Abstracts and Speakers

2017 Wetland Restoration Section Annual Symposium

Restoration Meets Ramsar: Ensuring the Best from the Best for Internationally Important Wetlands from the Mountains to the Sea (Parts 1 and 2)

San Juan, Puerto Rico

The Ramsar Convention's guidance on wetland restoration: Policy and practice

Robert McInnes

In 2002, the Conference of the Parties to the Ramsar Convention agreed a formal set of principles and guidelines for wetland restoration (adopted as the annex to Resolution VIII.16). In the intervening 15 years, wetlands have continued to be degraded and lost at an alarming rate; hence the need for wetland restoration may never have been greater. In addition to the adopted Ramsar guidance there is also a plethora of material, including manuals, guidebooks, websites, peer-reviewed papers, to name just a sub-set of the available resource, available for wetland restoration practitioners and policy-makers. Through the use of case studies, including examples from Sri Lanka, Tanzania and Myanmar, the paper will review progress with the links being made between the use of guidance and the development of policies, at the local and national levels, and the implementation of wetland restoration on the ground. It will also seek to answer the question, 'Does the presence of good guidance result in good wetland restoration policies and practice?'

Is mitigation banking consistent with the objectives of the Ramsar Convention?

Royal Gardner

The Ramsar Conference of the Parties adopted general principles and guidelines for wetland restoration in Resolution VIII.16 (2002). A decade later, in Resolution XI.9 (2012), the Ramsar Conference of the Parties adopted guidelines for avoiding, mitigating and compensating for wetland losses, and in doing so discussed the concept of mitigation banking. To what extent is the practice of mitigation banking consistent with these resolutions and with the general objectives of the Ramsar Convention? This presentation explores that issue in the context of Corkscrew Swamp Sanctuary, a Ramsar Site located in southwest Florida, owned and managed by Audubon of Florida. Designated in 2009, the 13,000-acre site is North America's largest remaining virgin bald cypress forest. Home to 600-year-old cypress trees, it also provides habitat to nearly 200 species of birds and 22 species of threatened or endangered orchids. An interesting feature (at least for this symposium) is that part of the site consists of the former lands of Panther Island Mitigation Bank, a private entrepreneurial venture. Corkscrew Swamp Sanctuary is the first-and may be the only-Ramsar Site that contains area restored and preserved as part of a mitigation bank.

Addressing the cultural aspects of wetland restoration

Dave Pritchard

The Ramsar Convention in recent years has developed a thriving programme on the relationship between culture and wetlands, including a global Culture Network. This is expanding the Convention's repertoire of policy, guidance and information on the value basis for wetland conservation, its synergies with other bodies such as the World Heritage Convention, its strategic orientation on issues such as traditional and indigenous knowledge systems, and its engagement with local communities. This paper will relate these perspectives to wetland restoration, helping to broaden and deepen the understanding that Ramsar brings to this issue, and the effectiveness of its contribution to achieving the UN Sustainable Development Goals.

Challenges of what to restore at the mouth of the Murray River, Australia

Peter Gell

The natural ecological character of a wetland of international significance is defined at the time of nomination to the Ramsar List. This description is largely based on the knowledge of contemporary biological communities and the nature of the wetland's hydrology and cultural value at the time. This level of understanding may have varied between sites and nations. Consistent with this identification of a snapshot condition is the pursuit of the time-of-listing condition as the target for any necessary restoration measures. Paleolimnological approaches reveal that wetlands have experienced considerable pre-Anthropocene change on account of cyclical and seral changes in climate, geomorphology and hydroecology. Further, the Millennium Ecosystem Assessment document overwhelming post-industrial degradation to the world's wetlands. So, adherence to a static 'condition' will almost certainly result in wetland change relative to a single baseline and investment in efforts to restore wetlands to what may be an unrepresentative and unrealistic target. An understanding of the longer record of condition change, and a greater focus on wise use, ecosystem services and Ramsar criteria, will allow nations to accept a range of suitable past, and future target states, and manage for ecological function without excusing obligations to address the drivers of wetlands degradation over recent, and earlier, times. The changing nature of a large Ramsar sites at the mouth of Australia's Murray River is used to illustrate the dynamic nature of wetlands and the options for site management, including whether past baselines are relevant or not.

Assessing mangrove decline in Northern Australia – Management responses?

Max Finlayson

Dieback of mangrove wetlands across northern Australia's coastline has been recorded in 2015/2016 and led to concerns about the impact of climate on their long-term condition. Changes were initially detected along the coastline of the Gulf of Carpentaria and then also in the iconic Kakadu National Park. The causes have been explored and attributed to a deviation in prevailing environmental conditions associated with an El Nino event that started in May 2016 and was reinforced by warming in the Indian Ocean, and may be a consequence of human-induced climate change. Comparisons using a combination of data acquired over the park between 1991 and 2011 suggested that the total area occupied by mangroves had remained relatively similar over these decades although there had been significant redistribution as a consequence of storm damage (losses) and colonisation of accreted sediments and upper reaches of creeks (gains) as a consequence of changing hydrological conditions and sea level rise. However, those changes were relatively minor compared to the dieback observed in 2015/2016, as quantified through field survey and time-series data. The extent, timing and rate of dieback in the park have been investigated, giving an indication of whether recovery is occurring and also provides evidence that such changes might have taken place in previous decades, albeit not to the same extent. We then consider some of the management responses given the occurrence of past change and the feasibility of direct restoration. While changes in the mangrove forests are likely to have detrimental ecological, economic and social implications there is no certainty that an effective coastal monitoring and management strategy will be implemented given these areas are isolated and contain limited infrastructure, although the application of Earth Observation approaches could address some of the monitoring needs.

