



The new Executive Secretary to the CBD, Ahmed Djoghlaif, presents Brazil's Minister of Environment and COP 8 President, Marina Silva, with a token of appreciation at the closing ceremony of COP 8.

## GEARING UP FOR COP 9

The next Conference of the Parties (COP 9) to the Convention on Biological Diversity (CBD) will take place in 2008 in Germany. This will include an in-depth review of ongoing work on the implementation of relevant decisions on invasive alien species, based on *inter alia* an analysis of the Third National Reports submitted by Parties to the CBD, and views and experiences submitted by Parties, other Governments and relevant international organizations.

This review offers the biodiversity community – and especially those with a specific interest in invasive species – a wonderful opportunity to really take stock of where we are in terms of addressing this threat. And given the ever-increasing number and severity of invasions – predicted to be exacerbated even further by climate change – it seems an opportunity not to be missed. Moreover, given the timing, this review should be seen as a step in the process of assessing whether we will meet the 2010 Biodiversity Target – and the relevant sub-targets.

So, what needs to be done in preparation for this review? The questions on invasive alien species in the Third National Report template are reasonably straight forward, addressing

issues such as whether countries monitor the introduction of alien species, undertake risk assessments, have established prevention systems and engage in international cooperation. They further look at the extent to which countries are implementing the Guiding Principles as presented to COP 6. However, according to the information available on the CBD website, less than half of the 188 Parties have submitted their Third National Reports to date, although the deadline for submission was May 2005. Clearly, this is insufficient to provide an accurate picture of implementation at the national level. We would therefore encourage those Parties that have not yet done so, to submit their reports as soon as possible.

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## FROM THE DESK OF THE DIRECTOR

During the course of the past year, GISP – in collaboration with the CBD and in response to COP Decision VI/23 para. 26(e) – has initiated the development of a Joint Global Work Programme on invasive species among the relevant international organizations.

One of the first steps in this process was to hold two workshops attended by representatives of many of these organizations (international and regional), as well as specialists from national governments. The first of these, with support from the UNEP Regional Seas Programme, focused on invasives in marine ecosystems, while the second dealt with terrestrial and freshwater species. Both reviewed the current state of play with respect to legal and institutional matters, availability of suitable technologies to manage invasive species, capacity and research needs, information sharing and awareness. They then identified gaps and proposed a set of actions to address these. While the outcomes of the two workshops are currently being merged into one, the Action Plan for the marine environment was submitted to SBSTTA 11, and is available as UNEP/CBD/SBSTTA/11/INF/10.

Given the transboundary and cross-sectoral nature of invasive species, I believe that this initiative has, potentially,

huge significance. However, for this potential to be realized, the Action Plan must garner the necessary support.

In the first instance, a number of core organizations were unable to attend the workshops. In the flurry of meetings that now populate the global diary of events, this is no doubt understandable. But it is imperative, if we are going to be effective in our campaign against invasives species, that we all pull together, and in the same direction. I would therefore like to call on these organizations to engage with GISP to see how they can contribute to those activities within their remit.

The second point is that, as has been the case in many CBD decisions on invasive species, the workshops assigned a large portion of the work to GISP and its partners. And while we are more than willing to try and meet this challenge, even coordinating the implementation of the Action Plan requires resources. We trust that in the face of the ever-growing body of evidence on the massive impacts of invasive species, the level of political will and commitment to addressing them will be sufficient to enable us to raise the required resources.

**Dr Lynn Jackson**  
*Director: GISP Secretariat*

## Brazil to support the GISP Ten Nations Initiative



Bráulio Dias, Coordinator of Biodiversity Conservation for Brazil's Ministry of Environment, announcing his country's support for GISP at a COP 8 side event.

During the COP 8 meeting in Curitiba, Brazil made a formal announcement of its commitment to support the Ten Nations Initiative, a GISP strategy to secure funding to enable it to escalate the implementation of the GISP Global Strategy. This support will take the form of an annual contribution towards the GISP Secretariat, as well as increased spending on invasive species management within Brazil.

Although GISP has had considerable success since its establishment in 1997, the invasive species problem continues to grow at an ever-increasing pace as globalization gives rise to ever higher levels of trade, transport and travel. GISP's pivotal role in promoting international collaboration around invasive species prevention and management is therefore more crucial now than it has ever been before.

The announcement at COP made Brazil the first country to join the Ten Nations Initiative. South Africa has also subsequently made a contribution, while a number of other countries have expressed interest. GISP would like to congratulate Brazil on their foresight, and encourage others to follow their lead.

Of course, provisions requiring countries to address invasive alien species are not limited to the CBD, but are also found in a number of other Multilateral Environmental Agreements. Countries are therefore also encouraged, in contributing information to the in-depth review, to take into account relevant activities under these other agreements. A potentially useful tool in assisting this process is the set of issue-based modules recently developed by the UNEP World Conservation Monitoring Programme (UNEP-WCMC), which provides a clear summary of country obligations under the CBD and other conventions, including Ramsar, the Convention on Migratory Species, CITES, the Ballast Water Convention, the International Plant Protection Convention, and the SPS Agreement (on the application of Sanitary and Phytosanitary Measures).

The module on Invasive Alien Species is divided into seven sections, each dealing with a different category of obligations:

- Assessments, including risk assessment, impact assessment, presence of IAS, identification, reporting and indicators
- Legislative measures and national policies, including national strategies
- Management, including the prevention and eradication of IAS, rehabilitation and restoration, and other non-legislative approaches
- Economic instruments, including incentives
- Provision of resources, including funding activities and capacity building
- Communication, education and public awareness, including training
- Cooperation, including coordination across sectors.

This tool shows how obligations under one convention often complement activities under another. For example, the need to assess the presence and threats of invasive species in Ramsar sites will go part of the way to fulfilling the CBD requirement to assess the impact of invasive species on biodiversity more generally. Reports prepared for one convention can therefore be used, at least in part, in the reporting to another convention, allowing for more streamlined and efficient delivery on reporting obligations. The modules can be found at: [www.svs-uneipbmdb.net/](http://www.svs-uneipbmdb.net/).

There are a number of other activities linked to the CBD work programme that could generate a substantial amount of information, and

provide very useful points of reference for the review process. These include:

- Follow-up to the work of the Ad Hoc Technical Expert Group on Identification of Gaps and Inconsistencies in the IAS International Regulatory Framework – which identified a number of pathways for which there are at present inadequate controls. (Noting that a sub-target of the 2010 Biodiversity Target is: “to have pathways for major potential alien invasive species controlled.”)
- The development and implementation of a Joint Global Work Programme on Invasive Species which, in addition to taking cognizance of the legal gaps already identified, noted needs in the development of best practice, capacity, research, information sharing and building awareness.
- The implementation of Target 10 of the Global Plant Conservation Strategy, which aims to have management plans in place for at least 100 major invasive alien species that threaten plants, plant communities and associated habitats and ecosystems.
- The development of an invasive species indicator to track progress towards the 2010 Biodiversity Target – which will, of necessity, need to look at trends in invasive species.

Reporting and sharing information with a view to enabling a thorough review is, of course, one thing. Another is meeting the targets and obligations. While we may be a considerable distance from the latter, let us use the review process, not only to take stock of progress, but also to raise awareness so that we can achieve greater success in meeting the targets and objectives we have set ourselves.



# GEF support for invasive species projects

The Global Environment Facility is an independent financial organization which provides funding for projects that benefit the global environment and promote sustainable livelihoods in local communities. Since 1991, the GEF has provided \$6.2 billion in grants – and generated over \$20 billion in co-financing from other sources – to support more than 1 800 projects in 140 developing countries and countries with economies in transition.

The growing focus in recent years on the problems caused by invasive alien species worldwide is reflected in GEF's project funding. There are a host of national and regional biodiversity projects that have components dealing with invasive species threats, while some global projects address the issue to a greater or lesser extent. Examples of these include:

- Global Strategy for Plant Conservation
- Building the Partnership to Deliver the Global 2010 Indicators
- Building Partnerships to Assist Developing Countries to Reduce the Transfer of Harmful Aquatic Organisms in Ships' Ballast Water (GloBallast Partnerships).

Others are more directly concerned with invasive species. A search of GEF's online database of projects ([www.gefonline.org/projectList.cfm](http://www.gefonline.org/projectList.cfm)) using the keyword 'invasive' turns up four projects, at various stages of development or implementation. These four projects have been awarded GEF grants totalling just over US\$ 35 million.

## Building Capacity and Raising Awareness in Invasive Species Prevention and Management

GEF support for the Global Invasive Species Programme dates back to 1998, when it co-funded a project to develop best practices and disseminate lessons learned in addressing the problem of invasive species. Information gathered during this first phase of GISP was synthesized at a conference in Cape Town in September 2000, and then published as a Global Strategy document and a toolkit of best prevention and management practices.

The conference participants also helped develop an Implementation Plan for GISP's second phase, largely aimed at providing capacity building tools and training to enable developing countries to deal with invasive species. Developing countries are particularly vulnerable to the impacts of invasive species, not only because of capacity problems, but also because their economies are directly dependent on the natural resource base to a much greater extent than industrialized nations.

In keeping with this Implementation Plan, GISP has secured GEF funding for an 18-month PDF-B phase of a project that aims to build capacity and increase awareness in five pilot countries – Chile, Costa Rica, Senegal, Tanzania and Vietnam – in order to prevent, as far as possible, the incursion of invasive alien species and to manage existing and new introductions.

The anticipated overall project outcomes are:

- Strengthened national and regional capacity to coordinate and act on the prevention and management of invasive species incursion
- Increased awareness of invasive species at national and regional levels
- Improved access for stakeholders to information and expertise on scientific, technical, socio-economic, policy, legal and other aspects, including invasive species identification, prevention, eradication and control.

**The Third GEF Assembly will be held in Cape Town, South Africa, from 29 to 30 August 2006. The Assembly, held every three to four years, is the occasion for which all 176 governments participating in the Global Environment Facility meet to review and evaluate the GEF's policies, operations and membership.**

The goal of the PDF-B phase is to provide a solid foundation for the Full Project by getting a better understanding of the extent of the invasive species problems in the countries and regions concerned, identifying what needs to be done to enable them to address these problems effectively, and garnering stakeholder support.

