being removed from the lists of endangered and threatened species. This is not a statutory pre-condition to delisting, and is not relevant in light of the Service's finding that Australian regulatory mechanisms are adequate. Neither the HSUS nor any other group or individual petitioned the Service to list these kangaroos on the CITES Appendices when the Service published a Federal Register notice on July 15, 1993 (58 FR 38112) inviting CITES proposals. In addition, neither the HSUS nor any other group or individual commented on the absence of these kangaroos from the proposed list of species to be considered by the Service for possible CITES action, (59 FR 3832, January 27, 1994).

Two comments dealing with the validity of the population estimates were received after the close of the February 18, 1994, comment period and are herein addressed. The first comment alleged that the Caughley correction factors overestimated the number of red kangaroos and the second comment alleged that the Caughley correction factors overestimated the number of gray kangaroos during extended drought conditions. The Service notes that a senior FWS biometrician traveled to Australia in 1990 and evaluated the procedures currently used to estimate kangaroo populations. His assessment, summarized in item A (above), indicates that current surveys are very extensive, properly standardized, well thought out, and that additional work to improve visibility correction factors is ongoing. Results from surveys, listed in Tables 1-4, indicate trends that are interpretable using data that have driven successful kangaroo management programs for over a decade. Further development of sampling procedures, including the additional refining of visibility correction factors, should further improve census data.

Other comments submitted in response to the February 18, 1994, Federal Register notice are also addressed above in this final rule. These comments concern the impact that a meat market might have on the commercial utilization of kangaroos, the belief that staff cuts to the U.S. Customs Service might lead to nefarious activities in commerce, the belief that cruelty is rampant in the harvest of kangaroos, the belief that population data and management activities and trade controls are inadequate in kangaroo management, the argument that harvest quotas should consider all forms of mortality, and the perception that droughts and periodic floods represent substantial hazards to kangaroo populations.

## **Summary of Factors Affecting the Species**

Section 4(a)(1) of the Act and regulations implementing the listing provisions of the Act (50 CFR part 424) set forth the procedures for adding species to or deleting species from the List of Endangered and Threatened Wildlife. A species shall be listed or reclassified on the basis of the best scientific or commercial data available after conducting a review of the species' status with regard to the five following evaluation factors: (A) The present or threatened destruction, modification or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; and, (E) other natural or manmade factors affecting its continued existence.

This final rule is based on an assessment of the five listing criteria within the Act. The assessment considered the present biological status of the three kangaroo species in mainland Australia. The five factors, as they apply to eastern gray kangaroo (*Macropus giganteus*), western gray kangaroo (*Macropus fuliginosus*), and red kangaroo (*Macropus rufus*) are as follows:

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Extensive kangaroo habitats have been lost or seriously degraded where urbanization and several forms of intensive agriculture have occurred. The eastern gray kangaroo has lost important habitats to development and agriculture in eastern Queensland, New South Wales (NSWNPWS 1991a) and throughout Victoria. The species, however, is considered abundant and widespread over large areas of eastern Australia where annual rainfall exceeds 250 mm but has little seasonal trend or where summer rains exceed winter rains (ANPWS 1991b). That publication summarizes habitats for the eastern gray kangaroo as including semi-arid mallee scrub, woodland, and forest. The densities of eastern gray kangaroos are frequently low in the more arid portion of their potential range, where they may be confined to narrow belts of woodland bordering watercourses, and are sometimes high elsewhere. The 1991 density of gray kangaroos, for example, was estimated at about 1 per sq km in arid extreme northwestern New South Wales and averaged more than 10 per sq km on about 125,000 sq km of habitat in mesic northcentral New South Wales

(NSWNPWS 1991b). Caughley, et al. (1987) listed densities for eastern gray kangaroos that were greater than 20 kangaroos per sq km on some transects in extreme southcentral Queensland as determined from 1980-1982 aerial surveys. The western border of the range of the species has apparently moved westward since European settlement because of the establishment of numerous semi-permanent watering points for stock. Pastoral development is considered to have generally favored the eastern gray kangaroo (NSWNPWS 1991a). The action plan for the conservation of Australasian Marsupials and Monotremes (Kennedy 1992) listed an increased geographic range since European settlement for eastern gray kangaroos.

The red kangaroo is considered abundant over much of inland Australia in areas receiving less than 500 mm annual rainfall (ANPWS 1991). The species occurs in mulga and mallee scrub, shrubland, woodland, grassland, and desert. The species seems to prefer open plains with scattered trees or shrubs. The 1991 density of red kangaroos was estimated at less than 3 per sq km in central NSW but at more than 14 per sq km on about 125,000 sq km of habitat in arid extreme northwestern NSW (NSWNPWS 1991a). Caughley, et al. (1987) listed densities greater than 20 per sq km for the red kangaroo on some transects determined from 1980-1982 aerial surveys. Red kangaroos occur in almost a continuous distribution but at varying densities over all the pastoral areas and a large portion of the interior of South Australia. The red kangaroo favors the open but better watered country inside the 2000 km dingo-proof fence in lands used primarily for sheep grazing. Red kangaroo densities are much lower outside the fence (SANPWS 1991). The habitat changes associated with sheep grazing such as closely spaced stock water, the production of shrubland with ephemeral grasses, and the exclusion of the dingo are considered favorable for the red kangaroo. The action plan for the conservation of Australasian Marsupials and Monotremes (Kennedy 1992) listed an increased geographic range since European settlement for the red kangaroo.

The western gray kangaroo occurs across the south of the continent from Western Australia to extreme southcentral Queensland but generally not east of the great divide. This distribution generally corresponds to the area where winter rainfall predominates. Caughley, *et al.* (1987) listed densities greater than 10 per sq km for transects in a relatively small