CHAPTER 29

OUR ENDANGERED SPECIES AND CURRENT HABITAT CONSERVATION PLANNING EFFORTS

29. 1. LOSS OF SPECIES

As long as plants and animals have existed on earth, species have come and gone. Extinction of species were, until recently, mostly the result of natural events.

When the dinosaurs, for example, vanished 65 million years ago, human beings were not yet around to witness the event. The most likely cause of the extinction of the dinosaurs was an asteroid's collision with the earth, perhaps resulting in destruction of their plant food sources.

Nowadays, however, extinctions are generally the result of human activity, and they occur with much greater frequency than they did in centuries past.

The Marianas Mallard duck, or 'Nganga' (*Anas oustaleti*), is an example of a species native to the Marianas that is now extinct. It was last seen on Saipan in the late 1970's.

This species of mallard is thought to have come from a hybridization of two migratory duck species, the mallard and the gray. This hybrid *'species'* was our only duck to stay here year round.

The extinction of the Marianas Mallard is believed to have been caused by overhunting, the introduction of alien species, and the filling and polluting of our wetlands. It is important to note that this Mallard was **endemic** to our islands. In other words, it was not found anywhere else on earth.

29. 2. KEYSTONE SPECIES

Animal and plant communities, like human ones, are made up of species and individuals dependent on one another. In some ecosystems, removal of a **keystone species** can create a *domino effect*. This leads to the loss of other species that were dependent on it. Loss of one species can have disastrous consequences for an entire ecosystem.

Consider the case of a farmer who killed off all of the American crows (*Corvus brachyrynchos*) inhabiting his farm. He thought they were devouring his corn crop in the Midwestern United States. Unfortunately, once the crows were gone, his crop was entirely

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eaten by the European corn borer, a pest that had previously been preyed on by the very crows the farmer had destroyed.

29. 3. SOME CAUSES OF EXTINCTION

29. 3. 1. Habitat Loss

Plants and animals lose their homes for any number of reasons. Deforestation, acid rain (caused by air pollution), and land development are just a few of the pressures now faced by wildlife in the 21st Century. Worldwide, the number one cause of extinction is *loss of habitat.*

The brown treesnake (Boiga irregularis) is an example of an introduced species that has destroyed numerous wildlife species on Guam.

29. 3. 2. Introduction of Alien Species

As discussed in our last chapter, another significant threat to the native species on our islands is the introduction of **exotic**, non-native, or "alien" species to a habitat. The brown treesnake (*Boiga irregularis*) is an example of an introduced species that has destroyed numerous wildlife species on Guam.

Besides Guam, at the times of this book's writing, other Mariana Islands have so far been able to escape the harmful results of this snake's introduction. As mentioned, it was probably brought to Guam on US military cargo ships from the island of Manus.

Easily concealed in cargo, brown treesnakes were first observed on Guam in the 1960's. By the end of the decade they were found all over the island. While some individual snakes are preyed on by pigs, monitor lizards (*Varanus indicus*), and humans (yes, some people eat snakes) — their population remains very high: up to 12,000 per square mile of forest.

The Micronesian kingfisher is one of nine species rendered extinct on Guam due to the introduction of the brown treesnake.

All of Guam's native forest bird species have paid the price for the snake's presence. Nine species have vanished, while others, mostly migrants and introduced species survive, though in very low numbers.

Guam residents speak sadly of the lack of "bird song" on their island. They also experience first hand the power outages and agricultural losses for which the snake is responsible.

Thorough cargo and baggage checks at our airport and marine ports may help ensure that the brown treesnake does not become established on Rota, Tinian, or Saipan. Guam-based authorities are doing all they can to assist in this effort. (See our chapter on the brown treesnake.)

29. 4. ENDANGERED SPECIES LEGISLATION

29. 4. 1. Introduction

When an animal or plant species yields to pressures and its population decreases, it may be federally or locally designated as a candidate for listing as **threatened** or **endangered**. The next step is to place it on either the CNMI Endangered Species List, the federal Endangered Species List (which also applies to the CNMI), or both. Such listings empower certain regulatory authorities to intervene on the species behalf.

