

Brazil seeks a unique ecotourism certification system

Ecotourism is widely touted as the one example of an approach that most easily provides for sustainable economic development and the protection of biodiversity. The reality is often otherwise because the money rarely stays in the local community and the environmental impacts of tourism can be extremely damaging. To make the reality of ecotourism complement conservation goals better, >100 organizations in Brazil are forming a Sustainable Tourism Council (<http://www.ecoamericas.com/english/story.asp?storyid=390>).

This Brazilian council is unique because it operates independent of the government and the tourism industry and has, as its stakeholders, a mix of ecotourism operators, environmental advocates and indigenous rights groups. Of particular interest is the emphasis that this council is placing on transparency, because other efforts aimed at certifying ecotourism have been criticized for being developed behind closed doors and held captive to single special interest groups. *PK*

World's biggest rainforest reserve

On the eve of the World Summit on Sustainable Development in Johannesburg, the Government of Brazil announced that it is creating the world's largest rainforest reserve. Located in northern Amazonia near French Guiana, the Tumucumaque Mountains National Park will span nearly 3.9 million ha – an area larger than Belgium.

Forests in the remote region of Brazil's Amapá state are still largely in a pristine state and contain diverse wildlife populations, including harpy eagles, jaguars and many species of primates. The new park will adjoin three large indigenous reserves in Amapá, with the four reserves collectively totaling almost 11 million ha – one of the largest protected-area complexes in the world.

Designation of the park is among the last actions of outgoing Brazilian President Fernando Henrique Cardoso, whose Government has made advances in environmental protection but has also been criticized for its aggressive program of Amazonian development. *WFL*

Salmon decisions lacked science backing

A recent report from the US National Academy of Science (<http://www.nap.edu>) finds that the US Fish and Wildlife Service and National Marine Fisheries Service lacked scientific justification for recent regulations regarding flow rates in the Klamath River in Oregon. The restricted flow rates were controversial because they diverted water from irrigation ditches during a dry year to protect salmon and sucker fish that have been listed as threatened or endangered under the US Endangered Species Act (ESA). Upon release of the report, public responses included numerous remarks such as, 'it is too bad thousands of farm families had to lose their livelihood before it was proven the federal agencies were wrong' (<http://www.nationalcenter.org/TSR20402.html>).

The press and many who would challenge the enforcement of the ESA have used the report to question whether science is aptly used by Government agencies, and the Congressional Research Service is preparing a report for the 108th Congress that discusses the role of science in the ESA. Sadly, the public discussion to date has lacked a thoughtful appreciation for the difference between 'scientific proof' and 'best available science'. *PK*

Rampant logging in Cambodia

In recent years, Cambodia has opened up much of its forest for commercial logging, but the results have been an economic and environmental fiasco, according to a recent report by the Cambodian Development Resource Institute (<http://www.cdri.org.kh>).

The report argues that loggers are rapidly overcutting forests, harvesting far more timber than is sustainable and failing to follow required 25-year intervals between cutting cycles. As a result, the country's timber supplies are being quickly exhausted.

Moreover, revenues from logging have been far lower than expected. The Government predicted that logging taxes would yield US\$100 million y^{-1} , but annual revenues have never exceeded US\$12 million. The report urges the Government to terminate the timber leases of law-breaking companies and to use the returned land for community forestry, watershed management, ecotourism and biodiversity conservation. *WFL*

Bush argues that more logging is needed to prevent forest fires

Proclaiming that 'in order to have a healthy economy, you have to have a healthy forest policy', President George Bush Jr is championing more logging and less regulations as his 'Healthy Forest Initiative' (<http://www.whitehouse.gov/news/releases/2002/08/20020822-3.html>).

Bush justifies this 'streamlining' of environmental laws and excusing of US Forest Service projects from judicial review as a necessary step to prevent the rampant forest fires that plagued western North America this past summer. Environmentalists point out that there is little science to justify any connection between enhanced commercial logging and reduced fire risk (http://www.nativeforest.org/press_room/release_8_22_02.htm).

Missing is the realization that ecologists are only just beginning to understand what factors might determine long-term fire cycles and their impacts on forests, especially in light of probable global warming and its implications for drought frequency. *PK*

Australia: an environmental 'renegade'?

A large coalition of conservation organizations in Australia has lambasted the nation's environmental record, arguing that, in virtually every indicator of environmental health, the country is moving backwards. These criticisms were leveled in a report that contradicts assertions by conservative Prime Minister John Howard that the country has made important strides in environmental management.

Based on official Government data, the report *In Reverse* (<http://www.wilderness.org.au/>) asserts that, on a per-capita basis, Australia leads the world greenhouse-gas emissions and has a higher rate of land clearing than any other wealthy nation. The rapid degradation of inland waters and loss of wildlife habitats are also identified as key concerns.

