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GREY PLOVER

Ahmed Hassaan Zuhair

Local Name: Alaka

Scientific Name: *Pluvialis squatarola*

Scientific Classification

Kingdom: Animalia

Phylum: Chordata

Class: Aves

Order: Charadriiformes

Family: Charadriidae

Genus: *Pluvialis*

Species: *P. squatarola*



Photograph courtesy Richard T Mills

Description:

The face and neck of these birds are black with a white border. They have a black breast and a white rump. The tail is white with black barring. The bill and legs are black.

The inner flanks and axillary feathers at the base of the underwing are black, a feature which readily distinguishes it from the other *Pluvialis* species in flight. They also have larger, heavier bills.

The Grey Plover is found mainly on marine shores, inlets, estuaries and lagoons. They forage for food on beaches and tidal flats, usually by sight. The food consists of small molluscs, polychaete worms, crustaceans, and insects. Eggs are laid in a shallow scrape, lined with stones and vegetation. They breed and lay eggs once a year.

Protected Bird:

Grey Plover is a protected bird in Maldives. This bird was protected on 22 May 2003 under Environment Protection and Preservation Act of Maldives (Law No: 4/93). Catching, maltreating, trading and keeping nesting grounds of the bird are prohibited in the country.

LESSER GOLDEN PLOVER

Ahmed Hassaan Zuhair

Local Name: Funamaa Dhushin

Scientific Name: *Pluvialis dominica*

Scientific Classification

Kingdom: Animalia

Phylum: Chordata

Class: Aves

Order: Charadriiformes

Family: Charadriidae

Genus: *Pluvialis*

Species: *P. dominica*



Photograph courtesy Mike Watson

Description:

These birds have dark brown upper parts, spangled with gold to pale yellow or whitish. A white stripe extends from the forehead, over the eyes, to the wings. These birds are highly migratory. They are found in coastal mudflats and estuaries, and adjacent salt marshes and fields.

These birds forage for food on tundra, fields, beaches and tidal flats, usually by sight. They eat insects and crustaceans. They nest on the ground in a dry open area.

Protected Bird:

Lesser Golden Plover is a protected bird in Maldives. This bird was protected on 22 May 2003 under Environment Protection and Preservation Act of Maldives (Law No: 4/93). Catching, maltreating, trading and keeping nesting grounds of the bird are prohibited in the country.

RUDDY TURNSTONE

Ahmed Hassaan Zuhair

Local Name: Rathafai

Scientific Name: *Arenaria interpres*

Scientific Classification

Kingdom: Animalia

Phylum: Chordata

Class: Aves

Order: Charadriiformes

Family: Scolopacidae

Genus: *Arenaria*

Species: *A. interpres*



Description:

Ruddy Turnstone is a small wading bird. It is a highly migratory bird, 7 to 10 inches in length. They have rusty orange and black back and wings. Belly and underparts are white. The legs are fairly short and are bright orange in color. They exhibit bold black and white wing pattern in flight.

As their name suggests, turnstones often forage by turning over stones and pebbles. While searching for crustaceans, these birds often dig holes larger than themselves. They usually breed in exposed rocks or reefs and in sandy beaches. The female lays two to four eggs at a time. Eggs hatch after twenty-two to twenty-four days.

Protected Bird:

Ruddy Turnstone is a protected bird in Maldives. This bird was protected on 22 May 2003 under Environment Protection and Preservation Act of Maldives (Law No: 4/93). Catching, maltreating, trading and keeping nesting grounds of the bird are prohibited in the country.

SHORELINE DYNAMICS

Maldives Environment Management Project

This article is an extract from the report “Coastal Monitoring, Reef Island Shoreline Dynamics and Management Implications” (2010) prepared by Dr Paul Kench for the Environmental Protection Agency and funded by the Maldives Environmental Management Project.

Alternate strategies for shoreline management

There are a number of solutions to manage island shorelines that have not had considerable uptake in the Maldives and should be considered as additional interventions or viable alternatives. There have been few attempts to consider and trial the use of non-structural solutions for shoreline management in the Maldives. These solutions can be divided into two groups which reflect the timescale at which they would be effective.