## Control of Invasive Species in the Galapagos Archipelago

This six-year project – undertaken by Ecuador's Ministry of the Environment – is the furthest advanced of the four projects, having begun in 2001. The Galapagos Islands are renowned for their exceptional biodiversity, having specially adapted plants and animals that greatly influenced Charles Darwin's theories of evolution. The archipelago has been designated a World Heritage Site in recognition of its global significance, and much of the land and sea area has protected status. Nevertheless, biodiversity conservation has been compromised by invasive alien species, which not only cause habitat degradation but also negatively impact native wildlife through predation and competition.

The project aims at fully empowering Ecuadorian institutions charged with conserving the Islands to proactively and adaptively manage these threats, and guard against future bio-invasion by taking a precautionary approach to ecosystem management.

Its interventions seek to:

- prevent future species colonization by improving quarantine systems

- build capacity to perform targeted research, to understand the nature of current and future threats, and plan mitigation efforts
- demonstrate cost-effective means of eradicating, controlling and mitigating the impacts of invasive species through pilot projects that exemplify the spectrum of current management challenges
- build an overlay of invasive species management into sectoral development
- establish a financial mechanism to compensate for the recurrent costs of control measures, and build the capacities of management agencies to capture non-GEF investments for replicating eradication efforts
- build awareness in the archipelago and mainland regarding the problem, actively engaging local communities in planning and executing operations.

Great success has already been achieved in eradication campaigns on various Galapagos islands for feral goats, pigs, cats and pigeons, while insects such as the little fire ant *Wasmannia auropunctata* and the cottony cushion scale *Icerya purchasi* have been successfully controlled. Invasive plant species are being removed too – for example, blackberry (*Rubus* spp.) has already been eradicated, and nine other plant invaders are now being targeted.

### Removing Barriers to Invasive Plant Management in Africa

This is a four-year project that began in December 2005. It aims to reduce and eventually remove barriers to the management of invasive species through effective implementation of CBD Article 8(h) in four representative African countries.

Invasive alien species are adversely affecting biodiversity in Africa, and also threatening agricultural production and food security. Yet the problem has not been given the attention it warrants due to four main barriers: the policy and institutional environment is weak, critical information is unavailable, implementation of prevention and control measures is inadequate, and capacity is lacking.

These barriers form the basis for this intervention. In each country an enabling policy environment will be promoted through the establishment of appropriate institutional arrangements to ensure that invasive species strategies are mainstreamed; stakeholder awareness of invasive species issues will be raised and access to necessary information provided; prevention and control programmes will be established, including ecosystem management at pilot sites where invasive species threaten biodiversity, and capacity for sustainable invasive species management will be built.

The project is being executed by CABI as lead agent, with the assistance of the IUCN and in conjunction with national agencies in Ethiopia, Ghana, Uganda and Zambia, which were selected as the four pilot countries. In each of these countries, a number of sites threatened by particular invasive species will be targeted for intervention. These are:

- ETHIOPIA – Amibara District (*Prosopis* sp.), Awash River Catchment System (*Eichhornia crassipes*), Welenchiti Area (*Parthenium*)
- GHANA – Afram Headwaters Forest Reserve (*Broussonetia papyrifera*), Oti Arm of the Volta Lake (*Eichhornia crassipes*)
- UGANDA – Budongo Forest Reserve (*Senna spectabilis*), Lake Mburo National Park Area (*Cymbopogon nardus* and *Eichhornia crassipes*)
- ZAMBIA – Chunga Lagoon, Lochinvar National Park (*Mimosa pigra*), Mosi-oa-Tunya National Park area (*Lantana camara* and *Eichhornia crassipes*).

### Pacific Invasive Species Management

This project, which aims to establish an effective biosecurity system in the Pacific, is currently in the GEF ‘pipeline’. The Secretariat of the Pacific Regional Environment Programme (SPREP) has taken the lead in preparing a proposal for a PDF-B grant to initiate an 18-month information-gathering and national consensus-building phase that will inform the design of the Full Size Project. The PDF-A phase was used to form a consortium with BirdLife International and the IUCN’s Invasive Species Specialist Group (ISSG), which were involved in developing the project concept. They are also expected to play a role in the implementation of the Full Size Project, which has the following objectives:

- New invasions and establishment of invasive species are prevented at both national borders and between islands of the Pacific.
- A substantial number of the Pacific’s most critical and globally important island ecosystems are restored and sustained, contributing to a community-based movement to eradicate and control invasive species in local ecosystems throughout the region.

SPREP is already actively involved in invasive species management, as it is responsible for coordinating the implementation of two key strategies endorsed by all its member governments, namely the Invasive Species Strategy for the Pacific Islands Region, and the Pacific Islands Region Avifauna Conservation Strategy, developed under SPREP’s ongoing Invasive Species Programme and Bird Conservation Programme. In addition, a number of SPREP-supported projects being carried out in the region have an invasive alien species management component.

Since the plants and animals of most Pacific islands evolved without the presence of terrestrial mammals, the impact of introduced predators – particularly cats and rats – and of grazing animals has been particularly devastating to bird life. Other problematic invasive species include cane toads and mynah birds that were introduced to control insect pests, fish species introduced as food products, and plants introduced for soil stabilization or as potential crops.

For more information, refer to [www.the.gef.org](http://www.the.gef.org).

# The GISP Partnership Network in Action

## CAPE Invasive Alien Species Project



Leigh Potter has recently been appointed coordinator of the CAPE Invasive Alien Species Project. Leigh's main objective is to ensure the development and implementation of an effective management strategy for IAS in the Cape Floristic Region.

SANBI is the Project Management Agency for CAPE – Cape Action for People and the Environment – and the CAPE Coordinating Unit is based at Kirstenbosch. CAPE's objective is to protect the rich biodiversity of the Cape Floristic Region (CFR), and unleash its economic potential to ensure sustainable benefits to the region's people.

Invasive alien species (IAS) have been identified as a key threat to the native communities and ecosystem functioning of the CFR, so a project is being conducted under CAPE's auspices to address the issue. The project is made up of three main components:

- Improving the integration of existing IAS control efforts through the compilation of an

overall strategic and business plan for the management of IAS over all taxonomic groups and in all habitats within the CFR. One of the first steps of the project will be to assemble inventories of IAS, which can then be used for prioritization of control efforts.

- Supporting priority biocontrol, Integrated Pest Management and applied IAS research projects. The funded projects will mainly be executed by postgraduate students in order to build research capacity in these fields, while existing biocontrol facilities will be upgraded where necessary to strengthen institutional capacity.
- Pioneering techniques to control invasive alien aquatic fish species. Together with habitat degradation, invasion by alien fish species is the main causative factor for the threatened status of 15 of the CFR's 19 indigenous freshwater fish species. Three small rivers have been chosen as pilot projects for alien fish eradication.



### Weeds South Africa gave the world

A new garden at SANBI's Kirstenbosch National Botanical Gardens is helping to raise public awareness about invasive plants by displaying South African species that are invading other parts of the world. The 'weeds demo garden' includes a number of interpretive signboards and informative labels explaining the problems caused elsewhere by indigenous species such as *Agapanthus praecox*, sour fig *Carpobrotus edulis*, thatching grass *Hyparrhenia hirta*, wild dagga *Leonotis leonurus* and pig's ear *Cotyledon orbiculata*.



## The Nature Conservancy develops new alien-clearing device

The Nature Conservancy has played an instrumental role in developing a new weapon against invasive alien species. Dubbed the “super sucker”, the device acts as a giant underwater vacuum cleaner to remove alien algae, which are a serious threat to Hawaii’s coral reefs. In Oahu’s Kaneohe Bay – where the super sucker has been developed and tested – it is helping to fight the particularly destructive *Gracilaria salicornia*, which forms thick, tangled mats that smother and kill coral.

The idea for the super sucker came out of planning meetings with Department of Land and Natural Resources officials and University of Hawaii researchers, but was taken from concept to machine by The Nature Conservancy. Eric Co, the Conservancy’s marine coordinator, researched and developed the device, which is essentially a modified gold dredger that has been outfitted with a 40-horsepower diesel engine and runs on bio-diesel fuel.

The super sucker is deployed from a covered barge by a crew of five: two divers operate the suction hose underwater, while the others sort the algae topside and pack it into burlap sacks. The sacks are later delivered to two local taro-farming brothers, who have found the algae to be a superior fertilizer.

The 800 pounds of alien algae the super sucker removes in an hour is equivalent to the effort generated by 150 volunteers and 10 divers. Community-based volunteer events to remove *Gracilaria* began in earnest three years ago in Waikiki, and have since spread to other parts of Oahu. To date, 20 events involving 2 000 volunteers have removed more than 100 tons of the invasive seaweed. They have been invaluable in raising public awareness about the problems of invasive species in Hawaii, and will continue to be an important educational complement to the super sucker.

Cleaning the reef of alien algae is only half the battle, however, as *Gracilaria* quickly returns and spreads at a rate of 250 to 300 meters a year. In order to prevent any new growth, researchers plan to release native sea urchins that feed on the alien algae, and plant native algae in the cleaned areas.

For more information about this project, please refer to [www.nature.org/hawaii](http://www.nature.org/hawaii).



The “super sucker”

Photo: The Nature Conservancy

## TNC-Costa Rica tackles invasives

The Nature Conservancy recently initiated a research project on invasive species in the protected areas of Costa Rica’s Osa Peninsula. The first phase of the project will include a literature review on introduced species in the region, identification of some introduced species in the Osa Conservation Area, an assessment of their colonization status (beneficial, naturalized or invasive), and a review of their impacts elsewhere. In the second phase, three of the identified invasive species will be selected for more in-depth research on their ecology and impacts on the study area. The research project is considered a first step in developing management strategies for the target species.

The Osa Peninsula, located in the remote southwestern corner of Costa Rica, is home to all 11 of the country’s endangered mammals, at least 375 bird species and more than 4 000 plant species. It harbours spectacular collections of mangroves and the largest remaining lowland forest on the Pacific Coast of Central America, while its beaches serve as rookeries for four species of sea turtle – the green, leatherback, hawksbill and olive ridley.

In 1974 The Nature Conservancy helped the Costa Rican government purchase 86 485 acres of land and consolidate the more than 100 000 acre Corcovado National Park on the south-western flank of the peninsula. Today a third of the peninsula is protected under some form of management.

