

ENDANGERED SPECIES

Technical Bulletin Reprint

Wildland Management Center
The University of Michigan

From the World Wildlife Fund - U.S.



Sojourn of the Sea Turtle

by
Keith Pitchford

There may be no animal ritual as enigmatic and impressive as the arribada of the olive ridley sea turtle. Translated to mean "the coming", the arribada is a synchronized frenzy of egg laying performed en masse each year on tropical beaches. An arribada encompasses the most bewildering of animal instincts: the dateless migratory impulse of the females to travel hundreds, even thousands, of miles to lay their eggs on the same plot of land where they were hatched. How and why olive ridleys home in on their historic hatching grounds remains a mystery, as does the massive, synchronized appearance on the beach that often involves thousands of lumbering sea turtles. They emerge from the ocean and drag themselves onto the beach where, out of the water, they, and their eggs, are helpless against the seemingly insatiable appetites of predators.

Evolution has provided a unique balance between natural predators such as raccoons, crabs, lizards, birds, and other mammals that gorge on the millions of eggs laid, and buried, during the three- or four- day arribada. One sea turtle biologist termed the result of this event "one giant sandy omelette." Sea turtles have always managed to perpetuate themselves despite the fact that fewer than one percent of the young turtles make it back to their open ocean habitat. Their populations had done well, that is, until humans intervened.

Olive ridleys (*Lepidochelys olivacea*) are now one of seven sea

turtles listed as threatened or endangered by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and they are listed as threatened under the U.S. Endangered Species Act. The plight of the olive ridley is typical of all sea turtle species. Although olive ridley adults may number in the millions, they are considered endangered because of mismanagement in many places. Once utilized only by native peoples for their high protein meat, olive ridleys are now threatened by over exploitation for international trade. In fact, almost all products of wild sea turtles are utilized in international wildlife trade — their skins, meat, oil, and shells are worth millions.

The tendency of olive ridleys to congregate in large numbers near nesting beaches and in feeding areas makes them particularly vulnerable. Legal and illegal fisheries landed nearly three million ridleys in Mexico between 1965 and 1978, causing three of the major arribada populations to collapse. Exported turtle meat can net a tropical fisherman more money in several hours than he could earn in several months. Therefore, despite CITES and its membership of 87 countries including the United States, trade continues at high rates to non-party nations and also illegally to member countries. Four countries took exception to sea turtle trade regulations under CITES, so they have continued to



Researcher studies olive ridley sea turtle during nesting.

photo courtesy WWF-US

Sea Turtles

continued

commercially trade in wild sea turtle products. Japan is the only one of these that has taken exception on olive ridleys. In recent years, the European and Japanese leather market has promoted the slaughter of millions of olive ridleys in Mexico and Ecuador for use in shoes and other leather wares. There is also a heavy exploitation of eggs for local consumption in Latin America and Asia.

Olive ridleys are found in greatest abundance along the eastern rim of the Pacific Ocean. Major known arribada nesting beaches are limited, in this area, to the coasts of Oaxaca, Mexico and Guanacaste, Costa Rica. The populations in Mexico, once considered the largest in the world, were not protected and have been severely depleted. Fortunately, their nesting grounds are protected on two beaches in Costa Rica: one in Santa Rosa National Park and one in Ostional National Wildlife Refuge.



Olive ridley egg cache on the beach at Ellauti, Surinam.

photo by Peter Pritchard



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The World Wildlife Fund - US is sponsoring research at Playa Nancite, within the Santa Rosa National Park, to investigate an alarmingly low rate of hatching (<1%). This project investigates the possibility that decreased hatching success is due to bacteria and fungal contamination of the eggs. Similarly, WWF-US is funding Costa Rican biologists to assist the principal investigators on the beaches of Santa Rosa for one year in their study of olive ridley nesting and hatching activity. WWF-funded management activities previously limited to black turtles on the beaches of Michoacan, Mexico will now be expanded to include olive ridley and leatherback turtles.

The success of these projects will help alleviate damage to Costa Rican and Mexican turtle populations resulting from massive commercial harvest on non-nesting ridleys in Ecuador. Although the harvest in Ecuador was outlawed in 1981 and the government of Ecuador has taken strong measures to halt international trade of products, clandestine ac-

tivities continue in Colombia. Scientists surmise that this clandestine activity may have contributed since 1980 to a decrease in the numbers of nesting females at Playa Nancite in 1982 and 1983 by 42% and 85%, respectively.