Short-term strategies: To date there has been only a limited use of soft engineering options to manage shoreline stability. In particular, nourishment of shorelines is a nonstructural solution that is unlikely to promote adverse environmental effects. Consideration of nourishment should include:

- Beach nourishment: where material is placed on the beach to add sediment to the coastal system.
- Nourishment of the island ridge: in this approach sediment is placed on the island margin and is vegetated to add sediment volume to the island surface. This approach provides the opportunity to offset potential flooding hazards.

Both approaches rely on replenishing the sediment reservoir of the coastal/island system.

As with structural solutions nourishment requires ongoing maintenance as it does not solve the cause of erosion.

Medium-term strategies: These strategies are designed to operate over decadal timescales with the primary purpose being to protect people, infrastructure and assets from erosion and flooding. The approach is based on the premise that protection for island communities is dependent on the width of the island that separates community assets from the ocean, which acts as a buffer to erosion.

Design and implementation of such a strategy requires identification of a minimum island buffer zone and ongoing monitoring. For example, where the width of vegetated backshore is greater than 5 m it is advocated that shoreline monitoring occur to provide improved

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resolution of the rate of shoreline change. Where the width of the vegetated backshore is less than 5 m direct intervention may be required. This approach provides time to consider and evaluate the best approach to mitigate erosion. Such strategies should consider:

- Zoning and Relocation of Asset. Analysis of the rate of shoreline change and lifetime of the asset at risk should allow for an informed decision as to whether the asset can be relocated landward away from the active shoreline.
- Short-term strategies: A thorough analysis of the possible use of a range of short-term solutions should be undertaken. This should give equal consideration to the alternative soft engineering solutions and relocation and zoning.

WASTE AUDIT IN THE NORTH REGION

Maldives Environment Management Project

In the process of designing the solid waste management system for the North Region under the Maldives Environmental Management Project, a waste audit was carried out by the project in 2011 to determine the types and quantity of solid waste that is produced on 5 inhabited islands and 1 resort as a representative sample.

It was through this process that the size of the incinerator to be placed on the site of the Regional Waste Management Facility to be located at Raa Vandhoo was determined, and it also helped to identify the equipment needed for the Island Waste Management Centres on the inhabited islands in the region.

The islands on which the Waste Audit was carried out are Hinnavaru, Naifaru, Eydhafushi, Maalhos, Lhohi and Komandoo Resort. Out of these the first three have relatively large populations, while Maalhos and Lhohi are less populated islands, and Komandoo is a small resort.

The number of households audited on each island

- 15 households on each of the islands with large populations
- 10 households on each of the islands with small populations

A comparison was done with previous audits that have been completed such as the JAICA audit that was done in 2008, and by the Red Cross and other agencies in about 5 year intervals in Male' and other islands.

It is apparent from the comparisons that the levels of waste produced have not gone up significantly in the last 5 years, as the composition found here is very similar to those studies as well. There are also no new categories of waste, such as e-waste, which are seen to be very problematic in other places around the world.

One of the findings is that resorts have generally maintained a waste generation level of approximately 3.5kg per guest per day. On the other hand, the average waste produced on the islands is 0.11kg per person per day.

In the island households, organic waste comprises the largest portion of waste, at 66%, while resort organic waste registered at 74%. The next highest value category for households is the 'other' category at 13%, whereas the next highest for resorts is paper and card, at 10%.

News

A RAIN FOREST ADVOCATE TAPS THE ENERGY OF THE SUGAR PALM

*Marianne Lavelle, National Geographic News
June 22, 2011*

One of Indonesia's most ardent rain forest protection activists is in what may seem an unlikely position: Spearheading a project to produce biofuel from trees.

But tropical forest scientist Willie Smits, after 30 years studying fragile ecosystems in these Southeast Asian islands, wants to draw world attention to a powerhouse of a tree—the Arenga sugar palm. Smits says it can be tapped for energy and safeguard the environment while enhancing local food security.

Smits says that the deep-rooted feather palm *Arenga pinnata* could serve as the core of a waste-free system that produces a premium organic sugar as well as the fuel alcohol, ethanol, providing food products and jobs to villagers while it helps preserve the existing native rain forest. And scientists who have studied the unique harvesting and production process developed by Smits and his company, Tapergie, agree the system would protect the atmosphere rather than add to the Earth's growing carbon dioxide burden.