For more information, please contact the main project researcher, Claudine Sierra, at [clodin@ice.co.cr](mailto:clodin@ice.co.cr).

## CABI hones in on Himalayan balsam



CABI scientists have recently started work on two new projects on Himalayan balsam, *Impatiens glandulifera*. An annual plant that was introduced to Kew Gardens in 1839, it became a highly invasive weed after it escaped, spreading rapidly throughout the UK.

Himalayan balsam prefers moist areas, growing mainly along river banks and in damp woodlands. It often reaches a height of 2-3 metres, and has the ability to reduce biological diversity by out-competing native plants for space, light and resources. During the summer months it attracts pollinators away from native species as it produces copious quantities of sugar-rich nectar and has an extended flowering period. This form of indirect competition can reduce the genetic diversity of native species and lessen their fitness by reducing seed set. In the autumn the

plant dies back, leaving the riverbank bare and prone to erosion, while plant material that enters the river increases the risk of flooding.

CABI scientists have been contracted to assess the potential damage of Himalayan balsam on the UK's river systems, looking specifically at the impact on exposed riverine sediment habitats. Sediment that is deposited when the river is at its highest is exposed when the river returns to its normal flow. These exposed riverine sediments harbour a variety of invertebrate species, some of which are rare and endemic to this habitat.

CABI has also been asked to explore the feasibility of biological control as a management option for Himalayan balsam. The weed often grows in inaccessible and vulnerable habitats, which hinders manual control and restricts chemical application – currently the only management options available for this species. However, in its native range Himalayan balsam is kept in check by an array of herbivorous insects and plant pathogens. Scientists at CABI will therefore travel to Pakistan during the summer of 2006 to collect live specimens of these natural enemies, which will be sent back to CABI's quarantine facility at Ascot for identification and initial host-range testing.

For more information about this research, please contact project leader Rob Tanner at [r.tanner@cabi.org](mailto:r.tanner@cabi.org).



## Public health threat posed by 'la palometa peluda'



CABI's Caribbean and Latin America Regional Centre is investigating periodic infestations of the moth *Hylesia metabus* into Trinidad, and possible mitigation measures. The moth, which is commonly known as 'la palometa peluda', mainly occurs in the mangrove swamps of north-eastern Venezuela, but regularly descends *en masse* on nearby towns and offshore oilrigs as it is attracted towards light.

This presents a major public health problem, because the female moths shed large quantities of abdominal hairs, which they normally use to cover their egg masses as protection against predators and parasites. Contact with the hairs causes severe dermatitis in humans, as well as allergic reactions, breathing problems, fever, headache, nausea and conjunctivitis. Dermatological irritation can persist for up to two weeks, and is commonly known as Caripito itch. Reports of health problems caused by the moth date back to the 1930s,

when the crew of oil tankers off the coast of Venezuela were treated for "papillonite", derived from the French word for butterfly.

Starting in July 2005, Trinidad has experienced infestations of the moth at intervals of approximately three months, evidently linked to advecting wind conditions. This has resulted in temporary closure of businesses and schools, cessation of oil production and fishing activities, and widespread dermatitis. Some degree of control has been achieved in residential areas by spraying the moths with water mixed with detergent, but – based on the Venezuelan experience – the use of light traps may be a critical mitigation measure. Two strategies conducted on local oilrigs that have demonstrated promise included the use of spotlights to distract moths to unmanned rigs, and changing from fluorescent to sodium lights on manned rigs.

For more information, please contact Perry Polar at [p.polar@cabi.org](mailto:p.polar@cabi.org).



## IUCN French Committee and ISSG join forces



The familiar skyline of Bora Bora in Tahiti, French Polynesia Photo: Gautam Das

The IUCN French Committee recently launched a three-year initiative on invasive alien species in French overseas regions and territories. With some 3 450 endemic plants and 380 endemic vertebrates, these areas host a rich biodiversity of worldwide importance. Most are islands where the native fauna and flora may have evolved without the pressure of predators or competitors. This makes them particularly sensitive to the introduction of species, some of which have proven to be aggressively invasive. Indeed, invasive alien species have become a major reason for biodiversity loss in these areas.

Many stakeholders are actively trying to address the problem of invasive species. But despite their geographical and ecological differences, French overseas territories are often confronted with common difficulties, including lack of

public awareness about the problem, poorly accessible scientific data, absence of tools for coordination, and unsuitable legal instruments.

The new initiative aims to remove these stumbling blocks by encouraging exchange of information and coordination between all stakeholders involved, including NGOs, researchers, and national and local authorities. It will be carried out in collaboration with IUCN's Invasive Species Specialist Group (ISSG), and will serve as a contribution to one of the key priorities in the French Biodiversity Strategy, adopted in 2004. The three main objectives are:

- Carry out a review of available scientific, technical and legal information
- Improve the transfer of information by publishing a synthesis and best practice guide, sharing data through an online database, and organizing an exchange network
- Propose recommendations to increase awareness of the issue, to improve the legal framework and to increase funding to combat invasive alien species.

The initiative is funded by the French Ministry of Overseas Territories and Ministry of Environment, Regional Council of Réunion Island, Fondation Nature & Découvertes, and Fondation de France.

For further information, please contact Yohann Soubeyran, Invasive Species Officer for the IUCN French Committee, at [yohann.soubeyran@iucn.fr](mailto:yohann.soubeyran@iucn.fr)

## Invasive plants of the Med.

In May 2005, the first "International Workshop on Invasive Plants in the Mediterranean Regions of the World" took place in Mèze, France. IUCN-The World Conservation took the initiative to undertake a preliminary survey prior to this event by compiling lists of invasive plants and case studies of the Mediterranean area, based on 29 responses to questionnaires. The final report, *Study on Invasive Plants in the Mediterranean Basin*, was released in September 2005, and serves as a useful – although not exhaustive – documentation of invasive species issues in the region and measures being taken to address them. It comprises chapters on:

- Species inventories
- Collecting, managing and sharing information
- Eradication, containment and control

- Research and monitoring
- Cooperation
- Building awareness and support
- National policy, legal and institutional frameworks.

The study highlighted the need for common definitions for invasive species; shared databases to exchange information; partnerships with the horticulture and landscape professions; improved cooperation at the national and regional level; transfer of research results through communication and public education, and global tools for early detection and rapid response systems.



*Carpobrotus* spp. from South Africa's Cape Floristic Region are among the most problematic invasive plants on dune ecosystems of the Mediterranean Basin.

# GISP at COP 8



Director of GISP, Lynn Jackson, and GISP Chair, Dennis Rangi, at work in the GISP booth.

The 8th Conference of the Parties (COP 8) to the Convention on Biological Diversity took place in Curitiba, Brazil, from 20-31 March. GISP provided input to the discussions, participated in two side events, and distributed awareness-raising materials from its exhibition booth.

## COP 8 and invasive alien species

By Stas Burgiel

The Convention on Biological Diversity's 8th Conference of the Parties addressed a very large work programme. While the issue of invasive alien species appeared in a number of areas, including those on island biodiversity and marine and coastal biodiversity, discussions by Parties and observers on the invasives agenda item focused on two main issues: gaps and inconsistencies in the international regulatory framework addressing

invasive species, and a process for the in-depth review of invasive species scheduled for COP 9 in 2008.

**GAPS AND INCONSISTENCIES:** Building on the outputs of an *ad hoc* technical expert group and the 11th meeting of the

Subsidiary Body on Technical and Technological Cooperation, COP 8 identified a number of priority pathways for invasive species introductions, as well as issue areas requiring further guidance, including:

- Action or lack of action to address the spread of invasive alien species
- Unintended protection of invasive alien species
- Inconsistency in terminology.

Decision VIII/27 identifies other intergovernmental organizations that may have some jurisdiction over these issue areas (e.g., the International Plant Protection Convention, the U.N. Food and Agriculture Organization, the International Maritime Organization, the International Civil Aviation Organization).





**Lynn Jackson** gave an overview of the new GEF-UNEP-GISP project aimed at building developing countries' capacity in invasive species prevention and management during the GISP side event 'Partnerships in Building Capacity to Counter the Threat of Invasive Species'.

Other speakers were (from left to right): Miguel Stutzin (Chile), Moustapha Mbaye (Senegal), Ryan Hill (CBD), Le Thanh Binh (Vietnam) and Ruben Munoz Robles (Costa Rica).

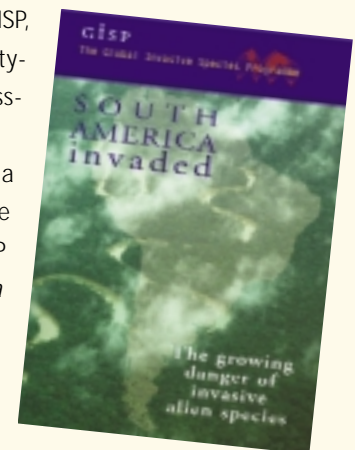


**Silvia Ziller**, Coordinator of The Nature Conservancy's South American Invasive Species Programme, delivered the introductory presentation at the GISP/TNC side event 'Invasive Alien

Species in South America: Tools and information to address national and regional threats'.

TNC's Stas Burgiel then summarised the global policy context relating to IAS, while **Dennis Rangji** gave a presentation on the role of GISP, highlighting its capacity-building and awareness-raising activities.

The side event was a fitting occasion for the official launch of the GISP publication *South America Invaded – the growing danger of invasive species*.



COP 8 also welcomed the work of GISP and the CBD Secretariat on a joint work programme involving other Conventions and IGOs, which will be further developed to address many of these gaps as well as other regional and national priority actions (mandated by Decision VI/23). SBSTTA-12 or 13 will likely continue discussions on these gaps and inconsistencies with specific attention to the issues of animals that are not pests of plants.

**IN-DEPTH REVIEW:** The 9th Conference of the Parties, scheduled for 2008 in Germany, will conduct an in-depth review of the implementation of the COP's past decisions on invasive alien species (Decisions V/8, VI/23, VI/13 and VIII/27). During the initial round of discussions, language was proposed about terms of reference for work at SBSTTA-12 and 13, yet during subsequent discussions the European Community replaced this with language stating that the CBD Secretariat would initiate the in-depth review and submit its results directly to COP 9. While the EC's effort to ease SBSTTA's over-burdened agenda is laudable, the result unfortunately

takes away two key opportunities to focus attention on necessary action to combat invasive species at the national, regional and international levels. The issue is even more pressing for developing countries, which on the one hand have fewer protections in place to protect their biodiversity, economies and livelihoods, and on the other hand lack the capacity to meet the sanitary and phytosanitary requirements for exports required by most developed countries.

