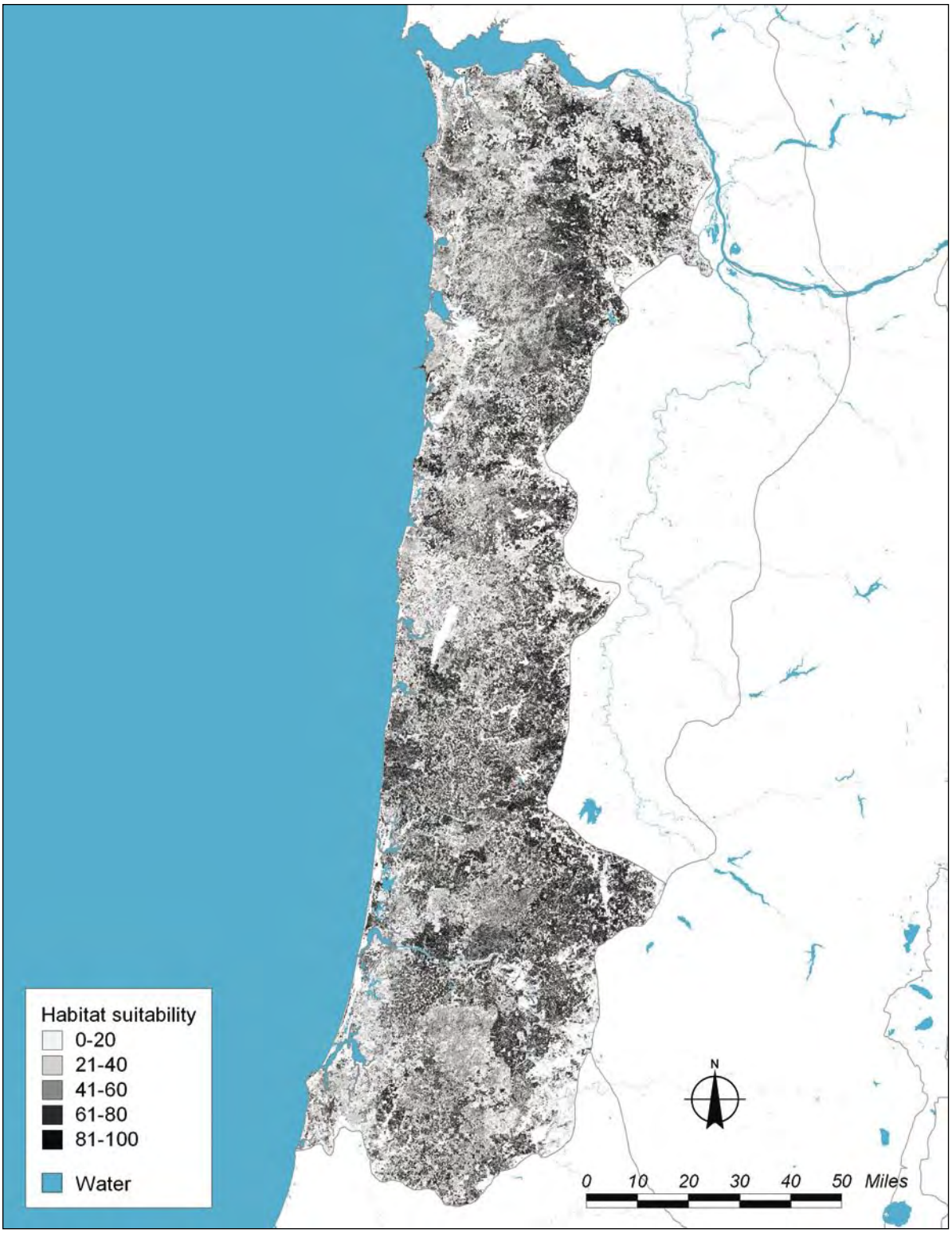

Figure D-6—Spotted owl habitat suitability for habitat-capable lands in the Coast Range province in Oregon.