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"The palm juice chiefly consists of water and sugar—made from rain, sunshine, carbon dioxide and nothing else," says Smits. "You are basically only harvesting sunshine."

The project, being funded in part by a 73,160 euro grant (U.S. \$105,000) from National Geographic's Great Energy Challenge initiative, has potential to disrupt a cycle of poverty and environmental devastation that has gripped one of the most vulnerable and remote areas of the planet, while providing a new source of sustainable fuel.

Source: <http://news.nationalgeographic.com/news/energy/2011/06/110623-tapergie-sugar-palm-biofuel/>

IEA OUTLOOK: TIME RUNNING OUT ON CLIMATE CHANGE

**Mason Inman, National Geographic News
November 9, 2011**

The world has only about five years to make a dramatic turnaround in policies if it is to avoid severe impacts of climate change, according to the International Energy Agency (IEA).

The IEA's annual World Energy Outlook, released today, looks at what would be required to keep global warming below 3.6°F (2°C), a threshold many countries have pledged to stay below.

"We're increasingly pessimistic," said Richard Jones, deputy executive director of the IEA and a former U.S. diplomat.

"We've been trying to warn our member countries," which includes most of the industrialized world, Jones said. "It's getting harder and harder to meet this target."

To have a good chance of staying below that amount of warming, the world has only a certain budget of emissions it can use—the equivalent of about 1 trillion tons of carbon dioxide emissions by mid-century.

The infrastructure the world is building today—including power plants, buildings, and factories—is based largely on burning fossil fuels, the main contributor to emissions of carbon dioxide (CO₂), the primary greenhouse gas, the report noted.

Once built, infrastructure usually stays in place until it wears out—so what we build now will "lock in" emissions for decades to come, the IEA argues.

The infrastructure already built today or in the planning stages would, over the coming decades, emit 80 percent of all the CO₂ the world can afford to release into the air.

To keep emissions below that target, civilization could continue with business as usual for only five more years before the total allowed budget of emissions would be "locked in." In that case, to meet the targets for warming, all new infrastructure built from 2017 onward would have to be completely emissions-free.

"We can still act in time to preserve a plausible path to a sustainable energy future," said IEA Executive Director Maria van der Hoeven. However, she added, "Each year the necessary measures get progressively tougher and viciously more expensive."

False Economy

The report's conclusion is "a pretty stark message," Jones said. "The key thing is to get policies in place by 2017" for a massive switch to low-carbon infrastructure.

That's because longer delays would mean that more infrastructure would have to go "out to pasture," or be retired before its normal lifetime was up, he added.

And retiring infrastructure early would mean that avoiding dangerous climate change would cost much more money.

For that reason, the report argues, "Delaying action is a false economy."

"We estimate that for every dollar you don't spend today" on low-emissions infrastructure, Jones said, "in the future you have to spend four."

Because of this high cost of later action, the report said, meeting the climate target would be "much more difficult and expensive, or even, in terms of practical politics, impossible."

To achieve these targets, more than half of all new energy sources installed from now on would have to be renewables such as solar and wind, the IEA forecasts. To ramp up renewables that quickly would require large subsidies, rising on a fast pace to reach \$250 billion a year by 2035—four times today's level.

Even at that level, those subsidies would be less than half as much as the world spends now on fossil fuel subsidies, according to IEA estimates.

Meeting the targets would require increasing nuclear power as well. So far, Japan's Fukushima disaster has damped enthusiasm for nuclear power in Europe, but elsewhere has had very little impact, with Russia, China, India, and other countries still planning large growth of nuclear power, the report said.

The climate targets would also require growing use of natural gas in place of coal—but the IEA has argued that this would be possible, because new technologies such as hydraulic fracturing have dramatically increased recoverable supplies.

Room to Maneuver

Because of the lock-in from infrastructure, meeting the climate target is a tall order, said Richard Newell, an energy economist at Duke University and former director of the U.S. Energy Information Administration.

"Even if it were technically possible, it is not economically or politically realistic," Newell said.