The in-depth review's success will therefore depend on proactive efforts by countries and interested organizations to submit detailed information on progress and lessons learned, as well as on future priorities and capacity needs. The task will then be to develop an organized framework detailing next steps and necessary resources, while engaging the interest and commitment of states, IGOs, donors and others. To the best of its ability, the Global Invasive Species Programme will support this work by providing substantive input and technical assistance to countries in order to ensure a productive review, and ultimately to reduce the threat of invasive alien species at the national, regional and international levels.

# New perspectives on avian influenza



Photos: FAO

LEFT: A net is installed at a duck farm in Thailand to prevent contact between ducks and wild birds. RIGHT: Carcasses of culled chickens are burned at a farm in Vietnam.

The virus that causes bird flu is spread primarily by the poultry trade, but migrating wild birds can and do transport the virus over long distances.

This was the conclusion of scientists at a two-day conference convened in Rome by the UN Food and Agriculture Organization (FAO) and the World Organization for Animal Health (OIE) at the end of May.

The FAO and OIE International Scientific Conference on Avian Influenza and Wild Birds sought to shed light on the role of wild birds in spreading highly pathogenic avian influenza (HPAI). But while several presentations at the conference implicated wild birds in the introduction of the H5N1 virus at considerable geographical distance from known outbreaks in poultry, the participants could not resolve whether wild birds share responsibility for the spread of avian influenza, and whether they should now be considered a permanent reservoir of the virus.

If they are such a reservoir, there is a strong likelihood they will carry the virus with them in subsequent migrations. Alternately, H5N1 may subside naturally as infected animals die off, or it may mutate to a less aggressive form.

The participants rejected any suggestion of trying to stop the spread of HPAI by killing wild birds, stating that indiscriminate hunting or destruction of bird habitat is scientifically and ethically unjustified. Instead they stressed the need for improved surveillance and monitoring

of H5N1 in wild birds, incorporating a high-tech global tracking system (see box).

Noting that the recent outbreaks of H5N1 virus in eight African countries appeared to be based on trade – some of it illegal – in poultry mainly destined for human consumption, the participants advocated improved biosecurity and hygiene at the production level and in all poultry sectors. The need to minimise the possibility of contact between domestic and wild birds was also highlighted. Infected birds shed the virus in their saliva, nasal secretions and faeces, so poultry may contract avian influenza through direct contact with infected waterfowl or other infected poultry, or through contact with surfaces (e.g. dirt or cages) or materials (e.g. water or feed) that have been contaminated with the virus.

To date over 200 million poultry have died of avian influenza or have had to be culled, and there are concerns that the knock-on effect on the poultry trade could deal a significant blow to local, national and regional economies as the disease spreads. In many countries, fear of infection is leading consumers to shy away from poultry, throwing the multi-million dollar industry into crisis. At grassroots level, families dependent on chickens and other poultry face the prospect of their food security and livelihood being threatened.

The rapid spread of the disease means that FAO now needs \$308 million for its contribution to the \$882 million global programme for the progressive control

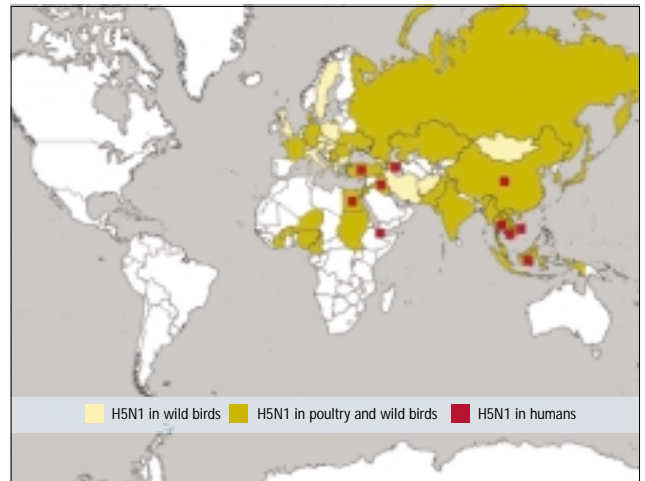


The spread of avian influenza is largely attributed to unregulated trade in poultry. Photo: FAO

of avian influenza over the next three years. The United Nations has accepted an overall coordinating role to combat the disease in poultry and the consequences of human infection, and the FAO, together with OIE, has a mandate in terms of the animal health component. This includes global and regional coordination of the programme, support to infected countries in their efforts to control the disease, assistance to countries at risk of introduction of the disease, and provision for immediate support for any newly infected country to ensure a rapid response.

The human health component of the programme is being coordinated by the World Health Organization (WHO), which is also monitoring the corresponding threat of an influenza pandemic. By the end of May, H5N1 had killed 127 humans since the first outbreaks of avian influenza in south-east Asia at the end of 2003. Nearly all of these cases were caused by contact with infected domestic fowl, but there are fears that the virus could mutate into a form easily transmitted between humans, resulting in a pandemic that would have major repercussions for the global economy through its effect on human health, trade and travel.

In March the WHO convened a meeting of international public health experts to discuss strategy in the event of an influenza pandemic emerging. The meeting focused on three



<http://www.pandemicflu.gov/>

**Nations with confirmed cases H5N1 avian influenza (May 19, 2006)**

areas: operations (the logistics for mounting such an effort), surveillance and epidemiology, and public health measures, such as quarantines, anti-viral medicines and social distancing measures. The outcomes were used to update the WHO's Pandemic Influenza Draft Protocol for Rapid Response and Containment, which aims to stop – or at least slow – the spread of pandemic influenza at the source of its emergence.

This article was compiled mainly from press releases issued by the FAO and WHO. For more information, please refer to [www.fao.org/avianflu](http://www.fao.org/avianflu) and [www.who.org](http://www.who.org).

## Plan to track migrating birds

Flying backpackers, communications satellites and a network of computers would monitor the movements of wild birds on their annual migrations under a plan proposed by the FAO. The plan is in line with recommendations made at the FAO/OIE conference on the need for better understanding of wild bird migration and the associated risks of virus introduction.

The 6.8-million-dollar plan could provide the world with crucial advance warning of the occurrence of the HPAI virus, which causes bird flu. Deploying teams of national and international veterinary and wild bird experts on the ground, it would fill a huge gap in scientific knowledge about where, when and how wild birds associated with HPAI – principally aquatic and shore birds – migrate.

The plan involves capturing thousands of wild birds before they migrate, testing sample birds for disease, and fitting some of them out with tiny backpacks weighing less than 50 grams each. After the birds are released, the sophisticated telemetry equipment inside the packs would track their every movement. A system of radio beacons and satellites would then feed data into the computers of ornithologists, ecologists,

virologists and epidemiologists around the world.

The data would show the migrating birds' exact whereabouts when they stop over on their long journeys. Mobile, ground-based teams would then re-test the sample birds for disease and, in the case of a positive return, have a good idea of where the infection originated and where it might head next.

This kind of advance warning would give governments and producers more time to respond to potential threats – with great benefits for the poultry industry and society at large. The alerts would feed into the global early warning and response system (GLEWS) developed by the FAO, together with the World Health Organization and the World Organization for Animal Health. GLEWS is already used to monitor livestock and emerging transboundary diseases such as foot-and-mouth disease, rinderpest, swine fever, ebola and Rift Valley fever.



[www.oznet.ksu.edu/](http://www.oznet.ksu.edu/)

# Global Invasive News

www.usgs.gov/



## UNITED STATES

### Carolinas confront beach vitex

The North and South Carolina Beach Vitex Task Force has launched a 'seek and destroy' mission against beach vitex, *Vitex rotundifolia*. Native to Korea and other countries in the western Pacific, the shrub was introduced to the south-eastern United States in the mid-1980s for dune stabilization. Today it occurs along much of the South Carolina coast and as far north as Ocracoke Island in North Carolina. It has also been reported from Florida, Alabama and Mississippi.

The plant forms dense monocultures, crowding out native dune plants such as sea oats and seabeach amaranth, which are just as effective as dune stabilizers. It prevents sea turtles from digging nests, and dead hatchlings have been found tangled in the growth, unable to reach the sea before becoming dehydrated. There are concerns that it will take hold in uninhabited barrier islands that are important turtle and bird nesting sites.

The plant is difficult to control as it grows rapidly, sending out runners up to 60 feet long, and can regrow from almost any part of the plant. It is a prolific producer of seeds, which can enter the surf zone and be dispersed by the sea to neighbouring beaches.

www.afsc.noaa.gov/



## HAWAII, USA

### More money to silence frogs

Efforts to rid Hawaii of coqui frogs took a leap forward in May, when the state Legislature allocated \$2 million towards their control. The coquis, *Eleutherodactylus coqui*, are native to Puerto Rico, but were introduced to Hawaii in the late 1980s, probably as hitchhikers on imported plants. Free from their natural enemies, they multiplied rapidly, reaching densities as much as three times higher than in their homeland.



www.lib.cohostate.edu

Local residents, fed up with having their sleep disturbed by the male frogs' loud 'co-KEE' calling from dusk til dawn, have rallied to join community-based eradication campaigns. Indeed, the frog is credited with helping to raise public awareness about invasive species in Hawaii, where alien plants outnumber native species.

To date, spraying the frogs with water mixed with citric acid or hydrated lime has been the preferred control method, but this only kills 80% of coquis in heavily infested areas, and the surviving population can return to former densities in as little as two months. Part of the funding allocation will therefore be used to investigate potential biocontrol agents, and researchers are already planning a trip to Puerto Rico in August to look for suitable parasites.

A further \$2.9 million has been allocated to hire 58 additional inspectors at the state's airports and harbours, in recognition of the fact that prevention is better than cure when dealing with invasive species. Regrettably though, this was countered by a slash in the budget of the Hawaii Invasive Species Council from \$4 million to \$2 million. The HISC was created in 2002 to coordinate invasive species control and prevention projects, and it has played a key role supporting invasive species committees on the various Hawaiian islands.

