

coordinators take every available opportunity to provide outreach materials and information to national law enforcement personnel at highway checkpoints in the region. Officers were reminded to contact the provincial wildlife authority if they observed any individual with numerous parrots who did not have authorized certificates of origin and leg bands on the birds (contact information was provided). Unlike in the 1980s, birds can no longer be exported directly from the provinces; all legal exports of blue-fronted amazons from this project are through Buenos Aires.

The provinces participating in the program are responsible for meeting the criteria set forth in the national decrees, and only birds from authorized and inspected properties will be permitted to be exported. We received international trade data from the United Nations Environment Programme-World Conservation Monitoring Centre (UNEP-WCMC) showing that the number of blue-fronted amazons exported from Argentina during 1998 and 1999 closely matched the number of birds that were harvested for the program and certified for export, as reported in the application. Based on the above information, we conclude that the program appears to be adequately implemented and enforced.

Sustainability, effect on wild population number: The blue-fronted amazon is one of the most common amazon species in South America. Although the species is listed in CITES Appendix II, it is not listed in *Birds To Watch 2: The World List of Threatened Birds* (Collar *et al.*, 1994), *Parrots: Status Survey and Conservation Action Plan 2000–2004* (Snyder *et al.*, 2000), or the *2002 IUCN Red List of Threatened Animals* (<http://www.redlist.org>). In their comments to the Division of Management Authority (October 2000), TRAFFIC—North America and TRAFFIC—South America argued that the wild blue-fronted amazon parrot population could sustain the proposed harvest.

The applicant proposes collection of nestlings during the breeding season (December and January) and juvenile birds, which are designated as pests by landowners, on citrus farms in May, June, and July. While the species' range extends over 430,000 km² in Argentina, not all of the range is available habitat. The greatest population densities are within an area of 200,000 km², and the area subject to management that contains optimal roosting, foraging, and nesting areas is 170,000 km² in the Provinces of Chaco, Formosa, Jujuy, and Salta (Moschione and Banchs, 1993).

Sampling in three localities between 1996 and 2002 resulted in an estimation of 7.70 nests per km² (1,309,000 active nests per breeding season within the management area). The mean number of hatchlings per nest at the sites sampled ranged from 3.87 to 4.27 hatchlings (Banchs *et al.*, 2000).

The nestling collection quotas are based on the total number of participating properties, the amount of forest in each, and the degree of past compliance by each collector. For new properties, satellite photographs are used to determine the area of forest and estimate nest density. If the property is fully forested, there is a high probability that there will be at least one nest per 7 hectares. However, to be conservative, the project assumes one nest per 20 hectares. Therefore, on a 100-hectare property, nestlings may be collected from only 5 nests, regardless of the actual number of nests on the property. In each nest from which birds are collected, a minimum of one nestling must be left in the nest. Because the typical nest contains 4 eggs, of which 3 hatch, and 2 nestlings survive to fledge, on the 100-hectare property, two nestlings could be taken from each of the five nests. Thus, the quota for the property would be 10 nestlings. Using fledgling rate only, the harvest per nest is less than that recommended by Bucher *et al.* (1995) as sustainable. Using fledgling rate only, Bucher *et al.* (1995) recommended a harvest of 1.5 nestlings per nest based on a study of the population biology of the blue-fronted amazon at the Los Colorados Field Station, Salta Province. According to the model by Bucher *et al.*, on a 100-hectare property, 21.4 nestlings could be harvested sustainably given one nest per seven hectares.

The greater the number of properties that participate in the program, the higher the quota. Large properties are given much smaller quotas (based on an estimate of 1 nest/50 ha) because it is unlikely that the collector will explore the entire property. The total national quota is equal to the sum of the quotas from the different properties. The quota per property in succeeding years may be adjusted in response to the results of sampling (actual nest counts and number of hatchlings per nest). If a collector does not abide by the rules of the project, his quota may be lowered or, in rare instances, he may be expelled from the program. Only birds removed from individually numbered nest cavities in standing trees may be collected. Capture involves cutting a hole into the cavity to reach the nestling and resealing the hole following take. The project staff and landowners have

observed pairs re-using nests that have been opened in previous years, indicating that opening nests has minimal effect on the quality of a nest cavity.

The blue-fronted amazon in Argentina is viewed as a pest species by citrus growers (Bucher 1992). The species is legally classified as a pest species in provinces where the project permits the harvest of juveniles, and large numbers of blue-fronted amazon parrots were regularly shot by citrus-grove managers prior to the establishment of the sustainable-use program. During their visit, the Service biologists were informed that there has not been an observed decline in the number of juvenile birds at nearby roosting areas in spite of shooting that may occur on properties not participating in the program. The maximum take of juveniles is set at one-third of the number of nestlings collected in the immediately preceding breeding season. Although the number of participating properties may increase each year, the take of juveniles per unit area does not change. Juveniles can only be taken when the owners declare in writing to the local administrative authority that the birds are damaging their crops, and project staff must verify that the damage is due to blue-fronted amazons. Banchs and Moschione believe that there are over 700,000 juveniles in the transitional forest area (Pers. comm. with DSA and DMA biologists, Jan. 2003). Because few nestlings are found in the Salta and Jujuy Provinces, the creation of reserves there to protect the transitional forests, as required by Decision 425/97, was made possible only through the harvest of juveniles. Thus, the limited harvest of juveniles may actually increase the population by protecting important roosting areas. As with nestlings, a project staff member bands each bird captured and collects biological data. The staff member also explores the property to determine if the participant is also shooting parrots. If so, the quota is reduced in the current or following year, or the collector is suspended from the program.

It is doubtful that the individuals that are left in the nests following the nestling collection become the source of juveniles collected in the citrus groves are the same. According to Banchs and Moschione, this is because the distance between the nesting areas and the citrus groves is over 150 km. It is unlikely that the flocks observed in the citrus groves are those that nest on the properties participating in the program (E-mail to M. Kreger, February 7, 2003).

The total quota for nestlings and juveniles has not been met in any given