"Unless something significant changes about our energy technologies, markets, and policies," he added, "current trends lead to an energy future that looks very much like the present. Just bigger-much bigger."

The IEA's analysis comes to a very similar conclusion as other studies, including one published last year in Science.

"It is clear that the energy infrastructure already in existence doesn't leave us with much room to maneuver under current climate benchmarks," said Steven Davis, a climate researcher at Carnegie Institution for Science in Stanford, California, and lead author of the earlier study.

"The transition to energy infrastructure that doesn't emit CO₂ to the atmosphere will take time, something that is in short supply."

Source: <http://news.nationalgeographic.com/news/energy/2011/11/111109-world-energy-outlook-2011/>

SEAWEED'S "CHEMICAL WEAPONS" KILLING CORALS

New culprit found in reef decline, study says

*Brian Handwerk, National Geographic News
October 17, 2011*

Warming oceans, coastal pollution, and even sunscreen have been blamed for the perilous state of the world's coral reefs. Now scientists have added another coral-killing culprit to the mix: seaweed.

A new study of reefs around the Fiji Islands found that some seaweed causes coral bleaching and suppresses photosynthesis by emitting anti-coral chemicals. Such seaweed could be helping to curb coral growth on reefs worldwide, the study authors say.

During the last several decades, scientists have observed numerous coral reefs being conquered by seaweeds. But experts haven't been sure if the algae contributed to coral decline or simply benefited from it.

"Now our research suggests that, once corals decline due to a combination of global and local stresses, some seaweeds use chemical warfare to suppress the recovery of remnant adult corals and new coral recruits," said study co-author Douglas Rasher, a doctoral candidate at the Georgia Institute of Technology in Atlanta.

Killer Seaweed Aided by Overfishing, Runoff

It's unlikely that seaweed developed chemical weapons specifically to attack coral, since interactions between the two organisms have been historically infrequent on pristine reefs, Rasher said.

"We hypothesize that [seaweeds] may have evolved to produce these compounds on their surfaces in response to competition with microbes or attacks from [grazing animals], which they've been fighting for millions of years," he explained.

"It's only in ecologically recent times—perhaps over the last 30 or 40 years—that seaweeds have begun to have an impact on corals."

Two main forces are thought to be driving the seaweed boom on reefs. In some cases, agricultural and sewage runoff dumps large amounts of nutrients on near-shore reefs, stimulating algae growth.

In other cases, including at Rasher's study site in Fiji, seaweed may be gaining a foothold due to overfishing of algae-eating species. For instance, near each coastal village Rasher studied there's a marine protected area, with no fishing allowed, right next to unprotected reefs that are open to fishing.

"You often see the unprotected reefs dominated by macroalgae [i.e., seaweed], with corals and fish biomass being suppressed," he said.

"This seems to be a consistent pattern along the coasts where we're working, so you can see the [juxtaposition] even at a local scale, within a few kilometers."

Algae-Eaters Needed to Protect Reefs

Rasher and his advisor, Mark Hay, hope their research can help reef managers understand which algae are harmful to coral and highlight ways to reverse the trend of seaweed growth.

"For years we have seen patterns suggesting that seaweeds might be chemically damaging corals," Hay said.

"Doug's work finally demonstrates that it is chemical, [reveals] what those chemicals are, and [shows] which fishes best control the most chemically aggressive seaweeds."

Rasher added that Fiji's protected marine reserves could naturally supply new coral larvae to adjacent reef habitats, although the situation is unlikely to improve if seaweeds continue to suppress new coral recruits.

"Our results suggest that bans on the harvest of seaweed-eating fish may decrease algal abundance on the degraded reefs and thus make these reefs more prone to coral re-establishment," he said.