## NORWAY

### Stalin's crabs advance

During the 1930s, former Soviet dictator Josef Stalin reportedly hatched a plan to introduce red king crabs – also known as Kamchatka crabs – from their native North Pacific into the Barents Sea, to provide a food source for people living in Russia's barren north-west. The plan only came to fruition in the 1960s, however, when thousands of the crabs were transported by rail and sea to the waters of the Kola Peninsula. During the 1990s the population exploded, and the crabs began turning up in large numbers in the neighbouring waters of Norway. Today the 'Red Army' of crabs has advanced as far west as Norway's Troms county, 500 km from the Russian border.

No other large crustaceans occur in the area so the crabs face little competition for food, which may explain the rapid population growth. Hundreds of Norwegian and Russian fishing boats now target the crabs, as the meat is a high-priced delicacy, fetching about \$100 per kg. But there are fears that the crabs are devastating local scallop beds and might also be devouring the eggs of the capelin, a small fish that is the staple food for cod. Since cod is the main commercial fish stock in the Barents Sea, allowing the crab population to expand uncontrollably is a bit like playing Russian roulette.

Norway has therefore drawn a line in the sand some 250 km to the west of Jarfjordbotn, and is permitting fishermen to catch as many crabs as they can to the west of the line. East of the line, Russian and Norwegian fishermen have a catch limit of 3.3 million crabs for 2006. It is hoped that this fishing free-for-all will halt the crabs' relentless westward march.



## SCOTLAND

### Mink exterminated in the Hebrides

A cull of mink in the Western Isles of Scotland came to a successful conclusion in March, offering renewed hope for the conservation of internationally important birds. The first phase of the Hebridean Mink Project, costing £1.65 million, started in 2001 with the goal of clearing mink from North and South Uist, and reducing their numbers in south Harris. That has been achieved, but a further £2.5 million is needed for Phase 2, which aims to render the entire Western Isles a mink-free zone within five years.

To date, 230 mink have been caught in the Uists and 302 on Harris, but there are thought to be as many as 10 000 adult animals throughout the Western Isles. Introduced in the 1950s and '60s for commercial farming, the mink were released or escaped when the venture failed. They spread rapidly, and have been blamed for killing poultry, raiding fish farms and threatening bird colonies in the islands by eating chicks and eggs.

Fortunately, monitoring by RSPB Scotland has shown that Arctic terns are breeding more successfully in areas where the mink have been trapped and shot. Nest survival was found to be more than three times higher on the southern Uist islands, compared with that on Lewis and Harris to the north.

## SOUTH AFRICA

### Time's up for Indian house crows

Environmental authorities in South Africa are preparing to wipe out the country's entire population of alien Indian house crows. The bird was introduced to Africa in the 1890s, reportedly via Zanzibar, where it was brought to help keep the island free of rubbish. It subsequently spread along the coast by hitching lifts on ships, and is now found as far south as Cape Town at Africa's southern tip. It mainly occurs in urban and suburban environments, living in close association with humans.

Indian house crows are aggressive and opportunistic feeders, and have a devastating impact on indigenous bird populations by eating eggs and chicks, and mobbing other birds that might compete with them. They also pose a threat to human health, because they are a vector for pathogens that cause cholera, typhoid, dysentery and salmonella poisoning. They scavenge for food in rubbish dumps, informal settlements, open-air abattoirs and markets, and may contaminate food and drinking water with their faeces.

The extermination programme will be carried out during the first four months of next year, when the birds congregate after having paired off to breed from September to December. In the meantime, sites where the birds congregate are being identified. Pre-baiting will be conducted at these sites for at least two weeks before any poisoning takes place to habituate the birds and establish a regular feeding routine. This not only ensures that the birds gather at the feeding site in large numbers, but also lessens the risk of ingestion by non-target species, as the crows will chase off any other birds. Once the crows are accustomed to being fed, the food will be poisoned with starlicide, alpha chloralose and chloral hydrate, chemicals normally used in smaller dosages to tranquilize birds.

## GABON

### Investigating the blinding effect of the little fire ant

Throughout the summer of 2006, researchers with the Smithsonian National Zoo and the Wildlife Conservation Society will be investigating reports that the little fire ant, *Wasmannia auropunctata*, is behind the eye lesions and blindness that have been seen in many species of animals – including leopards, elephants, domestic cats, and tortoises – in Gabon and other parts of the world.

This ant is considered to be one of the world's top 100 invasive pests due to its ability to decrease species diversity, reduce overall abundance of flying and tree-dwelling insects, eliminate arachnid populations, decrease crop yields, and affect the health of native fauna.

The little fire ant is native to South America, where it is also considered a pest in fragmented forests and agricultural areas. It has a very painful sting in proportion to its small size. When the ant stings the eyes of vertebrates, it appears that the eyes become cloudy within a few months, and blindness can result.

The researchers will study domestic cats in ant-infested areas of Gabon, and treat the cats' eyes with steroids to better understand the nature of this disease. They will also interview local people and scientists about the effects of the ant on the health of humans, domestic animals and wildlife since its introduction to Gabon. This pilot project will establish a baseline of information on the health impacts of this invasive alien species.



Ellen Van Gelder, USCS-BRC



Aurélien Audevard - www.mangrove.com

## CHINA

### Campaign launched against destructive moth

H C Ellis, The University of Georgia, www.insectimages.org



China's State Forestry Administration announced in April that Beijing and its neighbouring provinces of Tianjin, Hebei and Liaoning would conduct an all-out campaign to control the American White Moth, *Hyphantria cunea*, over summer. The

moth is usually of only minor importance in its native range in North America, where it is known as the fall webworm, owing to the larvae's habit of spinning a large silken web over foliage on which they hatch and feed *en masse*. However, the species is a major pest in Europe and Asia, where it feeds on a wide variety of deciduous trees and shrubs, often resulting in complete defoliation. In China the moth is threatening plants and crops in 116 counties within six provinces and municipalities, but the area around Beijing is worst affected.

Forestry authorities will hire planes for aerial spraying of pesticide over target areas totalling more than 667 000 hectares. In addition, insecticidal lamps, sexual attractants, and biological control agents in the form of the American white moth virus and the parasitic bee *Chouionia cunea* will play an important role in the campaign. Posters and handbooks on the moth's prevention have also been distributed in affected areas to raise public awareness about the invader.

The moth was first detected in north-eastern Liaoning Province in 1979, but its high reproductive capacity enabled it to spread quickly. Depending upon location, between one and four generations are produced per year, with up to 3 000 eggs laid each time.



Steven Katovich, USDA Forest Service, www.insectimages.org

## NEW ZEALAND

### Budget boost for biosecurity

The New Zealand government has again demonstrated its commitment to combating invasive alien species by allocating more funding to biosecurity. Budget 2006 significantly strengthens New Zealand's ability to safeguard its major export earners from pests and diseases, and protect its unique biodiversity.

It invests an extra \$20 million for major biosecurity response preparedness, and \$13.2 million for pest management and invasive ant species surveillance over the next four years. This continues the government's trend of significantly boosting baseline biosecurity funding every year.



Steve Johnson, www.parks.tas.gov.au

## AUSTRALIA

### Kikuyu control protects penguins

Conservation officials are resuming a burning programme on Montague Island Nature Reserve over the winter months in an effort to control invasive kikuyu grass and protect thousands of penguins.

Kikuyu, *Pennisetum clandestinum*, was introduced to the island – located off the east coast of New South Wales – in the early 1900s for landscaping and soil stabilization, and to provide grazing for dairy cows and goats. It has since spread across nearly 40% of the island's southern section, in places creating a monoculture that has effectively choked out all native plant species. It is also reducing breeding areas for the more than 30 000 shearwaters, crested terns and little penguins that nest on the island, and is placing them at risk of decimation if wildfire is started by accidental causes or lightning.

Penguins are particularly threatened by the invasive grass – each year, 3% of the island's entire penguin population of approximately 6 000 pairs are fatally strangled or entrapped in the kikuyu, which is over a metre deep in some parts.

Controlled burning has been found to be the most cost-effective method of reducing kikuyu growth on the island. It also allows easier access for chemical control via ground spraying and for planting seedlings of suitable replacement species. Immediately after burning, up to 200 artificial nesting boxes will be placed in each of the designated management zones to provide breeding sites for the penguins until the native vegetation has re-grown.



## PHILIPPINES

### Janitor fish invades Ramsar site



<http://mas.er.usgs.gov/>

The sailfin catfish *Pterygoplichthys disjunctivus* – also known as the ‘janitor fish’ as it is a popular aquarium species that cleans algae off fish-tank walls – has been found in the Agusan Marsh in the interior of Mindanao Island. This is a vast complex of freshwater marshes and watercourses with numerous shallow lakes and ponds in the upper basin of the Agusan River. Part of its biodiversity-rich habitat is protected in the Agusan Marsh Wildlife Sanctuary, a Ramsar site that has been tentatively listed for World Heritage Site status.

The fish also occurs in Laguna de Bay, where the Laguna Lake Development Authority is implementing a World Bank-funded project to control its population by paying fisherfolk P10 per kilogram of the fish, which is then converted into fishmeal for pig feed. A related species, *P. pardalis*, is found in the Marikina River and Lake Paitan in the Cuyapo area of Nueva Ecija province.

Members of the genus are native to the Amazon basin of South America, but have become established in tropical and semi-tropical regions of North America, Puerto Rico, Malaysia, Indonesia and possibly other places where they were introduced. They are widely considered pests, as they are opportunistic and voracious feeders that compete with other fish, as well as bivalves and gastropods, for benthic algae and detritus. By tunnelling into pond dykes and river banks to build their nests, they increase siltation and water turbidity, with negative consequences for other plant and animal life.

## JAPAN

### Piranha find prompts pet law

The discovery of a flesh-eating piranha from South America in Lake Biwa, a popular swimming and fishing spot, prompted local lawmakers in Shiga prefecture to pass Japan’s first law against abandoning imported pets. Offenders may be jailed for a year or fined 500 000 yen.

