

# I NTERNATIONAL C ONSERVATION

## NEWSLETTER

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### Experts Urged Proper Management of Bluefin Tuna Fishery

As the craze for bluefin tuna (*Thunnus thynnus*) consumption continues throughout Taiwan, experts urged the government to take appropriate measures for the management of bluefin tuna fishery. Stocks of the species and their catch-weights are dropping sharply, and fishermen now predominantly catch large, sexually mature specimens that have not yet reproduced. Fishery activity of this kind does not meet requirements for the sustainable utilization of bluefin tuna resources.

Consumer interest in the fish has been drummed up by annual 'Bluefin Tuna Festival' held by Pingtung County in South Taiwan over the past four years. As consumer demand has risen, prices have been pushed sky-high. Now, as soon as the bluefin season arrives, local fishermen vie with each other to cash in on the tuna harvest. Conservationists worried that the Bluefin Tuna Festivals could one day spell the end of the species.

According to statistics from the Council of Agriculture (COA) Fisheries Research Institute (FRI), in 1990, the annual production volume of Pacific bluefin tuna from Taiwan was less than 200 tons. At that time, the main catchers of Pacific tuna were Japanese and American fishing fleets. In those early days, Taiwan's fishermen were not particularly interested in catching bluefins. This changed suddenly as bluefin tuna exports were sold back to Taiwan. This, and the fact that various parts of Taiwan started holding Bluefin Tuna Festival to promote sales, have meant that bluefin tuna is now a hot commodity at fish markets all over the island. Prices too have rocketed. In recent years, the amount of bluefin tuna caught by Taiwan-based fleets has rapidly exceeded that of the United States, placing it second to Japan as the world's second largest producer of bluefin tuna. In 1999, annual bluefin tuna production rose to a record high point of more than 3,000 tons. Over the past few years, however this has tended to fall gradually, with the production figure for 2002 being less than 2,000 tons.

However, Mr. Chi-lun Wu, Associate Research Fellow at the FRI, said that the

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phenomenon described above could not be taken as evidence that bluefin tuna resources are being overused. He said that the demise in bluefin tuna stocks was mainly due to the El Nino Effect, which was causing ocean temperatures to change and making existing fishing areas unsuitable for habitation by the species. He said that this was causing bluefin tuna to change their migratory patterns and the depths at which they live.

National Museum of Marine Biology and Aquarium (NMMBA) president Dr. Lee-Shing Fang, however, disagreed with Wu's opinion. He said that the fact that both the catch-rate and the catch-weight of bluefin tuna caught by Taiwanese fishermen were showing a sharp decline should be taken as a warning. He called on the government to institute long-term planning for the management of bluefin fishery. Even taking climactic or environmental factors into account, he said that it was clear that the

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threat of over-fishing was ever present. Dr. Fang said that it was near impossible to fully assess the threat to the species based on the catch data of one single nation or area. Due to the bluefin's migratory nature, America, Japan, the Philippines, Australia and other nations catch the tuna at different stages in their physical development. He pointed out that, while the exact migratory path taken by the species remains a mystery, one thing is sure and that is Taiwan's impact on the species' survival cannot be underestimated. Particularly, since the bluefin tuna migrating through the waters around Taiwan have reached the stage where they are physically mature but have yet to reproduce.

Mr. Wu of the FRI agreed with this. He said that the Pacific bluefin tuna migrating past Taiwan's East Coast were mostly egg-bearing females. If these females on their way to spawn and reproduce were caught indiscriminately and without restriction by humans there would be no next generation for the species and the day would indeed come when Taiwan's bluefin tuna resources would dry up.

The deputy director of the COA Fisheries Agency's Deep Sea Fisheries Division Yu-Chen Chen said that the conservation and sustainable utilization of bluefin tuna resources is already an international trend. She said that Taiwan must seek cooperation with other nations to strengthen the monitoring of bluefin resources and ensure the sustainability of bluefin tuna fishery. Dr. Fang of NMMBA said that Atlantic nations had already reached a

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consensus on limiting the number of Atlantic tuna caught. But, Pacific nations were still working in a disunited way against each other for individual benefit and that this is where the real threat to the bluefin tuna's continued survival lies.



## Management of Invasive Species

In order to stem problems arising from the invasion of exotic species into Taiwan concomitant with the island's entry into the World Trade Organization (WTO), the COA established "the Committee for Strengthening Exotic Species' Management and Prevention Consultation" within its Bureau of Animal and Plant Health Inspection and Quarantine (BAPHIQ).