Source: <http://news.nationalgeographic.com/news/2011/10/111017-coral-reefs-fiji-seaweed-chemical-warfare-animals-science/>

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Birds protected in Maldives under the Environment Protection and Preservation Act: 4/93

 Ruddy Turnstone <i>Arenaria interpres</i>	 Lesser Golden Plover <i>Pluvialis dominica</i>	 Gray Plover <i>Pluvialis squatarola</i>	 Lesser Sand Plover <i>Charadrius mongolus</i>	 Great Sand Plover <i>Charadrius leschenaultii</i>	 Common Ringed Plover <i>Charadrius hiaticula</i>	 Glossy Ibis <i>Plegadis falcinellus</i>	 Whimbrel <i>Numenius phaeopus</i>	 Red-throated Pipit <i>Anthus cervinus</i>	 Tree Pipit <i>Anthus trivialis</i>
 Black Bittern <i>Dupetor flavicollis</i>	 Yellow Bittern <i>Ixobrychus sinensis sinensis</i>	 Black-crowned Night Heron <i>Nycticorax nycticorax</i>	 Crab Plover <i>Dromas ardeola</i>	 Curlew Sandpiper <i>Calidris ferruginea</i>	 Common Greenshank <i>Tringa nebularia</i>	 Black-tailed Godwit <i>Limosa Limosa</i>	 Marsh Sandpiper <i>Tringa stagnatilis</i>	 Black-headed Gull <i>Larus ridibundus</i>	 Pallas's Gull <i>Larus ichthyæus</i>
 Ferruginous Pochard <i>Anthya nyroca</i>	 Kentish Plover <i>Charadrius alexandrinus</i>	 Garganey <i>Anas querquedula</i>	 Yellow Wagtail <i>Motacilla flava</i>	 Nothern Shoveler <i>Anas clypeata</i>	 Brown Booby <i>Sula leucogaster</i>	 Red-footed Booby <i>Sula sula</i>	 Western Reef Egret <i>Egretta gularis</i>	 Maldivian Little Heron <i>Butorides striatus albidulusi</i>	 Maldivian Pond Heron <i>Ardeola grayii philippi</i>
 Greater Flamingo <i>Phoenicopterus ruber</i>	 Purple Heron <i>Ardea purpurea</i>	 Black Headed Heron <i>Ardea melanocephala</i>	 Eurasian Spoonbill <i>Platalea leucorodia</i>	 Cattle Egret <i>Bubulcus ibis</i>	 Masked Booby <i>Sula dactylatra</i>	 Central Maldivian Heron <i>Butorides striatus dicii philippi</i>	 Black-winged Stilt <i>Humantopus himantopus</i>	 Jack Snipe <i>Lymnocyrtus Minimus</i>	 Pacific Golden Plover <i>pluvialis fulva</i>
 Audubon's Shearwater <i>Puffinus thiermerieri</i>	 Lesser Crested Tern <i>Sterna bengalensis</i>	 Great Crested Tern <i>Sterna bergii</i>	 Nothern House Martin <i>Delichon urbica</i>	 Maldivian Water Hen <i>Amauromis Phoeniceus maldivus</i>	 Common Moorhen <i>Gallinula chloropus indicus</i>	 Caspian Tern <i>Sterna caspia</i>	 House Sparrow <i>Passer domesticus</i>	 Wilson's Storm-petrel <i>Oceanites oceanicus</i>	 Watercock <i>Gallinex cinerea</i>
 White Tern <i>Gygis alba monte</i>	 Black-naped Tern <i>Sterna sumatrana</i>	 Gull-billed Tern <i>Gelochelidon nilotica</i>	 Great Lesser Frigatebird <i>Fregata ariel</i>	 Lesser Frigatebird <i>Fregata minor</i>	 Whiskered Tern <i>Chlidonias hybridus</i>	 Sooty Tern <i>Sterna fuscata</i>	 Saunders's Tern <i>Sterna saundersi</i>	 White-tailed Tropicbird <i>Phaethon lepturus</i>	 Flesh-footed Shearwater <i>Puffinus carneipes</i>
 Common Tern <i>Sterna hirundo</i>	 Roseate Tern <i>Sterna dougalli</i>	 Brown Noddy <i>Anous stolidus</i>	 Spot-billed Pelican <i>Pelecanus philippensis</i>	 Great Egret <i>Casmerodius albus</i>	 Common coot <i>Fulica atra</i>	 Wedged-tailed Shearwater <i>Puffinus pacificus</i>	 Asian Koel <i>Eudynamis scolopacea scolopacea</i>	 Bridled Tern <i>Sterna anaeethetus</i>	 Lesser Noddy <i>Anous tenuirostris</i>