Another pet-turned-problem animal is the raccoon, native to North America. In Kanagawa prefecture, to the south of Tokyo, the population is believed to number some 4 000, and during 2005 caused damage to agriculture of more than 15 million yen (about \$134 000). A five-year extermination plan has now been drawn up, in line with Japan’s first Invasive Alien Species Act, which came into force last year. The law also banned the importation of 40 animal and plant species, setting a maximum penalty for offenders of three years in jail, and fines of 3 million yen (\$25 750) for individuals and 100 million yen for companies. Recently the ministry expanded the list to 80 species.

The Act has had far-reaching implications. In the city of Tokushima, for example, the municipality has for nearly four decades been releasing mosquitofish into local waterbodies to control mosquitoes and the diseases they carry. But in February the Environment Ministry designated the mosquitofish a special introduced species, effectively banning its release. The city must either obtain permission by August to keep the estimated 4 000 fish swimming in its waters, or get rid of them. The species, *Gambusia affinis*, is native to the southern USA, but now occurs in approximately 70 countries worldwide, after being distributed for biological control of mosquito larvae. It is considered a pest in many countries, as it is held responsible for the decline of various species of indigenous fish, both by competing with them for zooplankton food and by preying on their eggs and larvae.

## PALAU

### Pacific Invasive Learning Network meets

In May the Pacific Island Learning Network met for the first time, marking the start of a two-year pilot programme. Set up to build the skills of multi-agency teams to address the threats posed by invasive species in the Pacific, PILN’s mission is “to empower effective invasive species management through a participant-driven network that meets priority needs, rapidly shares skills and resources, provides links to technical expertise, increases information exchange, and accelerates on-the-ground action”.

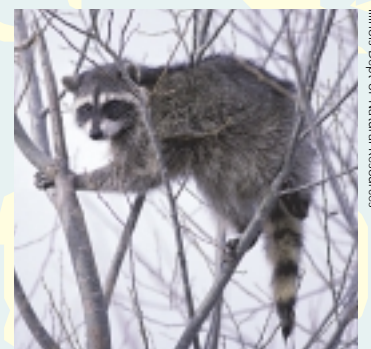
The inaugural meeting was held in Palau, and was attended by representatives from 11 countries and more than eight regional organizations. Participants analysed their collective experience to draft lessons learned in four key areas: public awareness, strategic planning, weed management and island restoration.

Each of the six PILN founding teams drafted an Action Plan for one of their priority projects and identified the next steps required:

- AMERICAN SAMOA: eradicate Strawberry Guava by the end of 2008
- GUAM: control bud rot *Phytophthora palmivora* on Betelnut
- NIUE: contain the Wedelia-affected sites within Niue to 0.7 hectares
- PALAU: remove Kebeas vine from trees along the compact road by the end of 2008
- POHNPEI: eradicate False Kava, Mile-a-Minute, Ivy Gourd, and Chain of Love by 2008
- SAMOA: secure funding to carry out activities to manage and prevent invasive species in Samoa.

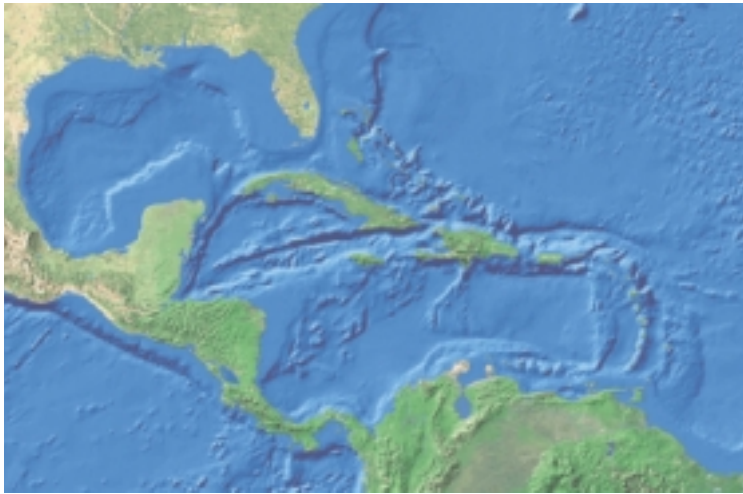


Tania Tojila [www.speep.org.ws/PILN/index.htm](http://www.speep.org.ws/PILN/index.htm)



Illinois Dept of Natural Resources

# Marine invasives in the Caribbean



UNEP-WCMC



**2006 marks the 25th anniversary of the Caribbean Environment Programme – and the year marine invasive species come under scrutiny.**

The Caribbean Environment Programme (CEP) came into being in 1981 when the Caribbean nations and territories created a legal and programmatic framework called the Caribbean Action Plan. The Action Plan led to the 1983 adoption of the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region – known as the Cartagena Convention – which has since been supplemented by three protocols addressing the specific environmental issues of oil spills, land-based sources of marine pollution, and specially protected areas and wildlife (SPAW).

Article 12 of the SPAW Protocol stipulates that each Party should take appropriate measures to regulate or prohibit intentional or accidental introduction of non-indigenous species that may cause harmful impacts to the natural flora, fauna or other features of the Wider Caribbean Region. To date, however, little has been known about the status of marine invasive species beyond a few examples, such as the green mussel *Perna viridis*. Indeed, a 2003 compilation of invasive species in the Caribbean by Kairo and co-authors listed only 18 marine invaders. It was concluded that there was a gap in knowledge regarding the status of introduced organisms in the marine environment, and the threat that these may constitute.



The green mussel *Perna viridis* is one of the Caribbean's better-known marine invasive species. Photo: Debi Ingrao

The Caribbean Regional Coordinating Unit (UNEP CAR/RCU) – based in Kingston, Jamaica – has therefore commissioned the Caribbean and Latin America Regional Centre (CLARC) of CAB International (CABI) to undertake a desk study to “produce a compilation of information on national and regional capacities and experiences on marine invasive species management programmes in the Wider Caribbean, including ballast water management”. Information is being collated from various public domain sources, and a questionnaire aimed at capturing up-to-date facts and figures was widely circulated.

CABI has also prepared a proposal for a GEF-funded PDF-A grant to develop a full-size project on “Mitigating the threats of invasive alien species in the insular Caribbean”. The project would include marine invasives and ballast water issues, but also address terrestrial species that represent a significant threat to island biodiversity in the Caribbean.

Meanwhile, UNEP CAR/RCU sponsored a regional scoping meeting in Venezuela in February in support of preparatory activities for the second phase of the GEF-UNDP-IMO Global Ballast Water Management Project. Entitled “GloBallast Partnerships”, the aim of the second phase is to assist particularly vulnerable countries and regions to enact legal and policy reforms to meet the objectives of the International Convention for the Control and Management of Ships’ Ballast Water and Sediments. At the Global Inception Meeting held in London in July 2005, the Wider Caribbean Region was identified as one of the higher priority regions for Phase 2 intervention due to the high ship traffic and biodiversity in the region, and the potential risk from ballast water mediated bio-invasions.

The main outcome of the regional scoping meeting was the endorsement of the GloBallast Partnerships project, and identification of issues of regional concern from a maritime and biodiversity/invasive species perspective. These issues, together with the Wider Caribbean Region’s specific capacity-building needs, will be taken into account by IMO during preparation of the final project document.

For more information, please refer to the Caribbean Environment Programme website: [www.cep.unep.org](http://www.cep.unep.org).

# Second chance for the Senegal River



*Salvinia molesta*

Photo: Mississippi Department of Marine Resources

**At the start of the new Millennium, it seemed the Senegal River was in real trouble. Invasive waterweeds choked the river, severely impacting the livelihoods of the local people as well as the delta's rich biodiversity. Biocontrol beetles saved the day, but now a new threat lurks.**

In 1985 the Diama Dam was built near the mouth of the Senegal River to regulate flows during the rainy season and prevent the intrusion of seawater during the dry season. This created ideal conditions upstream of the dam wall for invasion by fresh-water weeds, first by water lettuce *Pistia stratiotes* in 1992, and then by giant salvinia *Salvinia molesta* in 1999.

Dense mats of the weeds interfered with rice cultivation, clogged water-supply and irrigation schemes, and impeded access to water by rural communities, livestock and wildlife. By blocking waterways they obstructed boat traffic and fishing activity, and posed a health risk by providing suitable habitat for mosquitoes, snails and other vectors of disease. The blanketing cover of weeds reduced light penetration into the water column and inhibited gaseous exchange between the air-water interface, resulting in an overall decline in water quality and a reduction in aquatic biodiversity.

The invasions also threatened habitat for the rich bird life of the Senegal River delta, a World Heritage Site that has been designated a Wetland of International Importance under the Ramsar Convention. Senegal's Parc National des Oiseaux du Djoudj (Djoudj National Bird Sanctuary), and the adjacent Parc National du Diawling (Diawling National Park) on the Mauritania side of the river, provide protection for some three million migrant birds and a large population of resident breeding birds.



*Cyrtobagous salviniae*  
Photo: USDA, Scott Bauer

Military personnel and community volunteers made a valiant effort at controlling salvinia using physical methods, but this costly and labour-intensive approach was clearly unsustainable. The benefits of biological control had already been demonstrated by the weevil *Neohydronomus affinis* on water lettuce in the Senegal River, so in May 2000 the first batch of *Cyrtobagous salviniae* weevils were released for salvinia biocontrol. Within two years salvinia had been successfully brought under biological control, and the weed is no longer considered a problem in the river. Unfortunately, 2005 saw a resurgence of water lettuce, necessitating a new release of *N. affinis*.

Mr Ousseynou Diop, head of the plant forecasting division in the Ministry of Agriculture's Plant Protection Directorate, is undertaking a quantitative post-release evaluation of these biocontrol programmes as part of his PhD on the management of invasive aquatic weeds in Senegal. He will also investigate the role of eutrophication in the proliferation of water weeds, and make recom-

mendations for the integrated management of water resources in Senegal. This information is important for controlling the indigenous bulrush *Typha australis*, currently the most problematic plant species in the river system because it is able to take full advantage of high nutrient concentrations and regulated water levels.

Mr Diop also aims to raise public awareness and train local communities about invasive water weeds. This is a particularly pressing task, given that the world's worst aquatic weed is waiting in the wings to take over as enemy number one. Water hyacinth *Eichhornia crassipes* has already been introduced as an ornamental plant for garden water features in the capital city of Dakar, and it is only a matter of time before it escapes into the Senegal River.