The San Francisco Estuary Ramsar site: The technical challenges of restoring its tidal marshes

Stuart Siegel

The San Francisco Estuary is a 158,711-hectare Ramsar site designated in 2013. The Estuary is the

largest on the Pacific coast of the U.S. and encompasses a UNESCO Biosphere Reserve and several National Wildlife Refuges and State Wildlife Areas, holds more than 75% of California's remaining estuarine wetlands, is a major stop for migratory birds on the Pacific flyway, and is a migratory corridor for an active commercial salmon fishery. At the same time, it is the most urbanized estuary in the U.S., with a population over 7.5 million around its shores and another 6.5 million in its watershed that comprises 40% of California, is host to several ports, naval facilities, bayshore petroleum refineries and other industries, 6 million acre feet or about a third of its winter and spring freshwater inflows are diverted each year to agriculture, urban, and industrial uses, its shoreline is ringed by road and rail infrastructure, and 90% of the aquatic species are non-native. Of the 77,000 hectares of estuarine wetlands at statehood in 1850, only about 6,500 hectares of that original marsh remain, the rest lost to fill or diked and drained for agriculture or salt production. 14,500 hectares have newly formed on tidal mudflats through natural deposition of sediment derived largely from hydraulic mining in the Sierra Nevada in the late 19th century. 20,000 hectares have been filled. The Estuary's tidal marsh restoration goal is 25,000 hectares, with about 8,500 hectares restored so far. Much of the past restoration and most of the future restoration is intended to achieve a range of ecological functions and ecosystem services, including endangered species recovery, fish and wildlife habitats, water quality enhancement, flood attenuation and protection, shoreline protection, carbon sequestration, and recreation. The technical challenges of achieving these restoration goals in the face the Estuary's complex setting are manifold and include major issues such as maintaining tidal flood protection, reversing subsidence, protecting existing valued habitats and natural resources including when convert tide lands to marsh, integrating with urban flood and shoreline protection demands, and providing appropriate recreation and public access. Restoration practitioners have devised a range of strategies to tackle these challenges and are developing and testing new approaches in response to new pressures from rising sea levels and increased storm intensities.

Can the Everglades survive climate change? Envisioning the Everglades under climate change, sea level rise

Hilary Flower

The Everglades National Park is a Ramsar Site and the focus of the multi-billion dollar Comprehensive Everglades Restoration Plan. To succeed, this plan must build ecosystem resilience to climate change and sea level rise. In this project we provide screening-level analysis of the ecological ramifications of an increase or decrease of rainfall by 10%. Both of these future scenarios include a warming of 1.5 C and sea level rise of 0.5 meter relative to conditions in 2010. We used these climate variables as input to the Ecological Landscape Model to simulate a large suite of plausible ecosystem responses. In this marine-influenced subregion: water depth and salinities increased under both scenarios along a topographic-influenced gradient , as the press of sea level moved the oligohaline isoline landward; phosphorus accumulation rate generally increased under both scenarios , due to higher phosphorus concentrations in marine sources; peat accretion rate tended to decrease due to interactions of changing habitat types, altered nutrient availability, and increased salinity - and thus some decreases in plant productivity/turnover averaged over decadal time scales. Freshwater marsh (e.g., sawgrass) area decreased under both scenarios and was largely replaced by either mangroves (ca. 70,000 ha, decreased rainfall scenario) or by open water/ deep slough habitat (116,000 hectares, increased rainfall scenario). Adaptive planning efforts that foster upward peat accretion may help support both mangrove and freshwater marsh habitats. We infer that ecological effects related to sea level rise may occur in extremely oligohaline water, that

topography will control the incursion of this zone as sea level rises, and that differences in freshwater availability will have ecologically significant effects within the oligohaline zone.

Agriculture and Mediterranean wetlands

Patrick Grillas

In the Mediterranean basin, a hotspot of biodiversity, wetlands are important and diverse ecosystems supporting biodiversity and providing numerous services to local populations. These wetlands are negatively affected by various forms of human pressures. The Mediterranean Wetlands Observatory (MWO) set up under the aegis of the MedWet initiative of the Ramsar Convention (www.ramsar.org) and aims to convince decision-makers to take the appropriate measures for their preservation and sustainable management. The knowledge synthesis produced by the MWO provided an overview of the situation of Mediterranean wetlands. Between 1975 and 2005, the surface area of natural wetlands in the Mediterranean region decreased by 10%. Agricultural expansion is the primary direct cause of wetland surface loss. However, urbanization, beside direct impact on wetlands, acts as an indirect driving pressure, encroaching on agricultural land. Irrigated agriculture has an additional effect on water availability and quality, especially in the Southern Mediterranean countries. Artificial wetlands (i.e. ricefield, fish ponds, and reservoirs) have increased steadily in parallel to the decline of natural wetlands. The biodiversity of Mediterranean wetlands show contrasting trends. One group of birds (colonial water birds) showed a strong increase in populations (perhaps due to better protection) while all other groups of bird and of vertebrates exhibit a severe decline and many wetland species are threatened with extinction. The most opportunistic bird species can use artificial wetlands where they may benefit from eutrophication and the abundance of exotic invasive species (fish, crayfish notably). Rice fields can provide suitable feeding habitat for some birds species during the breeding season (e.g. Ardeids, Mallard, Ã¢â‚¬Â¦) which show positive trends of their populations. Extensive grazing contributes to maintain suitable habitats for wildlife in wetlands. However, most other groups (passerine, amphibians, reptiles, Ã¢â‚¬Â¦) show a decline of their populations in Mediterranean wetlands. The changes that affect wetlands and their biodiversity also impact human well-being, by reducing the many services wetlands provide. The expected increasing pressures driven by climate change and demographic trends could result in increasing degradation of wetlands unless the services they provide to populations are fully recognized, and actions to maintain them are taken accordingly.