



Parrot pair inside a breeding cage. USFWS



# Iguaca Aviary

## Techniques used in the Puerto Rican Parrot Recovery Program

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### Captive Breeding

Captive breeding is critical to keeping the species from extinction. To maximize the genetic pool of the species, parrots in El Yunque and Río Abajo aviaries are managed as a single population, exchanging birds to form breeding

### Maximizing Egg Production

The parrots reproductive system is examined through endoscopy. This procedure allows us to identify sterile parrots and focus breeding efforts on parrots that are fit to reproduce.

Some parrots have high fertility and productivity. Biologists remove the first few eggs from those parrots to stimulate production of more eggs. Eggs with cracked shells can be repaired and saved by artificial incubation. In the aviary, incubators

The first captive flock of Puerto Rican Parrots was established in 1973 in the Luquillo Mountains by the U.S. Fish and Wildlife Service, to ensure survival of the species. The second captive group was established in 1993 in the José L. Vivaldi Memorial Aviary (Río Abajo Aviary), administered by the PR Department of Natural and Environmental Resources, located in the Río Abajo Commonwealth Forest.

The Luquillo Aviary gave support both to the field and enhanced captive parrot production. For 34 years, Service biologists have expanded our understanding of parrot biology and behavior, all aimed at releasing the most parrots to the wild with the highest survival.

From the Luquillo Aviary, the Service has been on the leading edge of parrot research worldwide. Our scientists have developed techniques that have aided conservation programs for other parrot species in Hawaii and throughout Latin America.

In 2007, the Service, in partnership with the U.S. Forest Service, completed construction of Iguaca Aviary. This new facility will serve as the Service's main facility to advance the parrot recovery. The following information describes the Service's efforts at the aviary in captive breeding and releases into the wild.

pairs. Mature breeding parrot pairs and young parrot pairs that have not yet reproduced are housed in the breeding cages during the reproductive season. Foster pairs may incubate eggs laid by other parrots.

### Fertility of the Eggs

Fertility is determined by "candling", or illuminating the air sac of the egg. Fertility can be determined from the fourth to the eighth day of incubation when a network of blood vessels begins to form within the shell.



Service biologist Iris Rodríguez examining eggs and looking for vein formation. USFWS



Service biologist Marisel López checking eggs inside the incubator. USFWS

are useful when a parent or a foster parent cannot incubate the egg. The most recently acquired incubator mimics a parrot mother. The machine does this by periodically changing the temperature and humidity, as it would happen when the mother parrot exits the nest and reenters throughout the day.

The Priscilla Stubbe Nursery will be used mainly during the breeding season to incubate eggs and care for young parrot chicks from the Iguaca Aviary, the Río Abajo Aviary, and at times from the wild population at El Yunque National Forest.

### Assisted Hatching

Typically after a female parrot lays the last egg in the clutch, she begins

to incubate the eggs for approximately 24-26 days until they hatch. The chick begins to break the eggshell from the air sac, and the entire process can take up to a day. When a chick demonstrates problems hatching, or is poorly positioned within the egg and cannot break free on its own, biologists can assist by carefully tapping on the shell on strategic locations. This work requires a great deal of patience and care to avoid damaging the vascular system of the egg that is providing oxygen to the chick inside.

### Chick Incubation

Chick incubators are used to house and feed young parrot chicks that occasionally are abandoned by adult parents. The incubators are maintained at a constant and specific temperature because the very young chicks cannot effectively regulate their body temperature. These incubators are also used to house parrot chicks brought in from the wild in need of veterinary care.

### Hand Feeding

This technique is used only when there are no foster mothers that can feed the chicks. A powdered formula is mixed with an electrolyte solution and delivered to the chicks with sterilized syringes. Hand feeding chicks inside the incubators requires constant care, feeding every two hours, 24 hours a day.

### Camera Surveillance

An infrared camera surveillance system allows biologists to see inside the wild nests to look for eggs and chicks without disturbing the parrots. Biologists are able to do this because parrots return year after year to the same nests. At the Luquillo aviary there was a surveillance system that has deteriorated. Iguaca Aviary offers a new, more effective monitoring system.



*Video monitoring aviary nests.  
USFWS*

### Veterinary Care: Annual Physical Exams

Every parrot gets an annual checkup; which includes blood work, weighing and physical examination of the wings to detect any parasites.

### Treatment of Illnesses and Emergency Situations

Both the adult and juvenile parrots that are suffering from mild to severe conditions are treated in the hospital. Veterinarian Dr. Antonio Rivera treats infections and wounds, applies treatments, and performs surgeries. An X-ray machine and a developer are used to diagnose parrots with possible bone fractures, or to determine if they have ingested a foreign object.



*Puerto Rican Parrot under anesthesia getting ready for a fertility study. USFWS*

### Blood Chemistry Test

The hospital has sophisticated equipment to analyze a blood sample and in minutes reveal information about the liver, pancreas, muscle enzymes, calcium, sodium, potassium and other important diagnostic parameters.

Birds have a very fast metabolism. If treatment is delayed, diseases can progress quickly resulting in mortality. Many parrots have been saved because of our ability to run blood chemistry tests on site to expedite diagnosis.

### Nest Material Sterilization

The immune systems of chicks are immature. This makes them susceptible to infections. Pulmonary infections caused by bacteria used to be one of the leading causes of mortality for young parrots. The Service has been able to virtually eradicate this problem by sterilizing woodchips used for nesting material in both wild and aviary nests.

### Quarantine

Parrots with potentially contagious diseases that could infect the rest of the birds are isolated in the Quarantine Room. Parrots that exit the aviary for public outreach and parrots brought from the wild and the Río Abajo Aviary are placed in quarantine for 30-40 days before joining the rest of the captive parrot population.

### Socialization and Exercise

Parrots socialize, form new pairs and exercise inside two 20 high flight cages. This is an important time for biologists to make observations and gather information about the parrots behavior that can be useful for breeding.

### Parrot Releases to the Wild

The goal of the recovery program is to have three self sustaining wild populations in Puerto Rico. So far, 66 parrots have been released in El Yunque and in Río Abajo Forest. The Service has created meticulous protocols tailored to the specific conditions of each one of the two release site. However, all parrots considered candidates for release go through training to help them develop flight skills, maneuverability, strength and stamina. To eliminate the possibility of introducing diseases to the wild, medical checkups are extensive. Released parrots are in top medical and physical condition. The release protocol includes predator aversion training, because predation is one of the leading causes of mortality for wild parrots. Biologists also install radio transmitters on the parrots' neck to track their whereabouts for up to a year after released.

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