The federal Endangered Species Act (ESA) of 1973 deems endangered "any species facing extinction throughout all or most of its range". A threatened species is one likely to become endangered within the near future in all or most of its range.

The Department of Land and Natural Resources (DLNR) is our primary CNMI agency for enforcement of our endangered species laws. In October 1981, this Department's Division of Fish and Wildlife (DFW) was established by the Fish, Game, and Endangered Species Act, Public Law 2-51, mandating local endangered species protection.

The US Secretary of the Interior (land organisms) or the US Secretary of Commerce (sea organisms) may declare a species endangered or threatened after reviewing scientific and commercial information about the status of the species.

There are many species, including the Mariana fruit bat, or 'Fanihi' (*Pteropus mariannus mariannus*), that are candidates for listing on the US ESA in light of their populations' status in the CNMI. Our fruit bat is already listed as threatened/endangered by the CNMI. Another candidate for federal listing, the Mariana fragile tree snail (*Samoana fragilis*), is considered threatened/endangered by the CNMI.

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29. 4. 2. Protecting Habitats

When a species is determined threatened or endangered, the US Interior Secretary may designate a **critical habitat**. This is an area believed to have physical or biological features necessary for a species' survival. The protection of such a designated area is considered essential for the preservation of the species. Commonwealth law provides similar authority to the Director of the Fish and Wildlife Division of DLNR.

29. 4. 3. Law Enforcement

Unfortunately, laws alone do not protect species. The laws must be enforced and obeyed to be effective. Both the CNMI and the U.S. have agencies that are responsible for making sure our conservation laws are adhered to, and that appropriate penalties are imposed when they are broken.

29. 4. 4. Federal Actions and Policies

Within the U.S. Department of the Interior, the U.S. Fish and Wildlife Service administers the Endangered Species Act. This important law provides federal regulatory protection for listed threatened and endangered species.

Congress passed the Act in 1973 after finding that many species of wildlife (including fish and plants) had become extinct because of unchecked hunting and habitat-destroying economic development. Testimony before Congress showed that many other species were on their way to extinction. Congress enacted the ESA because our nation's wildlife have value.

Critical habitats, such as the Seabird Sanctuary on Rota, are believed to have physical or biological features necessary for a species' survival.

Development such as earthmoving that reduces an endangered species' critical habitat requires a federal permit.

Each case of development within our Mariana crow's, or 'Aga's' (Corvus kubaryi), critical habitat on Rota must be reviewed.

29. 4. 5. Objectives of the Endangered Species Act

The ESA has three objectives. First, it acts to assist in the conservation of endangered species habitat. Next, it carries out strategies for conserving threatened and endangered species. Finally, it takes steps necessary to achieve the goals of international treaties and conventions.

These treaties include several migratory bird treaties with Canada and Mexico and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). (See our chapter on federal and international laws.)

As indicated in Section 11 of the ESA, deliberate violation of any provision of the Act is punishable by a fine of up to $50,000 and a year in prison. (These figures may have increased since 1973.) A reward may also be paid to any person providing information leading to the arrest and conviction of someone who violates a provision of the US Endangered Species Act.

Among the key provisions of the ESA important to the CNMI, is one that prohibits the *taking* of an endangered species. **Take** is clearly and specifically defined. It means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect.

29. 4. 6. ESA Incidental Take Permits

Development such as earthmoving that reduces a US-listed endangered species' critical habitat requires a federal permit. For example, each case of development within our Mariana crow's, or 'Aga's' (*Corvus kubaryi*), critical habitat on Rota must be reviewed individually for federal ESA permit issuance.

This process is long and costly. A conservation plan for government entities may substitute for this review process, if it provides adequate "assurance" information.

29. 4. 7. Habitat Conservation Planning (HCP)

The plan or HCP, must detail the take's likely impact on the species. It must include how the impact will be minimized and how the minimization of the impact will be funded. The plan must also address what alternatives to the taking of the species have been considered and why they are not being used, and any other measures the US Interior Secretary deems relevant.

After reviewing the conservation plan and a permit application, the Secretary may issue an **Incidental Take Permit**. The US Interior Secretary will issue the permit if all the proper conditions are met. The permit will allow some decrease in the species, provided that the plan's implementation will assure the species would not become extinct during the plan's time frame.