Not all of this decline, however, can be attributed to commercial harvest in Mexico, Ecuador, and Colombia. The 1982-1983 "El Nino" phenomenon drastically disturbed the marine ecosystem along the Pacific coast of Central and South America. What effect this had on the ridley population is not known, but disruptions in food supply could have interrupted migration to Costa Rican nesting sites.

Egg poaching, a deeply engrained traditional use, has contributed to the population decline, however, this factor is seemingly less significant than the harvesting of olive ridleys for their meat and shells. As long as any trade continues in wild sea turtle products, organizations such as WWF-US must sponsor research and management programs to preserve these marvelous reptiles.

Plant Conservation: The First of Four Arguments for Conservation

As much as plants do for us, we have been doing very little to preserve plants. Over 25,000 plant species are now threatened with extinction. For this reason the World Wildlife (WWF) chose plants to be the subject of their fund-raising campaign for 1984-85. Working with their sister organization, the International Union for Conservation of Nature and Natural Resources (IUCN), they will attempt to increase the public's awareness of the importance of plants to people and of the need to support plant conservation programs.

About 80% of the plants programme funds raised during the campaign will be spent on field projects. The Reprint will feature WWF/IUCN arguments for plant conservation in the next four issues.

The arguments: 1. Crop plants

"Food, the most important human need, is quietly becoming the political hot potato of the century. Yet in the clamour over who owns what the critical issues of protecting wild plant relatives in the wild has up to now been neglected." (Paul Wachtel).

A few simple facts show the scope of the problem. People depend on plants for food, yet fewer than 20 crops supply more than 90% of the world's needs; three (wheat, rice and maize) provide more than half. These crops are being grown on a diminishing area of suitable land yet good agricultural

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New Trade Law Report Available From World Wildlife Fund-U.S.

Latin American Wildlife Trade Laws

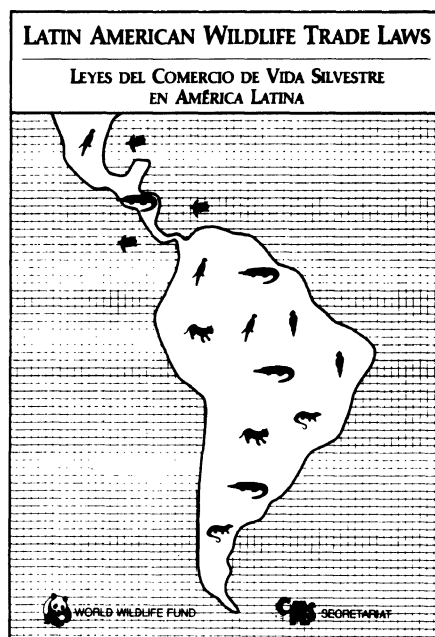
by

Kathryn S. Fuller and Byron Swift

This country by country analysis of the laws that govern wildlife trade in Central and South America provides current information about domestic wildlife restrictions in the entire region. A list of protected and regulated species is included for each country.

This report is a must for wildlife importers and exporters, government officials charged with monitoring wildlife imports into their countries, conservationists, and anyone concerned with trade in Latin American species.

Latin American Wildlife Trade Laws has received enthusiastic support from World Wildlife Fund-U.S., the CITES Secretariat, the IUCN's Environmental Law Centre, and the natural resources agencies of the Latin American countries. U.S. government agencies, such as the Department of Interior and State, have offered both finan-



cial and technical assistance. Other non-governmental groups, including the International Association of Fish and Wildlife Agencies, have also been generous supporters.

Plans are already underway to expand the report's scope to include other regions of the world, notably Asia, Africa, Oceania, and the Caribbean. Regular updates of the report will include new developments in Latin American wildlife trade laws and expanded coverage of plant trade laws and regulations.

The 354-page report has been published in both English and Spanish and is available for U.S. at \$11.50 each. Make your check payable to World Wildlife Fund-Trade Law and mail it to TRAFFIC (U.S.A.), 1601 Connecticut Avenue, N.W., Washington, D.C. 20009, U.S.A.