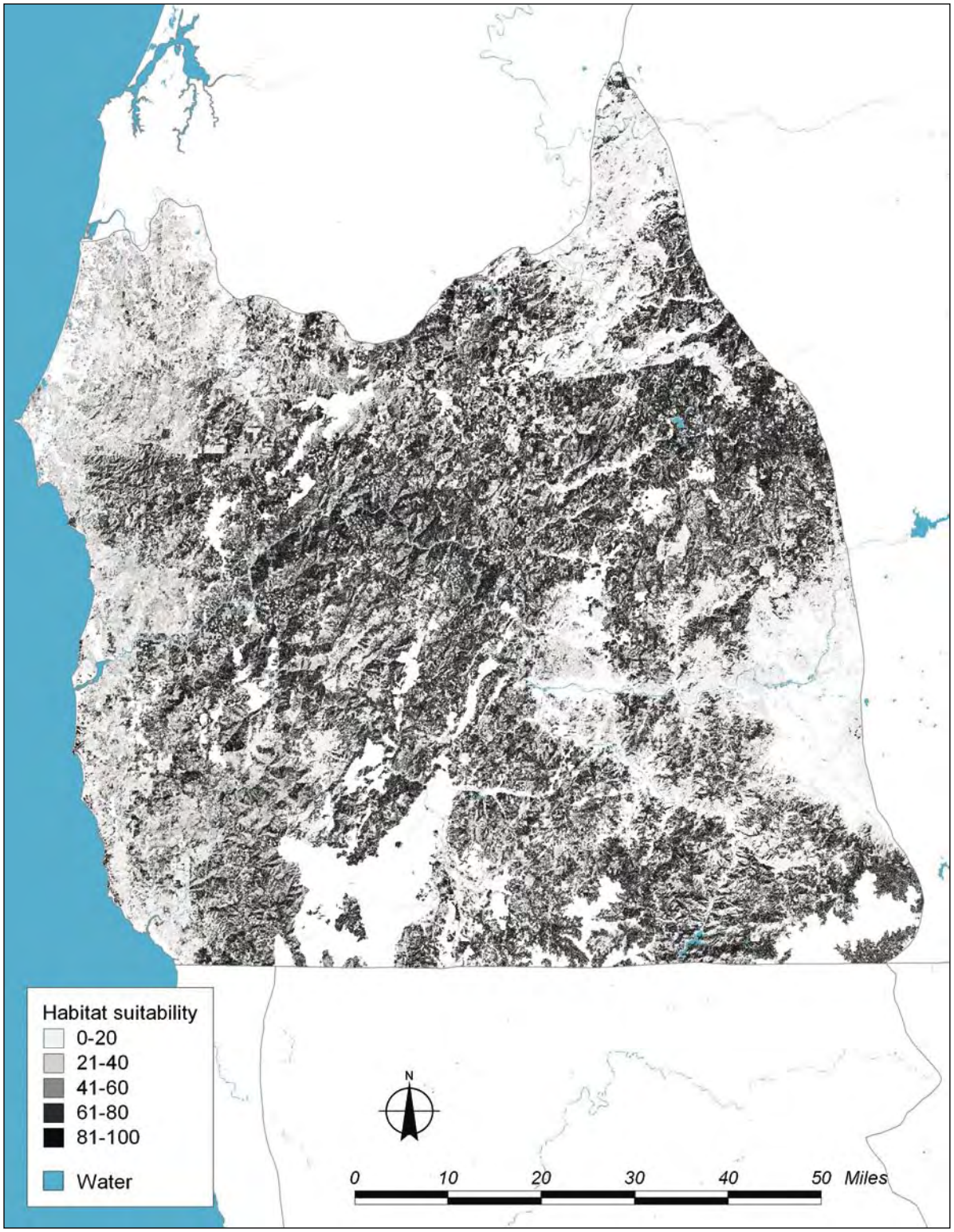

Figure D-7—Spotted owl habitat suitability for habitat-capable lands in the Klamath province in Oregon.