29. 4. 8. Local Development's Success/Strategy

Can a development *work with nature*? Incorporating such a strategy for development on Rota yielded some very positive results for wildlife. On the grounds of the 222-acre Rota Resort, which includes a large 18-hole golf course, is a sewage treatment plant.

It was modeled after a Northern California treatment plant that, in

addition to treating sewage, is also an enhanced wetland, an aquaculture facility, and an interpreted migratory bird refuge. Locally designed and engineered by the EFC civil engineering firm, vegetation growing in the Rota Resort's treated water filters the development's sewage. This artificial wetland also supports Rota's birds.

In 1995, about three years after construction of the resort began, two Commonwealth and Federally-listed Mariana common moorhens or 'Pulattats' (*Gallinula chloropus guami*) were discovered in ponds planted with sedge (*Cyperus* sp.) at the treatment facility. Sightings of chicks confirmed it was a breeding pair. Moorhens were also seen at water hazards on the golf course.

This species, native to Guam, Tinian, Saipan, and Pagan, was **extirpated** (eliminated) from Pagan in recent years due to the volcano. Archeological evidence shows it only existed on Rota in prehistoric times.

The creation of wetlands at the Rota Resort has clearly provided new suitable habitat for an endangered species. However, there was a trade-off.

A large area of forest habitat of the also federally-listed Mariana Crow was destroyed due to its conversion to the golf course. At the time of this book's writing, biologists are actively monitoring the wildlife of Rota to better understand its wildlife population dynamics and the potential impacts of development.

If we can adequately understand human and wildlife ecology, can we make sure all of our developments *work with nature*? We hope so.

Mariana common moorhens, or 'Pulattats' (Gallinula chloropus guami), were discovered in ponds planted with sedge (Cyperus sp.) at the Rota Resort water treatment facility.

29. 5. ROTA'S NATURAL RESOURCE CONSERVATION PLAN

29. 5. 1. Introduction

At the time of this book's writing, a Natural Resource Conservation Plan (NRCP) is being developed for and by the Municipality of Rota in conjunction with the CNMI's Coastal Resources Management Program and, more recently, the Marianas Public Land Authority. Its main objective is to define and implement a multi-year strategy that conserves portions of Rota's forested natural resources on the CNMI's public lands.

Many of these lands are home to endangered species. Most are not considered prime lands for development. The plan is also being designed to support Rota's **ecotourism** and other development opportunities on Rota's private lands. With good planning, conservation does not have to mean loss of jobs or loss of economic development.

The NRCP will expedite the process of obtaining development permits. It will also allow traditional and sustainable harvesting of Rota's natural resources. These activities include collecting medicinal plants and permitted hunting. Finally, the NRCP will serve to preserve Rota's clean water and panoramic beauty.

This conservation area on Rota is being developed through the Natural Resource Conservation Plan (NRCP) and the Municipality of Rota in conjunction with the Coastal Resources Management Program.

It is understood that the NRCP's implementation would include funds for education development and for the training of personnel involved in monitoring natural resources and enforcing laws.

The introduced Sambar deer (Cervus unicolour) is implicated in habitat destruction which has negatively impacted several endangered species of plants and animals.

29. 5. 2. Threats to Species

Rota's NRCP is the first to be designed for a US-affiliated Pacific island jurisdiction. Because an island's natural resource base is smaller than that of a large land mass, protection of our plant and wildlife resources is especially critical for maintaining a viable number of each species. This can be done by carefully planning economic development. Careful planning is needed because, just as a small island's economy is sensitive to outside pressures, so too is its natural species' biodiversity.

As cited earlier, introduction of exotic species is one of the major threats to Rota's endangered species. The population of the endemic fire tree, 'Trongkon guafi' (*Serianthes nelsonii*), is believed to have been reduced by the grazing of the introduced Sambar deer (*Cervus unicolour*).

In part, because of the deer's browsing threat, this tree has been listed as endangered both federally and locally. Similarly, rats, another non-native species, prey both upon eggs and upon young birds. This may have played a role in the documented decline of the Mariana crow and the Bridled white-eye, or NOSA (*Zosterops conspicillata rotensis*).

