



K. RENTON, UNAM/LPF/ The mountains skirted by clouds rise up from the coast.

Military Macaws on the Coast of Jalisco, Mexico

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The Military Macaw (*Ara militaris*) is nationally and internationally protected, and now occurs in discontinuous, localized populations throughout its geographical distribution. The main threat to Military Macaws is habitat loss, and it is estimated that this has caused a reduction of 30% in the original distribution of the species in Mexico. It is the macaw species with the most northerly distribution, occurring in Mexico along the Pacific slope from Sonora to Chiapas, and on the Atlantic slope from Tamaulipas to Queretaro.

Unfortunately, almost no information exists on the key habitats and food resources required to maintain macaw populations throughout the year. This lack of information can hinder its conservation, given that threatened species depend on the maintenance of all habitat types required to meet their needs. The conservation of Military Macaw populations could be stimulated by non-extractive use such as ecotourism, but the implementation of such strategies requires a sound social and scientific basis.

To gather the missing information, veteran parrot biologist Dr. Katherine Renton, of the National Autonomous University of Mexico, and the Loro Parque Fundación are collaborating in a project on the coast of Jalisco, Mexico. The project aims to evaluate the requirements of food resources, habitat and nest-sites of the Military Macaw, as well as understand the attitudes of local people towards macaw conservation, in order to provide a basis for implementing non-extractive, community-based conservation measures.

The project is being conducted along the coast in three vegetation

types: tropical dry deciduous and semi-deciduous forest, and temperate pine-oak forest. In each vegetation type, Katherine and her team have implemented point counts of the macaws and have established transects to examine plant life cycles (phenology) and have conducted field survey expeditions in the dry and rainy seasons. Point count surveys of the macaws have been conducted in the first 3-4 hours of the morning when psittacines are most active. In relation to the diet of Military Macaws, the team has made opportunistic observations in each vegetation type and period of the year. When feeding macaws have been encountered, the researchers have recorded the date, time, habitat type, geographic coordinates, tree species and size (dbh – diameter at breast height), as well as the number of macaws observed feeding, the plant part eaten (fruit pulp, seed, or flower), and stage of ripeness (unripe, ripe, or dry). For each forest type in each survey period the researchers calculated a fruiting index.

To date, Katherine and her team have found significant seasonal variation in macaw relative abundance, being highest in the dry season (average of 3.07 macaws per point count in February), with a decline over the rainy season (average of 1.67 per point count in September). This seasonal fluctuation in macaw abundance was associated with distinct vegetation types. During the dry season all individuals were recorded in tropical semi-deciduous and deciduous forests with no individuals recorded in temperate pine-oak forest. Macaw abundance was generally higher in semi-deciduous forest compared with the other two vegetation types over most of the year, with peak macaw abundance in this forest type in the middle of the dry season in April. In tropical deciduous forest macaw abundance was high in the early dry season month of February, but then steadily declined in this habitat type over the year. In the rainy season, macaw abundance declined in deciduous and semi-deciduous forest, but



K. RENTON, UNAM/LPF/ Field observations in Jalisco, Mexico (top left) and Palms within the semi-deciduous forest (top right). The Pine-Oak Forest (bottom left) and Military Macaws feeding on fruits of a Sandbox tree.

increased slightly in temperate pine-oak forest.

As regards food availability, the project team recorded a total of 454 trees, from over 52 species, producing fruit in the phenology transects. Both tropical deciduous and semi-deciduous forest demonstrated similar patterns of fruit availability throughout the year, although this was highest in the semi-deciduous forest. In both tropical forest types, peak fruiting occurred in the early dry season, declined steadily to reach lowest availability at the start of the rainy season and then increased again towards the end of the rainy season. By comparison, temperate pine-oak forest had lowest fruit availability and showed an increase in availability during the rainy season.

So far the project can demonstrate a strong correlation of higher macaw abundance with higher fruit availability in tropical deciduous

forest, with a similar positive correlation in pine-oak forest. This suggests that these forest types may be used only at particular times of the year for temporal food resources. No correlation of macaw abundance with fruit availability was found in tropical semi-deciduous forest. In this forest type, the relatively constant and generally higher abundance of macaws suggests that they use it not only for food resources, but may also use it for nesting and roosting.

The observations of foraging Military Macaws were mainly in semi-deciduous forest. The most frequent item consumed by the macaws was the unripe seeds of Sandbox trees (*Hura polyandra*) (81% of observations), followed by the seeds of ripe and unripe fruits of Breadnut trees (*Brosimum alicastrum*) (11% of observations), and fruit pulp of the palm nut (*Orbignya guacuyule*) (8% of observations). These were generally

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K. RENTON, UNAM/LPF/ **Military Macaws resting in a tree in Jalisco, Mexico (top left and right). Military Macaws in flight (bottom left). (Bottom right) A scientist measures a fruiting tree.**

large canopy trees, with an average dbh of 58.8 (range 27.6 - 126.9 cm), in which between one and seven (average 2.3) macaws were observed feeding in each tree.

The project has now initiated interviews with local people to assess local knowledge of Military Macaws, and attitudes to macaw conservation. This was not implemented at the commencement of the project as it was necessary to develop a working relationship and trust of local people so that responses to the questionnaire may be more reliable. During the field work and interactions with local people the project team has detected nest poaching activity, and expects to quantify this pressure through interviews with local people, as well as to evaluate the potential for macaw conservation.

Similarly, the identification of nesting resources for Military Macaws

has not yet been implemented, because it is also influenced by the need to develop a good working relationship of trust and support for the project objectives by local people, given that nest poaching has been detected in the region. Katherine and her team are currently working with local people to gain access to nesting areas and to raise awareness of macaw conservation.

The information obtained by the project will be directly applied in forestry management by local communities in macaw areas, identifying habitats and tree species for conservation. Recommendations from the study will also be incorporated in the Military Macaw Conservation Plan currently being developed in collaboration with Mexican government agencies.

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