

presented substantial scientific or commercial information to indicate that listing the California spotted owl may be warranted, and we requested information and data regarding the species. On July 31, 2001, the Center for Biological Diversity and others filed a complaint in District Court, alleging the Service failed to make a timely 12-month finding in response to their listing petition. On March 5, 2002, the District Court entered an order requiring the completion of the 12-month finding by February 10, 2003.

#### *The Petition*

The petitioners believe that listing the California spotted owl is necessary because of factors related to loss and modification of habitats from timber harvest and urbanization, lack of existing State or Federal regulatory mechanisms that protect the species, and declines in the population.

The petitioners believe listing is necessary primarily because past timber harvest in the Sierra Nevada has resulted in the loss of key components of spotted owl habitat over large portions of the landscape. They also believe that current Federal land management agency strategies and private land forest practices are resulting in the loss or destruction of spotted owl habitat. They expressed special concern about past timber harvest practices that selectively removed the larger, older trees that comprise a key component of spotted owl breeding habitat.

The petitioners refer to the "Interim Guidelines" of the Federal land management strategy in place at the time the petition was submitted (April 2000) to conclude that current and planned timber sales would continue to remove key components of spotted owl habitat. The petitioners believe the cumulative effects of continued timber harvest and fuels reduction projects on Federal lands would have dramatic effects on the spotted owl.

The petitioners state, " \* \* \* there are almost no protections for spotted owls \* \* \*" on private lands. They assessed the State mechanism for permitting timber harvest and analyzed recent timber harvest plans to conclude, " \* \* \* owls are being heavily impacted by logging on private lands." Additional evidence of habitat destruction cited by the petitioners includes urbanization and development, particularly loss of habitat at lower elevations from new home construction.

The petitioners cite recent studies that report potential population declines as further evidence to support a positive listing decision. The petitioners review

and interpret several studies of California spotted owl population dynamics to infer "drastic" annual declines in the population.

Other impacts addressed in the petition include livestock grazing, recreation, climate change, fire, competition from the barred owl, and disease and predation. These are impacts thought by the petitioners to be apparent, though not well studied or documented.

#### *Taxonomy and Description*

The spotted owl was first described as *Syrnium occidentale* by John Xantus in 1859 based on a specimen collected at Fort Tejon, Kern County, California (Xantus 1859). The species was later reassigned to the genus *Strix* (Ridgway 1914). The specific name was altered to conform to the Code of Zoological Nomenclature, yielding the scientific name *Strix occidentalis* (Service 1993). Currently, the American Ornithologist Union (AOU) recognizes three subspecies of spotted owls: the California spotted owl (*Strix occidentalis occidentalis*), the northern spotted owl (*Strix occidentalis caurina*), and the Mexican spotted owl (*Strix occidentalis lucida*) (AOU 1957).

The spotted owl is mottled in appearance. It has a brown back with white spots and brown barring. The facial disk is pale brown with concentric rings of dark brown, bordered by a ring of dark brown feathers. A conspicuous light-colored "X" is apparent between the eyes above its pale yellowish beak, where "eyebrows" and "whiskers" merge together. Unlike most other owl species, which have yellow eyes, spotted owls have dark brown eyes. Wings and tail are rounded, and all flight feathers are dark brown with light brown cross-bars. Sexes cannot be distinguished by plumage, but can be readily identified by size and vocalization (Verner *et al.* 1992b). Females are usually larger than males, with males weighing 470 to 685 grams (g) (17 to 24 ounces (oz)), and females 535 to 775 g (19 to 27 oz) (Gutiérrez *et al.* 1995). First- and second-year adults can be distinguished by the tips of the tail feathers, which are white and taper to a sharp point until replaced by adult plumage at about 26 months of age (Gutiérrez *et al.* 1995). The spotted owl is the fifth largest species of owl occurring in North America (Verner *et al.* 1992b); It is 41 to 48 centimeters (cm) (16 to 19 inches (in)) in length, with a wingspan of 107 to 114 cm (42 to 45 in) (Center for Biological Diversity 2000).

California spotted owls are lighter brown with slightly larger white spots

than the northern spotted owl. Mexican spotted owls are lighter brown than both the California and northern subspecies, with some individuals having a rare palomino color. The facial disk and upper breast of the Mexican spotted owl contain more white than the other subspecies, and larger white spots add to the perception that they are lighter in color (Gutiérrez *et al.* 1995).

The northern spotted owl was listed as threatened under the Act in 1990 (Service 1990), and the Mexican spotted owl was listed as threatened in 1993 (Service 1993).

#### *Population Genetics*

Three genetic markers (*i.e.*, allozymes, mitochondrial DNA and random amplified polymorphic DNA) have been used to examine the genetic structure of spotted owls. Analysis of allozymes (alternate forms of proteins) supports separation of the Mexican spotted owl from the other two subspecies (Gutiérrez *et al.* 1995). Barrowclough *et al.* (1999) compared the sequences of a fragment of mitochondrial DNA (mtDNA) from 73 individual spotted owls, including samples from all three subspecies and from multiple populations within each subspecies. Their data support the separation of the species into the three currently recognized subspecies. Based on their data, the northern spotted owl appears to have diverged from the other two subspecies, and the California spotted owl later diverged from the Mexican spotted owl. In this study, gene flow appeared relatively high within subspecies and low between subspecies (Barrowclough *et al.* 1999). The authors concluded that gene flow between northern and California spotted owls is a recent and uncommon phenomenon.

Haig *et al.* (2001) used random amplified polymorphic DNA (RAPD) to analyze genetic variation between spotted owls at multiple geographic levels, including between subspecies. They found extremely low RAPD variation in spotted owls, with only 11 of 400 primers showing variation. Their data show genetic separation of Mexican spotted owls from California and northern spotted owls, but do not show separation between the California and northern subspecies. They suggest that the lack of separation between the California and northern subspecies in their data may be due to recent gene flow between subspecies, or due to the low variation of the data. We are also aware that additional research by Haig and colleagues bearing on the question of subspecific distinctions in spotted owls has not yet been published (A. Bowers, U.S. Fish and Wildlife Service, in litt. 2002).