Among the keenest criticisms in the report is the decision by the Howard Government to join the USA in withdrawing from the Kyoto Protocol on reducing greenhouse gases. Asserting that Australia's greenhouse emissions had grown by >17% since 1990, the report argued that, over the

past decade the country has changed from being an enthusiastic participant in international environmental accords to a 'renegade state'. WFL

Colombia's model wetland restoration at risk

One of the world's greatest restoration success stories is at risk because of funding cuts (<http://www.ecoamericas.com/english/story.asp?storyid=392>). The estuarine wetlands and mangrove forests fed by the Magdalena River in Colombia were nearly

wiped out in the mid-1990s because of roads and dikes blocking normal flow regimes. Between 1995 and 1998, >US\$25 million dollars were spent to re-establish the normal hydrology, with immediate benefits realized in terms of recovering fisheries and mangroves. Unfortunately, this effort depends on continual dredging, and the Colombian Government stopped the dredging program in 1998. At risk is the livelihood of 25 000 families that depend on the fisheries of this wetland, as well as a National Park and wildlife sanctuary that are home to threatened sapphire hummingbirds, crocodiles and the West Indian manatee.

The more general lesson here is the growing realization that successful restoration often requires uninterrupted and continuous investment, because degraded ecosystems are often so altered that they can never be restored to a self-sustaining system. PK

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Letters

Genetic population divergence: markers and traits

In a recent review in *TREE* [1], McKay and Latta survey the literature for studies examining adaptive population divergence using molecular markers (F_{st}) and quantitative genetic trait variation (Q_{st}). Although their paper dealt primarily with theoretical considerations, the authors also presented a large data set in an attempt to elucidate patterns that exist in nature. They show that Q_{st} is on average larger than F_{st} and that, across studies, the relationship between Q_{st} and F_{st} is weak. This last result is in contrast to our review of the literature [2] where we show a strong positive relationship between Q_{st} and F_{st} . We believe that this discrepancy stems from several errors made by the authors.

In Table 1, McKay and Latta give Q_{st} and F_{st} estimates derived from 29 species: 16 were obtained from published reviews, including ours, whilst 12 were new (the *Pinus sylvestris* estimate could not be verified). Of these 12 estimates, five (references [49–52, 54–59] in [1]) were for species in which Q_{st} and F_{st} estimates were derived from separate studies involving different, nonoverlapping populations frequently measured years apart. We see no rational reason why these studies should be included, because F_{st}/Q_{st} -based divergence studies are population and generation specific and cannot be generalized to all populations of a species. Furthermore, the *Sequoiadendron* ([60] in [1]) estimate of quantitative divergence was based on ANOVA results, in which

percent variation explained by population was used rather than a formal calculation of Q_{st} . Similarly the *Phlox* (Table 5 in [53] in [1]) estimate of quantitative trait divergence was based on phenotypic rather than genetic variation, even though a formal breeding design was conducted; therefore it is not an estimate of Q_{st} . Additionally, the *Picea glauca* (46) F_{st}/Q_{st} estimates were incorrectly given (reported = 0.36/0.035, correct = 0.098/0.014). Finally, we were unable to obtain the same results for the correlation between F_{st}/Q_{st} presented in the legend to Fig. 1 [1] (reported: $r=0.363$, $P=0.053$; our calculation: $r=0.451$, $P=0.014$). These errors bring into question the validity of the results and conclusions presented by the authors.

In a re-analysis of the data excluding the seven inappropriate species and correcting the *Picea glauca* F_{st}/Q_{st} estimates, we found a positive and significant relationship between F_{st}/Q_{st} : $r=0.52$, $df=21$, $P=0.013$. When we updated our original data set [2] with five new estimates from [1] and a further two unpublished estimates, we found a similar positive relationship: $r=0.59$, $df=24$, $P=0.002$.

In closing, we found that the inclusion of studies inappropriate to the hypothesis outlined in the McKay and Latta paper, masked a highly significant, positive relationship between molecular marker and quantitative genetic trait variation for population divergence.

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Genetic population divergence: markers and traits

Response from Latta and McKay

In our review [1] we summarized data of mean Q_{ST} and F_{ST} for 29 species and questioned the assertion that F_{ST} and Q_{ST} are strongly correlated [2,3]. Note that correlation of log-transformed values [1] is less than that for the untransformed values [3], which violate the assumption of normality. We argued that divergence in markers (F_{ST}) is a poor predictor of divergence in locally adaptive traits (Q_{ST}), and gave theoretical reasons why such a relationship should not be expected.

Crnokrak and Merilä [4] suggest that our choice of studies accounts for the lack of strong correlation. Each review [1–3] includes studies using broad-sense estimates of Q_{ST} ; and/or assumptions about heritability within populations, thus departing somewhat from the strict assumptions of theory relating Q_{ST} and F_{ST} .