The mission of the Committee is to help avert a clash between Taiwan's economic and environmental interests as the island attempts to globalize and liberalize trade as part of the WTO. The Committee will pro-actively unite relevant authorities in establishing bio-management mechanisms to control the impact of invasive, while also drawing up and promoting concrete management measures. The Committee will hold conferences to discuss and analyze the various management systems currently used in Taiwan and abroad, and call on the general public to heed the real and potential threats posed by the introduction of non-native species.

Invasive species can cause serious disruption to the environment by destroying the complex and subtle balance of ecosystems. For

instance, in recent years, Taiwan has suffered extensive agro-economic and environmental damage due to the invasion of exotic pests like the land snail (*Ampullarium insularum*) of South America, the pinewood nematode (*Bursaphelenchus xylophilus*), mile-a-minute weed (*Mikania micrantha* H. B. K.) and others.

The extent of areas damaged by the red fire ant (*Solenopsis invicta*), which is listed on the COA's ROC Regulations for the Inspection and Quarantine of Imported Plant and Plant Products, already include several Townships in Taipei, Taoyuan, and Jiayi Counties. Areas affected include a range of agricultural and municipal areas, for instance paddy fields, nursery gardens, bamboo groves, parks, schools, and railway track. It is estimated that a total of 498 km<sup>2</sup> of land has been affected.

The pinewood nematode, which causes the wilting and death of healthy pine trees, spread rapidly during the period 1991 to 1997. Outbreaks continue to be reported in northern, central and eastern Taiwan, mostly in pines growing in lowland schools and parks.

The COA said that since Taiwan entered the WTO in January 2002, the transportation of agricultural and other animal and plant products into Taiwan has become more frequent. Furthermore, as the number of local people traveling abroad for pleasure increases, the opportunity for foreign epidemics, pests and other exotic species to invade Taiwan through various channels has risen. Therefore, the work of managing exotic species cannot be underestimated. The COA will work with relevant agencies to promote various

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management mechanisms, while strengthening the dissemination of information about invasive species to increase public awareness of their threat to Taiwan's economy and its environment. The COA called on the public to join the government in helping to stamp out the problem of invasive species.



## **2004 National Conference for Non-Governmental Organizations**

On Earth Day this year, the Taiwan Environmental Protection Union (TEPU) held the 2004 National Conference for Non-Governmental Organizations (NGO) in Taipei, attended by a total of 55 NGOs represented by more than 130 representatives. The agenda included five major topics: 'green' energy and a non-nuclear homeland, nature conservation and land preservation, green industries and green consumerism, local planning and public participation in policy-making processes, and policy monitoring and strategic alliances.

In a speech to delegates, ROC President Shui-bian Chen said that thanks to the Legislature for passing the Basic Environmental Law in 2002, Taiwan became the first country in Asia to push for a nuclear-free environment. The president vowed that Taiwan would enter the international community through its NGOs, which are working hard for environmental protection. He said he was planning to convene conferences on national energy policies and sustainable development. Through the full participation of

citizens at all levels, Taiwan's transformation into a nuclear-free nation could be accelerated.

Conference chairman Professor Hsien-yu Cheng explained the three key tenets of the TEPU and put forward the basic principles for establishing a common advocate and vision for Taiwan, based on the charter of the Global Greens (Canberra 2001), including the six main areas of ecological wisdom, social justice, participatory democracy, non-violence, sustainability, respect for diversity, and the precautionary principle.

The main conclusions on the discussion of the five major topics were as follows. The main conclusion on the first topic, Green Energy and a Non-nuclear Homeland, was that, based on the clause of the Basic Environmental Law that calls for a nuclear-free nation, the government should immediately stop building the already half-completed Fourth Nuclear Power Plant, while pushing for the early decommissioning of the island's three existing nuclear power plants. Furthermore, total domestic energy reduction should reach 10% or more by the year 2008 and that the proportion of energy from renewable sources in total energy production should have exceeded 10% by the year 2010.

The main conclusions of the second topic, Nature Conservation and Land Preservation, were that environmental rights should be made a part of the ROC Constitution, a legal foundation for relevant taxation mechanisms and education should be established, and a concrete opinion on the preservation of the ocean, coastline, rivers, forests and slopeland,

and the conservation of species should be formed.

The main conclusions of the third topic, Green Industries and Green Consumerism, were that the call for 'zero garbage' in the industrial and public arena should be achieved, by requiring that reuse of recycled resources should exceed 50% by the year 2008. Participants also agreed that much government policy, including the 'Five Year Five-hundred Billion' project being promoted by the Executive Yuan, must be seriously reviewed and revised. The contents of the project should be reviewed by the cabinet-level National Council for Sustainable Development (NCSD) and include input from relevant NGOs.