The arguments

continued

land covers only 11% of the earth's surface and is rapidly being lost through soil erosion and degradation and the spread of deserts. If the present rate of loss continues, 30% of the land will be lost over the next 20 years. But in this time the human population will increase by nearly half. Already an estimated 800 million people are destitute. How many more will be destitute 20 years from now?

This is the background to the concern about the loss of those heritable characteristics of actual or potential use to man, termed genetic resources. It is most serious in two groups of plants under threat: 1) Primitive cultivars and land races, and 2) wild relatives of crop plants. Their loss is making the 20 major crops of the world look increasingly vulnerable.

According to the International Board for Plant Genetic Resources, the new high-yielding varieties, very uniform, are rapidly changing traditional and peasant farm lands. The new varieties provide greater yields and have other beneficial characteristics, but are replacing the old traditional cultivars and so may be responsible for eliminating about 10,000 years of evolutionary development, on which future breeding and security will rely. For example, in the last 40 years, 95% of all the native varieties of wheat in Greece have been lost forever. According to the Board, "future generations are thus deprived of variation which is the raw material for breeding programmes and in particular for providing genetic combinations which can be used to combat actual or potential ravages by pests and diseases".

Indeed, the uniformity of the new advanced cultivars make them especially vulnerable to epidemics of pests and diseases. For example in 1970 the U.S.A. maize crop was devastated by a case of Southern Leaf Blight, because 80% of the plants were susceptible to the disease. The new cultivars are few in number and very widely planted: more than half Canada's prairie wheatland is planted with a single variety, increasing the risks.

It is well known that plant breeders have to fight a constant battle to keep one step ahead of pests and diseases, because races of insects, fungi and bacteria rapidly develop resistance to pesticides in uniform crop species. For example every barley variety marketed in Britain in the last 20 years has lost its resistance to mildew within three years.

The value of the disappearing land races is well proven. They are genetically diverse and have evolved slowly, usually under conditions of low intensity cultivation. Selection pressures have been environmental, such as for hardiness, rather than for high yield. They can therefore offer resistance

to extremes of climate and geography, as well as resistance to pests and diseases. Recent exploration in the Himalayan foothills of N.E. India has yielded many primitive rice cultivars resistant to major diseases and pests, including bacterial blight, tungro virus, gall midge and stem borer.

The other group of vital plants coming under threat are the wild relatives of crop plants — species such as *Zea perennis* and *Z. diploperennis*, *Olea laperrinei* and *Punica pro-toponica*. Unlike the land races, they are threatened not so much by the new varieties, but by loss of the wild habitats in which they grow. Preserving their seeds in deep-frozen gene banks is less than satisfactory, because of the vulnerability of the collections, because seeds of many crops such as coconut, oil palm, banana and coffee cannot be stored in this way, and, most serious, because seeds stored are as if plucked at one stage in their evolution. In the wild, plants are constantly evolving to meet the attacks of new predatory insects, climatic changes and varying soil conditions.

There are many examples of how wild relatives have contributed to better and more resistant crops: wheat obtains much of its rust-resistance from genes found in wild relatives in the Mediterranean, Middle East and Asia Minor. In the 1960s, the U.S. wheat crop was saved from an epidemic of stripe rust by genes from wild wheat in Turkey. Wild resistance in tomatoes is supplied by genes from wild South American relatives which have been bred into modern cultivars. And a single population of *Oryza nivara* rice from central India is the only known source of resistance to Grassy Stunt Virus, which was once a serious disease. Resistance from this rare plant was bred into a cultivar IR36, which has since become the most widely grown variety of rice. Perhaps the most startling case of all, dubbed the botanical find of the century, is the diploid perennial maize *Zea diploperennis*, whose benefits have yet to be realized.

Genetic diversity is centred in areas where particular crops originated. There are nine major and three minor areas, termed Vavilov Centres after the Russian scientist who first identified them. As the map shows, most are in developing countries. Some are in places such as Ethiopia that are devastated by waste and famine. Most are in areas where loss of vegetation is most severe. Indeed, the need to conserve crop relatives is one of the most potent arguments for protection of natural habitats. Once lost, this variation can never be replaced.

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