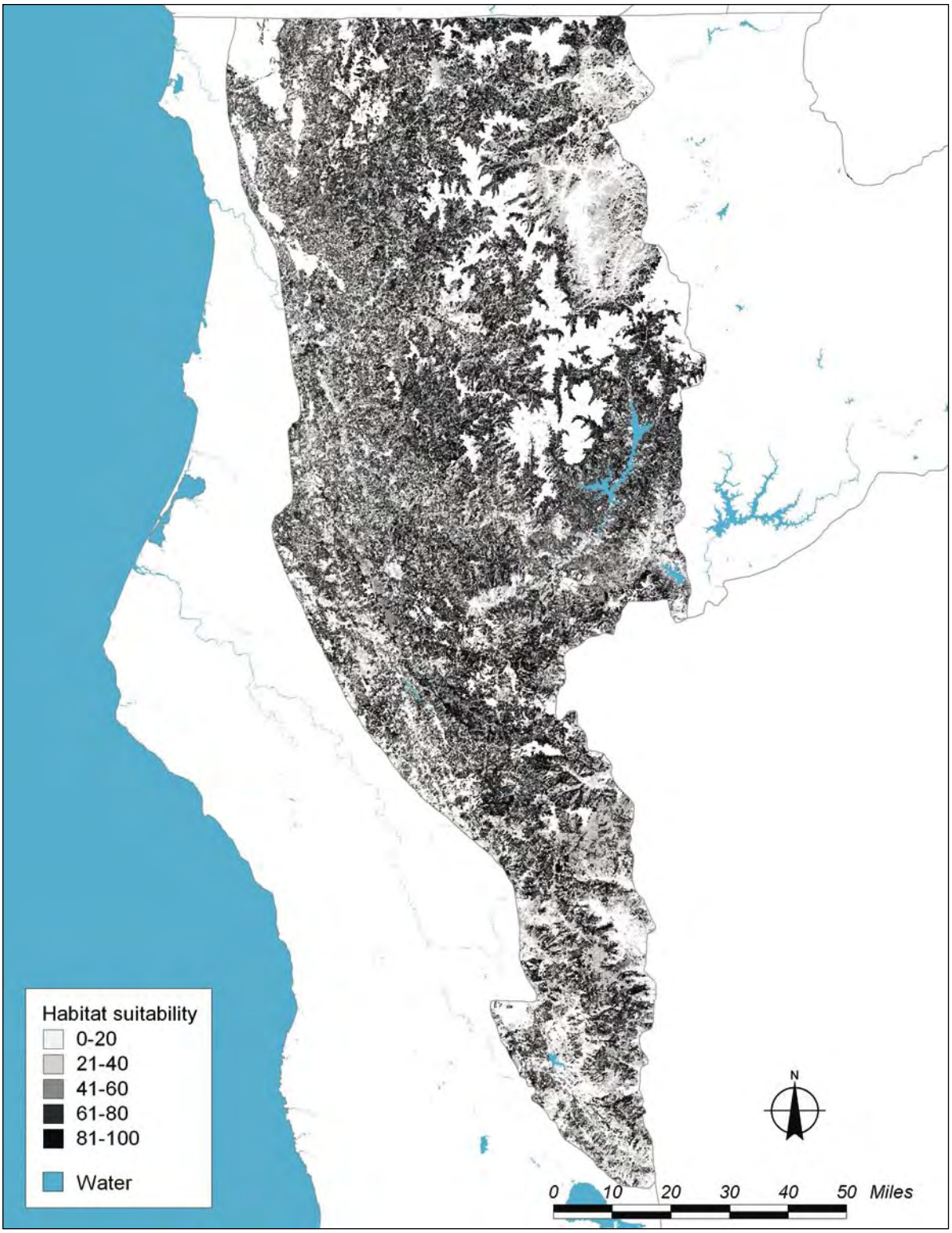

Figure D-8—Spotted owl habitat suitability for habitat-capable lands in the Klamath province in California.