The fourth topic, Local Planning and Public Participation in Policy-making Processes, requires that the government review the status of environmental protection of coastlines, rivers and local communities within the next six months. Furthermore, the government should put forward a report on how it planned to improve dialogue with NGOs over the next four years. Representatives called on Taiwan's leaders to abandon various major water projects, which were flawed, and formulate an alternative to the currently planned Suao-Hualian Highway.

Finally, while discussing the fifth topic, Policy Monitoring and Strategic Alliances, delegates promised to play their part in Taiwan and international environmental movements to start with local issues, then link NGOs on a national scale, and finally make international contact with like-minded groups abroad.



## Follow-up on Environmental Impacts of Maritime Oil Spill

More than three years after a Greek bulk cargo ship ran aground on reefs off Hengchun in south Taiwan, spilling more than 1,000 tons of fuel oil and polluting over three kilometers of coastline, the wreck and its cargo of mineral ore continue to damage the pristine marine ecology around Kenting due to a lack of salvage finance.

According to the Kenting National Park Administration, the wreck continues to pollute water off Kenting and the Lungkeng Wildlife Reserve. A team of experts will be sent to dive around the wreck to explore the surrounding ocean bed for further damage. Already, parts of the coral reef at Lungkeng at a depth of around 15 meters were broken off when the wreck of the M.V. Amorgos sank to the ocean floor.

Early on, the wreck broke into 17 large fragments, which lie scattered in six major sections. However, innumerable pieces of iron plating of varying sizes continue to be moved in all directions by the waves. These loose sections act like knives, continuously carving sections of live coral and damaging coral inhabiting organisms from the reef. In addition, as much as 80,000 tons of iron ore and other materials were spread across the ocean floor, where it is still subject to sea erosion and continues to pollute the ocean environment.

The Amorgos ran aground on submerged reefs on Jan. 14, 2001 approximately one kilometer east of Oluanpi, causing some 1,150 tons of fuel oil to leak out and contaminate the

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coastline that constitutes part of Kenting National Park. The wreck eventually sunk after splitting in half. The NT\$300-million-lawsuit against the ship owner brought by Taiwan's Environmental Protection Agency remains unresolved even today and so far Taiwan has only received a little over NT\$9 million in fines and NT\$60 million in costs for cleaning up the oil. In the absence of any money for salvage operations, officials say that all that can be done is to wait for the marine environment to gradually cause the wreck to disintegrate. However, as parts of the broken hulk have been dragged towards the shore, this could pose a serious risk to other vessels navigating the area, especially if the trail of wreckage continues to extend closer to the shore.



## **EPA Designated Five Marine Waste-Disposal Sites**

On May 4, 2004, Taiwan's Environmental Protection Administration (EPA) formally designated five marine areas as underwater waste-disposal sites. In accordance with the Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matter (also known as the London Convention), the disposal of toxic substances at sea is outlawed. So far, the Ministry of Transportation and Communications' Kaohsiung Harbor Bureau is one of two organizations that have been permitted to use the dumps. It will dump dredging slurry. The other will dispose byproducts from the manufacture of the flavor enhancer, monosodium glutamate.

Surrounded by ocean on all sides, Taiwan has long held the practice of dumping waste at sea in the absence of concrete environmental protection measures. In November last year, in line with Article 20, Clause 2 of the ROC Ocean Pollution Control Act (OPCA) promulgated in 2000, the EPA proposed regulations for dumping and incineration at sea. This was followed by the recent announcement of the underwater waste-disposal sites and the criteria for classifying which types of waste are suitable for disposal at sea.

The five sites designated by the EPA for underwater waste disposal are 20 to 40 kilometers from the east and west coasts of Taiwan to the northwest, southwest, west, northeast, and southeast of the island. The exact longitude and latitude of the sites has been clearly marked in order to facilitate marine dumping without affecting local fishing operations. Based on the climactic conditions and commercial fishing seasons of each of the five locations, the EPA's announcement includes information on limitations of the type of waste to be disposed of at each site and the times of year that dumping there will be permitted, to stem the spread of the pollution.

The largest of the designated sites lies 20 km off the coastline at more than a kilometer deep. It covers an area of around 2,800 km<sup>2</sup>. No special limitations have been placed on the type of waste that can be disposed of at this site, provided it meets EPA criteria and the period of the northeast monsoon is avoided.