The bridled white-eye, or Nosa (Zosterops conspicillata rotensis) is one species threatened by habitat destruction on Rota.

Other threats, found everywhere in the world, exist in the CNMI as well. Among the most serious dangers for several species is habitat change, caused largely by clearing of forest for agricultural and resort development.

One such threatened species is the Mariana Crow (*Corvus kubaryi*), found only on Rota (about 600 in 1998), and on Guam (where there were only 28 or so in 1998).

Currently about 50% of Rota is native forest, prime crow habitat. This figure may already be as much as 10% lower than what it was two decades ago, and it is expected to decrease further.

Protection of native forest is considered the best way to preserve the crow on Rota. Other species that have been, or would be, severely affected by development on Rota include the bridled white-eye, the Mariana fruit bat, some invertebrates, and several plant species.

Illegal hunting is still another threat to species, including the endangered Green sea turtle or 'Haggan' (*Chelonia mydas).* This species may be driven to extinction by people hunting for its meat, shell, and eggs. The Mariana fruit bat is also vulnerable because of hunting.

Before 1996, a large fruit bat colony existed on Mt. Taipingot on the southwest tip of Rota. As a result of an illegal hunting expedition in 1996, at the time of this book's writing, not a single fruit bat can be found at that roosting site. Rota residents vividly recall how the entire colony blackened the sky as it soared away from the shots of hunters that day.

What will happen to Rota if development were to proceed unregulated and all the species on the list, and others that may have to be listed in the future, became extinct?

It's difficult to imagine the silence that would replace our bird's beautiful songs if all Rota's, Tinian's or Saipan's birds were gone. As well described in Rachel Carson's book entitled *Silent Spring*, (no bird songs in Spring), and in Mark Jaffe's book entitled *And No Bird's Sing: A True Ecological Thriller Set In A Tropical Paradise*, this will be the likely state of our affairs if the brown treesnake is allowed to be introduced.

Tourism might actually decline because Rota's natural beauty, the main attraction for our visitors, would be lost. Loss of tourism would mean a general economic decline for Rota.

The destruction of Rota's forests and nearshore ocean plants (algae and phytoplankton) would even contribute to the overall decline of air quality worldwide. Green plants absorb carbon dioxide from our atmosphere and then release oxygen. A decrease in these plant's numbers would result in a slightly higher carbon dioxide content in our atmosphere.

The traditional use of medicinal plants, an important part of Rota's culture, could be lost.

Illegal hunting threatens the endangered green sea turtle or 'Haggan' (Chelonia mydas). This species may be driven to extinction by people hunting for its meat, shell, and eggs.

28. 5. 3. Development and the Natural Resource Conservation Area

The decline of Rota's natural resources would ultimately have negative effects on our wildlife and our people.

Currently developed areas include Songsong and Sinapalu villages, resorts, roads, and agricultural homesteads. There are two resorts, totaling 242 acres, on the island. (Leases for two proposed resorts require that important wildlife habitats be protected.)

Agricultural homestead programs have given our island of Rota's citizens large parcels of productive land ranging from one to five, to even twenty five hectares. The twenty five hectares number derives from quite a while back. The one hectare number is in use at the time of this book's writing. The rich Sabana area is farmed on a cooperative basis and land is not owned but rather leased from year to year.

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Because of less land available for crops, some government leaders have proposed to eventually reduce the size of homesteads to one acre. In the next couple of years, 35% of Rota will probably have been homesteaded or leased. The 1996 Rota Economic Master Plan proposed the development of an additional 40% of Rota: a total of 75% of the island.

In 1996, CNMI government officials began the process to carefully proportion the amount of public lands to be developed and that which is to be conserved. The NRCP would establish a Natural Resource Conservation Area (NRCA). It would also identify steps to minimize the impact to threatened and endangered species on public and private lands.

The Mariana Islands tree snail (Partula gibba)(left) and the Mariana Fragile tree snail (Samoana fragilis) (right) are both candidates for protection under the NRCA.

Tabernaemontana rotensis is one of the rarest plants in the CNMI.