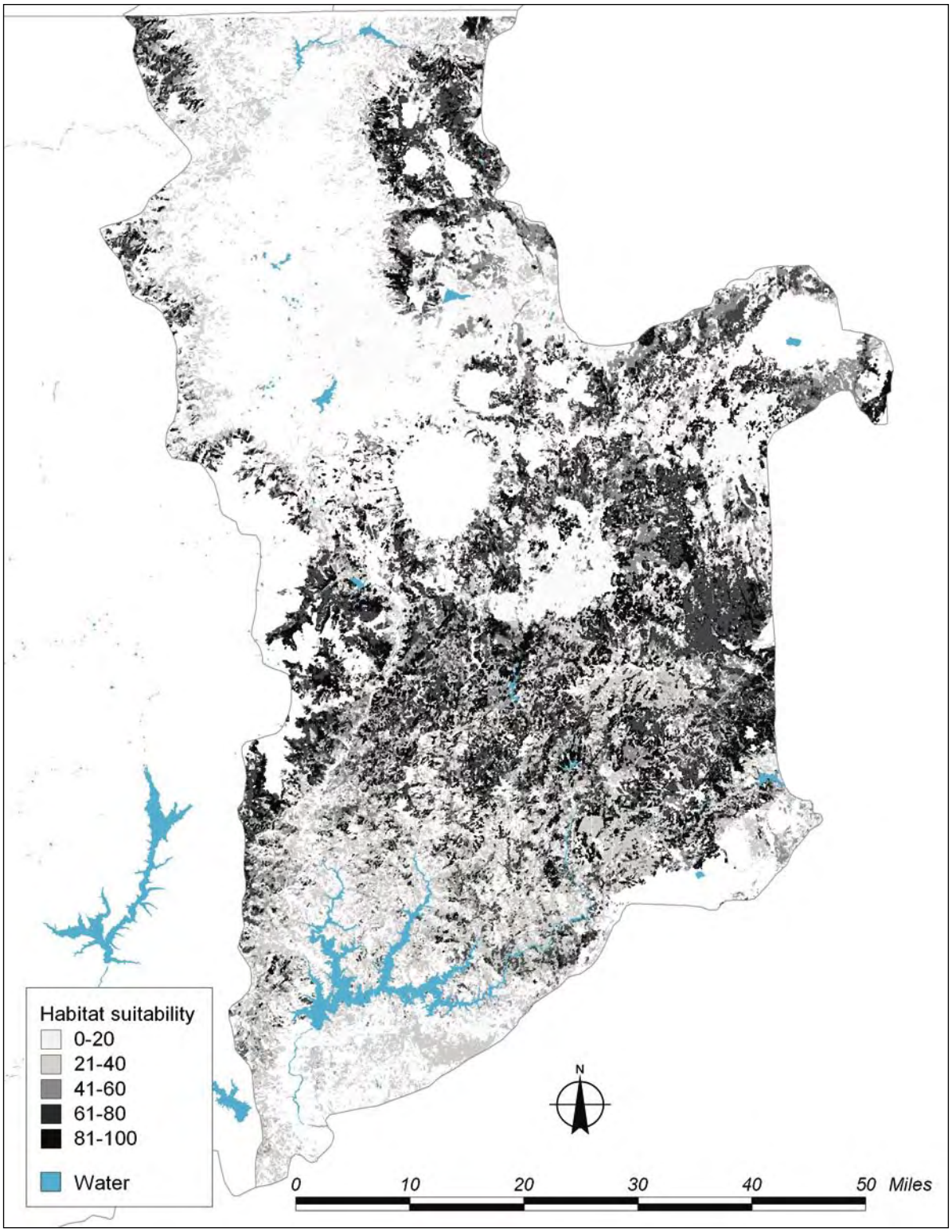

Figure D-9—Spotted owl habitat suitability for habitat-capable lands in the Cascades province in California.