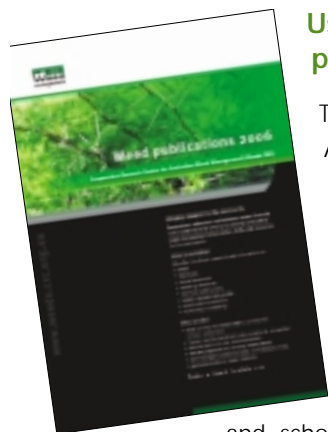


Community volunteers helped clear salvinia



# New Releases

## User-friendly catalogue of weed publications



The Cooperative Research Centre for Australian Weed Management, popularly known as Weeds CRC, has produced a colourful catalogue of its publications on weed management. Apart from books, technical series and workshop proceedings, *Weeds Publications 2006* includes factsheets, newsletters, weed management guides, training materials

and school resources, many of them available online. *Weeds Publications 2006* can be downloaded from: [www.weeds.crc.org.au/documents/publications\\_catalogue\\_2006.pdf](http://www.weeds.crc.org.au/documents/publications_catalogue_2006.pdf).

## Two new offerings from the World Bank Biodiversity Series

*National and regional legislation for promotion and support to the prevention, control, and eradication of invasive species* by Tomme Rosanne Young

This paper examines the nature of the need for national legislative action that can support the identification, prevention, eradication and remediation of invasive species. It aims to begin developing a frame of reference for legal and administrative understanding of the range of invasives issues and possible governmental responses. It recognises that it is insufficient to rely on laws against invasive species, or simply to impose liability for the harms they cause. Legislation must at a minimum be directed at means of identifying invasives and their roles and uses in society, and setting appropriate limits on activities and species that might create invasive problems, now or in the future.

After a brief introduction on the need for control and the international response, an overview of some of the key global developments in the field is provided. The legislative tools available for the control of species introductions and invasive species are then

examined in greater detail, and the special challenges faced by developing countries discussed.



## The Aid Trade: International assistance programs as pathways for the introduction of invasive alien species

by Sean Murphy and Oliver Cheesman of CABI BioScience, UK Centre

International assistance programmes are known to have facilitated both deliberate and unintentional introductions of invasive alien species (IAS) in the developing world, although the available information is scattered, poorly documented, and difficult to come by. In this review, a preliminary assessment is made of IAS problems resulting from 'aid' programmes, which include those aimed at agricultural development, disaster relief, and military assistance, such as peace-keeping operations.

Numerous examples of IAS introductions through these pathways are provided in the report, but it is stressed that an urgent and fuller assessment is needed on the nature and severity of the threat, with particular focus on vectors and pathways of movement. This information is vital for the development of effective prevention and early detection schemes. In the interim, some immediate actions are recommended, including awareness raising about IAS, promoting voluntary codes of conduct, and developing risk assessments for species being considered for deliberate introductions.

## Online journal launched

*Aquatic Invasions* is a new online journal focusing on biological invasions of the inland and coastal waters of geographic Europe. The journal provides the opportunity for timely publication of first records of biological invaders, for consideration in risk assessments, early warning systems and eradication programmes. Technical reports and other accounts not publishable in regular scientific journals, including large datasets of aquatic invasive species records from monitoring and biological surveys, will also be available.

The journal is published on behalf of the International Association of Theoretical and Applied Limnology (SI) under the auspices of the European Research Network on Aquatic Invasive Species (ERNAIS). It can be downloaded from: <http://www.aquaticinvasions.ru/>.





## New book on biocontrol

### *Environmental Impact of Invertebrates for Biological Control of Arthropods: Methods and Risk Assessment*

edited by F. Bigler, D. Babendreier and U. Kuhlmann

This book provides an invaluable

review of the current methodologies used for assessing the environmental impacts of invertebrate biological agents used to control pests in agriculture and forestry. It explores methods to evaluate post-release effects and the environmental impact of dispersal, displacement and establishment of invertebrate biological control agents. It covers methodology on screening for contaminants, the use of molecular methods for species identification, and the determination of interbreeding. The book also discusses the use and application of information on zoogeographical zones, statistical methods and risk-benefit analysis. It gives practical advice on how to perform science-based risk assessments and on how to use new technology and information.

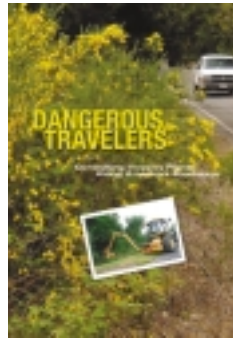
The 288-page hardcover book costs £60.00/\$110.00, and can be ordered from CABI Publishing.

## More than just abstracts

CABI recently launched its CAB Abstracts Plus ([www.cabi-publishing.org/cabplus](http://www.cabi-publishing.org/cabplus)), an online database providing comprehensive information on animal science, nutrition, plant science, agriculture and the environment. Built around the CAB Abstracts database, the new facility offers many extra features. For example, Full Text Select already contains over 8 000 complete articles, with many more to come. Much of this literature has until now been unavailable in electronic format, or not permanently stored online.

Another component is CAB Reviews, comprising concise overviews of particular fields of research. More than 100 specially commissioned reviews are added each year to the database, which also contains an archive of over 3 000 reviews dating back to 1930 and made available electronically for the first time.

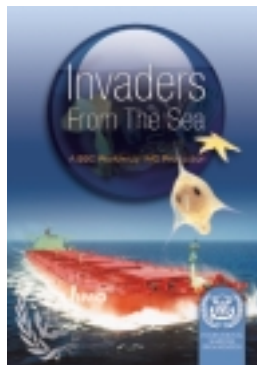
The database also contains up-to-date pest distribution maps and authoritative descriptions of fungi and bacteria prepared by CABI scientists and other experts. An archive facility allows trends in pest behaviour to be identified as far back as 1964.



## Dangerous Travelers

The first in a series of videos on best management practices for invasive species prevention has been released by the USDA Forest Service and partner organizations. *Dangerous Travelers – controlling invasive plants along America's roadways* is designed as a training tool for road maintenance crew and equipment operators, but is highly informative for anybody wanting to learn more about prevention and control of invasive plants.

The video outlines the best management practices that the road crews should be following in their day to day activities, such as identifying plants, developing inventory systems, mapping infestations, cleaning equipment, and controlling weeds through mechanical removal and herbicide treatment. The 26-minute video can be downloaded free of charge from: <http://www.fs.fed.us/invasivespecies/news.shtml>.



## Invaders from the Sea

In March, the International Maritime Organization (IMO) launched a documentary on ballast water as a vector for the introduction of invasive species. Produced on IMO's behalf by the BBC Natural History Unit, *Invaders from the Sea* captures the dramatic impact of aquatic invasives on economies, the environment and human health, using as examples the North American comb jelly in the Caspian Sea, the golden mussel in South America, and harmful algal blooms in South Africa.

The documentary is intended to raise public awareness about the ballast water issue, and encourage governments to implement the International Convention for the Control and Management of Ships' Ballast Water and Sediments, adopted by the IMO in 2004. It features some of the solutions to preventing the spread of invasive species in ships' ballast water, including exchange of ballast water on the high seas and new technologies that are under development. These include flow-through systems to continuously exchange ballast water while the ship is sailing, and methods to kill or inactivate microscopic life forms, such as treatment with ozone or ultraviolet light.

The documentary will be distributed by IMO through the United Nations film distribution channels in developing countries, while BBC Worldwide has the exclusive rights to distribute it in the developed countries. Further information can be obtained by contacting IMO's Public Information Services staff at [media@imo.org](mailto:media@imo.org).

# People against invasives

## Sean Murphy



As a globally recognized expert in invasive species prevention and management, Sean Murphy brings a variety of skills to his role as a GISP Board Member, not least of which is his experience in international programme and project development, and his track record in securing funding from a wide variety of agencies.

Sean is leader of Invasive Species Management at CABI UK Centre (Ascot), and although he now spends much of his time working on generic invasive species issues, he continues his involvement in more specific project-type activities, mostly in tropical Asia. He has a lot to contribute, given his considerable experience in biological control and integrated pest management programmes on a range of crops, as well as in natural ecosystems.

Sean was awarded his PhD in Zoology and Applied Entomology from Imperial College, University of London, in 1980. He began his long association with CABI in 1983, when he joined its Caribbean & Latin American Regional Centre in Trinidad. He subsequently relocated to the Africa Regional Centre in Kenya, where he led the coffee programme and later the tropical agroforestry research programme. In 1990 he moved back to the UK, and has been based at CABI's UK Centre in Ascot, Berks, ever since, although his project management work has taken him to countries around the globe.

Sean has published over 60 research papers, reviews and books, and a global database that he helped develop formed the basis for an FAO website on invasive trees. Most recently he co-authored a World Bank Biodiversity Series Paper on the role of the 'aid trade' in invasive species introductions (see page 20).

Sean is married with two teenage daughters. When time permits, he enjoys running and general natural history.

## John Randall



Alternate member of the GISP Board, John Randall, might well have become a marine scientist rather than an invasive species specialist, as his early research – for which he earned his MSc – was on primary production in a Louisiana estuary. But two stints as an intern at the National Tropical Botanical Garden in Hawaii opened his eyes to the terrible toll

that invasive species have on native communities, so for his PhD he changed direction, studying the biology and control of invasive bull thistle *Cirsium vulgare* in Yosemite Valley.

John joined The Nature Conservancy in 1991 after obtaining his PhD from the University of California, Davis, where he is still based, having a courtesy appointment with the Department of Plant Sciences. His first post at TNC was as Invasive Weed Specialist, responsible for providing information, advice and assistance to TNC land managers across the United States. In 2000 he was appointed Director of the Wildland Invasive Species Team, made up of staff located in a number of TNC centres in the US, and in 2004 was selected as Director of TNC's newly established Global Invasive Species Initiative. The initiative uses a variety of approaches aimed at preventing and abating invasive species threats, including promoting best management practices, collaborating with commercial and private interests to voluntarily change practices that introduce invaders, and lobbying for policy to strengthen regulations, incentives, funding and agency actions.

John still finds time to participate in research on invasive species biology and control, most recently investigating the effects of *Apis mellifera* honeybees on seed set in both native and alien plants.

When he's not working or spending time with his wife and two teenage daughters, John likes putting on his running shoes or getting on his bicycle to hit the roads of sunny California.