These measures include:

- Grazing management
- Ecotourism/education
- Training for natural resources personnel
- Solid waste management, including recycling
- Physical protection for two plant species
- Continuing brown treesnake prevention

The NRCA would consist of existing conservation areas and add more acres of public lands. Its main function would be to lessen impacts that would accrue from proposals for public land use. Without the NRCA, new Rota golf courses and other planned developments might cause much damage to Rota's remaining endangered species and their habitats.

The NRCA would allow some road building and widening. It would monitor hunting in existing conservation areas where it is not already forbidden (Sabana and I Chenchon). It would permit some plant harvesting and recreation. An NRCA manager, the CRM permitting program, and a project review committee would administer the program.

The following species would be protected by the NRCP. This would be largely accomplished by preservation of their habitat:

the Mariana crow (*Corvus kubaryi*),
the Rota bridled white-eye (*Zosterops conspicillata*),
the Mariana fruit bat (*Pteropus mariannus*),
the Mariana fragile tree snail (*Samoana fragilis*),
the Mariana Islands tree snail (*Partula gibba*),
the Langford's tree snail (*Partula lanfordi*),
the Rota blue damselfly, (*Ischnura luta*), and
the Mariana wandering butterfly, (*Vagrans egestina*).

Seven plant species are also listed as candidates for the endangered or threatened lists, or are species of concern. It would even place fencing around individuals of the rarest plant species (*Tabernaemontana rotensis* and *Nesogenes rotensis*).

Rota's horticulturalists and forestry personnel are actively working to propagate Rota's endangered plant species.

29. 5. 4. Existing Conservation Areas

All four of Rota's existing conservation areas were established on October 13, 1994, by Rota Municipality local laws. The areas are managed and their laws enforced by the Department of Fish and Wildlife (DFW), and the Resident Director of Rota's DLNR.

Sabana Protected Area

This area allows *multiple uses*. These uses include farming, hunting, and conserving wildlife, as described in the Sabana Protected Area Management Plan (1996). It protects 3,636 acres at the summit of the Sabana.

I Chenchon Bird Sanctuary

The Sanctuary consists of 611 acres of Rota's easternmost coastline, set up primarily to protect nesting marine birds. It attracts numerous tourists to its public trail and scenic overlook. The *taking* of any *nongame* species (including the Mariana crow and fruit

bat) is prohibited. In addition, local surahanos may harvest medicinal plants found in the Bird Sanctuary.

Sasanhaya Fish Preserve
This area stretches along Rota's southwest coast from Gagani or Coral Gardens to Pona Point. It was set up primarily to conserve marine resources. Hunting and fishing are outlawed here.

Taipingot Conservation Area
The 292-acre Taipingot Conservation Area is located on Rota's southwest tip. It was established to protect the scenic 450-foot high Taipingot Mountain and its natural resources.

Rota's government leaders set up our first conservation area here in the 1960's. It is illegal to take any animal or plant species without a permit. Plants having medicinal properties, however, may be harvested.

29. 5. 5. The Devastation of the Rota Coral Gardens

Conservation laws cannot always protect our natural resources. In June 1996, the demolition of World War II military weapons in the Gagani or Coral Gardens section of the Sasanhaya Fish Preserve, killed an endangered green sea turtle (*Chelonia mydas*). It also obliterated much coral, on which numerous species were dependent.

An ecological study was later conducted by volunteers from the University of Guam Marine Laboratory, together with the CNMI's Marine Monitoring Team, to document the damage. It was extensive. A copy of the damage report is available by contacting the UOG Marine Lab on the Internet.