The EPA has identified three categories of waste, only some of which can be dumped at

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sea. Class A waste, which is prohibited from sea disposal, refers to those hazardous industrial byproducts that contain mercury, cadmium, waste oil, waste plastic and a spectrum of poisonous chlorinated hydrocarbons, which do not easily dilute or biodegrade and remain harmful to the environment and the food chain for generations. Class B waste is made up of heavy metals and their compounds, such as lead, nickel, copper, arsenic, zinc, Dimethicone and chromium. They must be certified by a test procedure each time a disposal application is made before the EPA allows them to be dumped at sea in limited amounts. Class B waste must meet EPA criteria for disposal and may not include mud contaminated with Class A materials, pesticide and its derivatives. All non-toxic refuse that is not classified as Class A or Class B is designated as Class C waste, the dumping of which can proceed according to time and volume restrictions after a legal application has been filed.

Although its announcement has met with some criticism from NGOs and private organizations, the EPA said that marine dumping has been going on unregulated in Taiwan for many years, and the designated areas and identification of three classes of waste constitute a clear attempt to control this activity. Furthermore, the announcement is in accordance with the London Convention and requires that applicants gradually decrease the amount of waste disposed each year, thus reducing the feasibility of pollution.



## Introduction to Taiwan's Nature Reserves Tawu Taiwan Amento Nature Reserve

The Taiwan *Amentotaxus* (*Amentotaxus formosanae*), also known as the catkin yew, is a

coniferous tree endemic to Taiwan. The male and female cones of the species are different. In the male cones, the inflorescence hangs down vertically like ears of grain, giving the species part of its Chinese name 'sui' or grain. The trees grow to a height of up to 10 meters, while the diameter of the trunk is usually around 30 cm. The species' distribution within Taiwan is limited, with specimens being found at elevations of between 1,100 to 1,500 meters above sea level. The tree prefers warm, damp low mountain slopes and valleys, and grows in small groups. The Taiwan *Amentotaxus* is listed as a rare and valuable plant species under the Cultural Heritage Preservation Law.

In 1973, The Taiwan Forestry Bureau's Taitung Forest District Office discovered populations of this rare species during a survey of the 39th forest compartment at Tawu. In June 1986, the COA formally designated the Tawu Taiwan *Amentotaxus* Nature Reserve to protect the species and its environment.

Located in Tajen Township in Taitung County, the Reserve covers a range of elevations between 900 and 1,500 meters above sea level in the northern Tawu Mountains, which straddle the border of Taitung and Pingtung counties. The area's topography is composed of sandstone and shale dating back to the middle Miocene period. The average annual temperature is 16 °C and mean annual precipitation is between 2,500 mm and 3,000 mm. The Reserve belongs to the sub-tropical broadleaf forest type and has a wide variety of plant species growing within it, with ground cover plants being particularly abundant.

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The distribution of plant cover in the Reserve changes with elevation, starting with the red nanmu (*Machilus thunbergii*), *Castanopsis carlesii*, and wheel trees (*Trochodendron aralioides*), then progressing to forest species like the yellow basket-willow (*Engelhardtia roxburghiana*), *Beilschmiedia erythrophloia*, *Persea konishii* and other similar plant groups, and on to the Taiwan alder (*Alnus formosana*), *Alniphyllum pterospermum*, and *Machilus japonica*. The Taiwan Amentotaxus is the only type of pine tree found in the Reserve. It forms the second layer of the tree canopy in the third group of trees mentioned above. Analysis of the make-up of Taiwan Amentotaxus populations by measuring trunk diameters shows that the species' rate of renewal is good. In addition to the Taiwan Amentotaxus, the Reserve is also home to several other rare plants, i.e. *Kudoacanthus albo-nervos*, *Cyathea loheri* and *Calymmodon cucullatus*. Studies indicate that the Taiwan Amentotaxus has been growing in Taiwan since the last ice age. The trees flower in March or April and produce a sweet, dark purple fruit in July and August that is a favorite of animals.

Apart from a small number of mountain tracks, the Reserve is mostly covered in a lush, green carpet of vegetation, mainly grasses and shrubs. This and a thick layer of fallen leaves and branches, and the odd withered tree stump create an excellent habitat for a wide number of wild animals. At least 60 bird species, 19 mammal species, four amphibians, 12 reptiles, and 29 butterfly species have been recorded within the Reserve. Of these, rare or

endangered species like the Hodgson's hawk eagle (*Spizaetus nipalensis*), the Formosan yellow-throated marten (*Martes flavigula*), the small Chinese civet (*Viverricula indica*) and the hundred pacer snake (*Agkistrodon acutus*), among others, have been spotted.

At present, a census of each individual Taiwan Amentotaxus tree within the Reserve has been completed. Each stand has been numbered and tagged to facilitate subsequent follow-up research and protection.



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