## IAS events highlights:

### NEOBIOTA

The NEOBIOTA working group's 4th European Conference on Biological Invasions will take place in Vienna, Austria, from 27 to 29 September 2006. The theme of this year's conference, 'From Ecology to Conservation', will focus on two main topics:

- Conservation of Biodiversity, covering prevention and monitoring; control and eradication measures; pathways and vectors; policy and legislation; awareness building
- Ecology of Invasive Alien Species, covering distribution and abundance; patterns and processes; impact and risk assessment; human and animal health impact.

### 15th AUSTRALIAN WEEDS CONFERENCE

The 15th Australian Weeds Conference will take place at the Adelaide Convention Centre in South Australia from 24 to 28 September 2006. The conference has the theme of 'Managing Weeds in a Changing Climate', and will include special symposia on climate change, international advances in crop weed management, achieving social and policy change in weed management, and animal dispersal and use of weeds. Keynote speakers include Professor Harold Mooney of Stanford University, USA, and Professor Dave Richardson of University of Stellenbosch, South Africa.

## Overview of upcoming IAS events

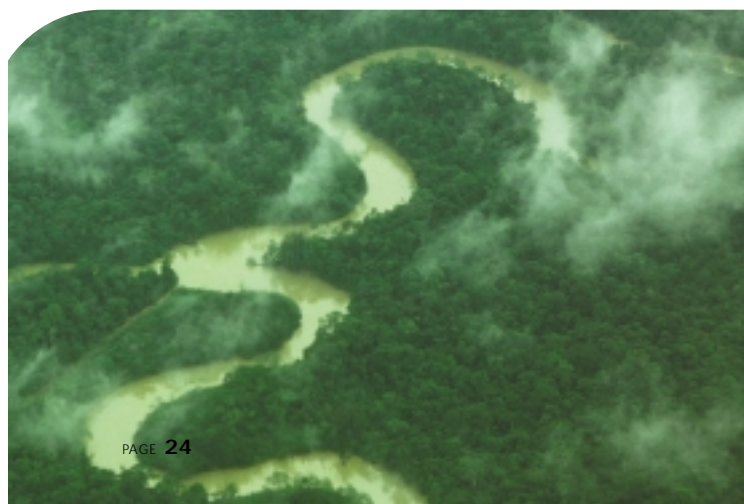
DATE	EVENT	WHERE	CONTACT DETAILS
<b>2006</b>			
3-7 July	Meeting of the IUFRO Working Party on Alien Invasive Species and International Trade	Radom, Poland	<a href="http://iufro-down.boku.ac.at/iufrofronet/d7/wu70312/ev70312.htm">http://iufro-down.boku.ac.at/iufrofronet/d7/wu70312/ev70312.htm</a>
9-13 July	Beyond Borders: Forest Tree Rusts From A Global Perspective	Lake Tahoe, California, USA	<a href="http://www.ndsu.nodak.edu/instruct/walla/China-IUFRO/2006Announcement.html">http://www.ndsu.nodak.edu/instruct/walla/China-IUFRO/2006Announcement.html</a>
10-14 July	11th International Conference on Plant Pathogenic Bacteria	Edinburgh, UK	<a href="http://www.csl.gov.uk/contact/acppb.cfm">http://www.csl.gov.uk/contact/acppb.cfm</a>
17-21 July	4th International Bacterial Wilt Symposium	York, UK	<a href="http://spcs.org.uk/ibws/form.htm">http://spcs.org.uk/ibws/form.htm</a>
17-21 July	International Symposium on Intractable Weeds and Plant Invaders	Ponta Delgada, Azores	<a href="http://www.db.uac.pt/%7Eiswipi/">http://www.db.uac.pt/%7Eiswipi/</a>
23-26 July	20th North American Prairie Conference: invasive species as they affect the prairie ecosystem	Kearney, Nebraska, USA	<a href="http://nappc2006.org/">http://nappc2006.org/</a>
30 July-5 August	15th International Congress of the International Union for the Study of Social Insects	Washington DC, USA	<a href="http://www.iussi.org/IUSSI2006.html">http://www.iussi.org/IUSSI2006.html</a>
9 -10 August	Mid-Atlantic Exotic Pest Plant Council Annual Meeting	Morristown, New Jersey, USA	<a href="http://www.ma-eppc.org/">http://www.ma-eppc.org/</a>
13-18 August	National Plant Board 2006 Annual Meeting	Milwaukee, Wisconsin, USA	<a href="http://www.nationalplantboard.org/meetings.html">http://www.nationalplantboard.org/meetings.html</a>
27-30 August	Australasian Aquaculture 2006	Adelaide, South Australia	<a href="http://www.was.org/meetings/WasMeetings.asp">http://www.was.org/meetings/WasMeetings.asp</a>
10-15 Sept	7th International Symposium on Fruit Flies of Economic Importance	Salvador, Brazil	<a href="http://www.fruitfly.com.br">http://www.fruitfly.com.br</a>
11-14 Sept	IPPC 18th Technical Consultation among Regional Plant Protection Organizations	Rome, Italy	<a href="http://www.ippc.int/IPPC/En/default.htm">http://www.ippc.int/IPPC/En/default.htm</a>
18-21 Sept	North American Weed Management Association 14th Annual Conference	Calgary, Alberta, Canada	<a href="http://www.nawma.org/">http://www.nawma.org/</a>
19-20 Sept	Meeting the Challenge: Invasive Plants in PNW Ecosystems	Seattle, Washington, USA	<a href="http://depts.washington.edu/urbhort/html/invasives/homepage.htm">http://depts.washington.edu/urbhort/html/invasives/homepage.htm</a>
24-28 Sept	15th Australian Weeds Conference: Managing weeds in a changing climate	Adelaide, Australia	<a href="http://www.plevin.com.au/15AWC2006/">http://www.plevin.com.au/15AWC2006/</a>

DATE	EVENT	WHERE	CONTACT DETAILS
27-29 Sept	4th European Conference on Biological Invasions: NEOBIOTA – From Ecology to Conservation	Vienna, Austria	<a href="http://www.umweltbundesamt.at/neobiota">http://www.umweltbundesamt.at/neobiota</a>
3-4 Oct	2006 Tamarisk Research Conference: Current Status and Future Directions	Fort Collins, Colorado, USA	<a href="http://www.tamarisk.colostate.edu/">http://www.tamarisk.colostate.edu/</a>
5-7 Oct	California Invasive Plant Council (Cal-IPC) Symposium 2006	Sonoma, California, USA	<a href="http://www.cal-ipc.org/symposia/index.php">http://www.cal-ipc.org/symposia/index.php</a>
9-12 October	OIE Global Conference on Aquatic Animal Health	Bergen, Norway	<a href="http://www.oie.int/eng/Norway2/home.htm">http://www.oie.int/eng/Norway2/home.htm</a>
November	OIE/SEAFDEC Hands-on Training Workshop on Aquatic Animal Disease Diagnosis	Iloilo, Philippines	<a href="http://www.oie.int/eng/manifestations/en_manifs.htm">http://www.oie.int/eng/manifestations/en_manifs.htm</a>
9-12 Nov	ESSP Global Environmental Change Open Science Conference	Beijing, China	<a href="http://www.essp.org/ESSP2006">http://www.essp.org/ESSP2006</a>
18 Nov	Ecological Impacts of Non-Native Insects and Fungi on Terrestrial Ecosystems	Montreal, Canada	<a href="http://nofc.cfs.nrcan.gc.ca/files/newsletter2_e.pdf">http://nofc.cfs.nrcan.gc.ca/files/newsletter2_e.pdf</a>
20-24 Nov	IPPC Standards Committee Meeting	Rome, Italy	<a href="http://www.ippc.int/IPP/En/default.htm">http://www.ippc.int/IPP/En/default.htm</a>
21-24 Nov	18th Conference for the OIE Regional Commission for the Americas	Florianopolis, Brazil	<a href="http://www.oie.int/eng/en_index.htm">http://www.oie.int/eng/en_index.htm</a>
27-29 Nov	Canadian Weed Science Society Annual Meeting	Victoria, BC, Canada	<a href="http://www.cwss-scm.ca/coming_events.htm">http://www.cwss-scm.ca/coming_events.htm</a>
<b>2007</b>			
26 February-2 March	World Aquaculture Society: Aquaculture 2007	San Antonio, Texas, USA	<a href="http://www.was.org/meetings/WasMeetings.asp">http://www.was.org/meetings/WasMeetings.asp</a>
23-27 April	12th International Symposium of Biological Control of Weeds	Montpellier, France	<a href="http://www.cilba.agropolis.fr/symposium2007.html">http://www.cilba.agropolis.fr/symposium2007.html</a>
21-24 May	5th International Conference on Marine Bioinvasions	Cambridge, Massachusetts, USA	<a href="http://mit.edu/seagrant">http://mit.edu/seagrant</a> or <a href="http://massbay.mit.edu">http://massbay.mit.edu</a>
18-21 June	14th European Weed Research Society Symposium	Hamar, Norway	<a href="http://www.ewrs.org">http://www.ewrs.org</a>
1-5 July	21st Annual Conference of the Society for Conservation Biology	Port Elizabeth, South Africa	<a href="http://www.conbio.org/2007">http://www.conbio.org/2007</a>
17-21 Sept	9th International Conference on the Ecology and Management of Alien Plant Invasions (EMAPI9)	Perth, Australia	<a href="http://www.congresswest.com.au/emapi9/">http://www.congresswest.com.au/emapi9/</a>
October	21st Asian Pacific Weed Science Society (APWSS) Conference	Colombo, Sri Lanka	<a href="http://peaches.nal.usda.gov/insp/conf.asp">http://peaches.nal.usda.gov/insp/conf.asp</a>
15-18 October	16th International Plant Protection Congress	Glasgow, UK	<a href="http://www.bcpc.org/iapps2007/">http://www.bcpc.org/iapps2007/</a>

This list is compiled largely from a monthly update provided by Dr Richard Orr, Assistant Director for International Policy and Prevention of the National Invasive Species Council, Washington, DC. Please send an e-mail to [Richard\\_orr@ios.doi.gov](mailto:Richard_orr@ios.doi.gov) to join the mailing list or have your IAS event included.

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*We are grateful to those who have kindly made their photographs available for awareness-raising purposes.*



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