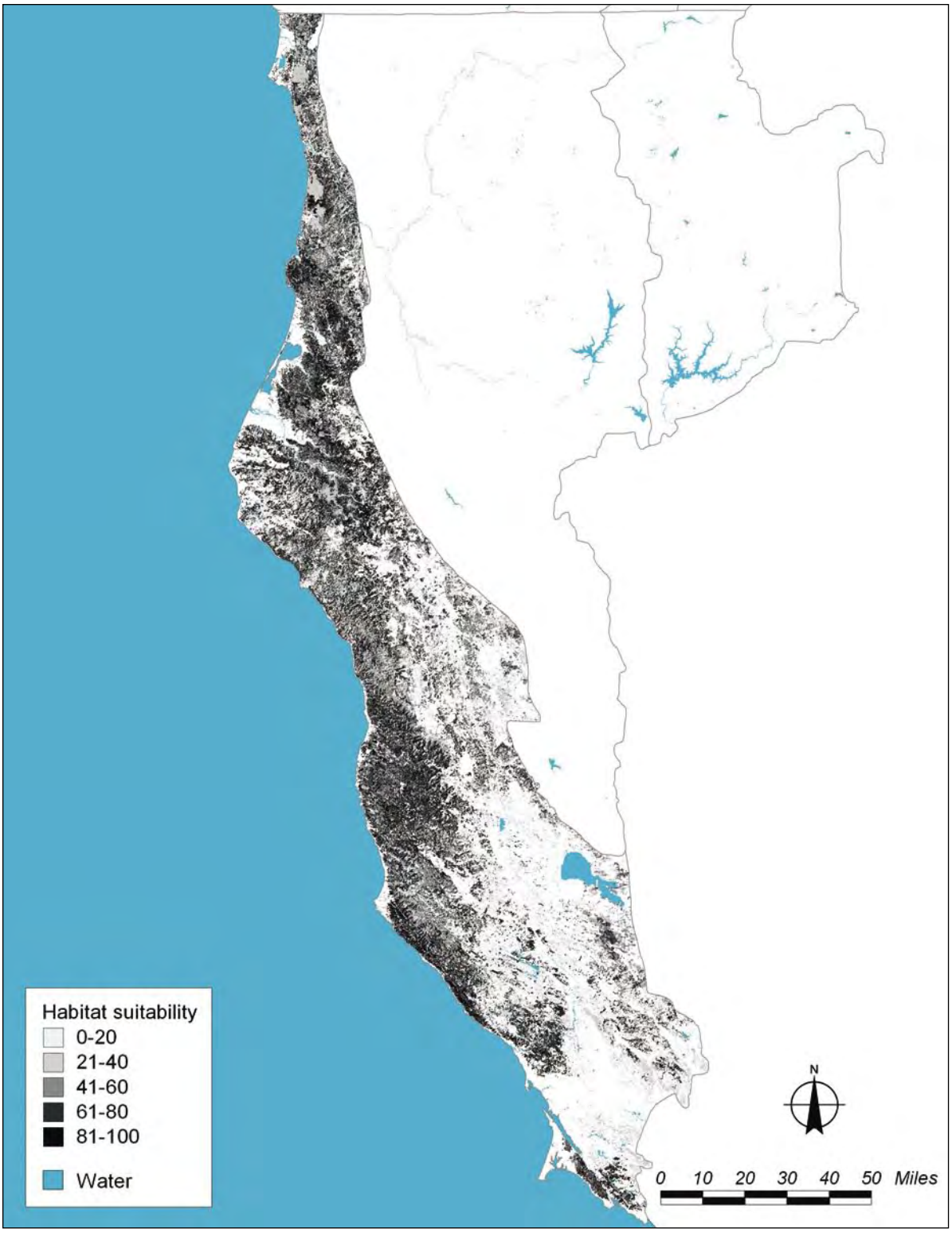

Figure D-10—Spotted owl habitat suitability for habitat-capable lands in the Coast province in California.

Continue to Appendixes E through I