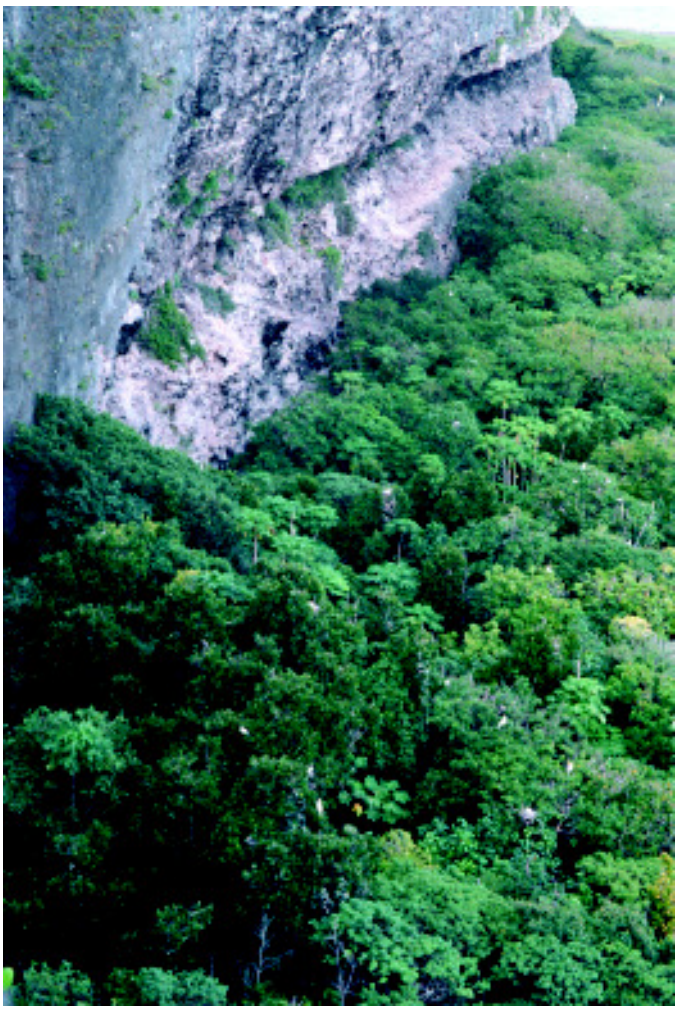
The study included a corollary reference to a similar US state preserve's economic damage assessment of a highly used coral reef which—if applied—estimated the economic damage to Rota exceeded $80,000,000 (80 million) US dollars.

Several top CNMI government officials felt the weapons were extremely dangerous to recreational users of the area. A state of emergency was declared to carry out the destruction of these weapons even though the welfare of marine life was clearly threatened.

This declaration circumvented our regular coastal resource management procedures. These include an expert evaluation of alternative actions; the hearing, consideration, and incorporation of public comments; and the mandated prior assessments of ecological and economic impacts.

In a somewhat happy/sad and most ironic twist of fate — the following April more ordnance was found. This time our government's officials (most in an acting capacity at the time, lead author included), recommended *against* declaring an emergency. They (we) recommended instead to let our CRM wise-decision making process function normally.

Using the CRM process, alternatives were considered and one very good one resulted. Somewhat incredibly, these new-found weapons (of the same type) were *moved* to very deep water just west of



The Chenchon Bird Sanctuary consists of 611 acres of Rota's easternmost coastline. This bird sanctuary was set up primarily to protect nesting marine birds.

the 'Coral Garden' site without any damage to surrounding marine life. This was done at a greatly reduced cost by the very courageous "Bombs Away" private ordnance disposal firm, based on Guam. No endangered species were hurt and the area's surrounding corals were protected. Good job Bombs Away.

29. 5. 6. Conclusion

These two incidents show how difficult decisions about conserving our natural resources can sometimes be. They can also teach us valuable lessons. An honest respect for our resources and an appreciation of their value are necessary to meet the challenges of conservation.

The NRCP is expected to balance this appreciation with our need for economic development. It would minimize the negative impacts on Rota's endangered species within the conservation area. As an underlying planning principle, areas where endangered and rare species populations are highest on an island should be protected. Commercial development actions should be targeted elsewhere.

The Rota Natural Resources Conservation Plan is expected to allow our island residents to preserve the resources and the beauty of this island. If finalized and adopted, we would be able to do this while continuing to pursue our economic and cultural development goals.

It will, however, require a joint effort in which all of Rota's residents must take part. It would not be effective if administered only by local and federal government authorities. Here is a unique opportunity for us to shape our own future — to hand our island's and nearshore water's resources down as a treasure, intact, to our children.

[Ed note: This chapter's author lived on Rota for two years as a volunteer with the US Fish and Wildlife Service. While she placed much of her focus upon Rota and its endangered species' protection efforts, each of our CNMI islands can benefit from her discussion and especially her final comment and goal.