

GLOBAL CORAL REEF ALLIANCE

A non-profit organization for protection and sustainable management of coral reefs

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Re: your request for information on the NOAA/NMFS ESA petition for 83 species

Dear Ms. Moore,

As a coral researcher who has dived for 54 years all over the Caribbean, Indian Ocean, and Pacific, I feel that this petition trivializes a fundamental and VERY urgent need for protection with a thoroughly wrong-headed legalistic approach that is both seriously scientifically flawed and fundamentally counter-productive. What is needed is a whole-ecosystem strategy that protects ALL corals, not just an un-justifiable subset of them.

First, the list appears arbitrary: there is little or no solid justification for this particular list of species. Coral species with large populations and widespread distributions are listed, and other species, often among the closest relatives to those listed, but far more rare and restricted in distribution, are ignored.

Second, the fundamental threats to ALL corals, global warming, new diseases, and land-based sources of pollution, as well as the more popularly described local stresses, do not discriminate among species and single out those listed, but affect ALL coral species. I have the world's largest collection of coral reef photographs from the 1940s, 1950s, and 1960s, because my grandfather (who took the first high quality underwater photographs of the Great Barrier Reef) and father (the first diving marine scientist) were essentially the only people taking them in those days, and I know almost no place that has not already lost most of its living corals. The most abundant species that most researchers now regard as "normal" are often weedy species indicating severe recent disturbance. Most of

this decline took place BEFORE any quantitative monitoring, so the results of those exercises are serious under-estimates of the decline.

Third, the species by species listing places an impossible burden on scientists to show that all of these species are vanishing almost everywhere. The areas that have been surveyed for species abundances are so small in relation to the total area of the habitat, especially compared to terrestrial habitats, that “proof” of threatened status can only be obtained long after a coral has not been found anywhere for a long time, that is to say, too late to protect them. This is an intrinsically flawed and counter-productive procedure.

Fourth, what is needed are verifiable mechanisms that permit ONLY the sale of certifiably cultured corals and bans the sale of all “wild” corals, not an indiscriminate mechanism that fails to distinguish between them. Banning the sale of sustainably-cultured corals will prevent many coral reef restoration efforts, a need that is now greater than that of conservation because we have so little left, and do nothing to stop the root causes of the major threats killing wild corals. What is needed is a process that certifies only cultured coral imports and simultaneously bans ALL WILD coral imports. Customs inspectors cannot possibly tell species apart, and many of them can only be distinguished by one or two people in the world, sometimes only with a microscope.

With regard to the specific points that NOAA/NMFS has requested guidance on, please see my comments underneath each below

(1) Historical and current distribution and abundance of these species throughout their ranges (U.S. and foreign waters);

With the sole exception of the Caribbean Acroporas, no one can honestly assess this. Most coral species, even those that are very rare, are very widespread in distribution. The rare species are seriously missed by current popular assessment methods, which intensively count corals in tiny areas, rather than examining large-scale ecological and environmental gradients. We constantly find species that are outside their “known” ranges. Therefore there is very little solid data on range changes. The only coral ever claimed to have gone extinct, one that was known only from a couple of specimens that disappeared after a bleaching event, was quickly found again once people knew how to recognize it. Last year in Jamaica I found a single colony of the only reef building Caribbean coral that we had never found there, despite 60 years of intensive diving research in Jamaica (but of course my camera's battery had failed minutes before). Current information is simply inadequate for species by species designation even while the bulk of the corals have clearly disappeared.

(2) Historic and current condition of these species and their habitat;

From the 1940s through the early 1970s we never saw diseased corals, or even unhealthy corals, unless we were in severely stressed areas, like polluted major ports in muddy river mouths, despite the fact that we were always looking for

abnormal corals to understand their physiology, genetics, and ecology. Increasingly since then many coral species are so universally diseased that in some species the disease symptoms themselves are regarded as “normal” taxonomic indicators by people who don’t know how these species used to look! Almost no study of changes in coral conditions has been long enough to be meaningful, they are just recording the tail end of their local disappearance.

(3) Population density and trends;

The enormous intrinsic variability of coral reefs makes the very small-scale transect and quadrat methods used to assess such changes nearly worthless, and much larger scale assays are needed. The data comes from intensive counts in areas that are so small that they are statistically unrepresentative and hence basically meaningless noise. One can get totally different values by placing the transect one meter away. The transect methods generally used are so weak, given the within-habitat variability (much less the between-habitat variability), that hundreds of transects would need to be made within each habitat before the mean value of the data is a statistically significant estimate of their true value, and nobody is doing sampling on a statistically meaningful scale.

(4) The effects of climate change on the distribution and condition of these coral species and other organisms in coral reef ecosystems over the short- and long-term;

Essentially ALL coral species are being severely impacted by global warming in the short and medium term, and we are seeing a wholesale shift to weedy stress-resistant species of inferior ecological value. But even those will disappear in the long term unless major stresses are controlled. For example people who talk about the “recovery” of coral reefs after bleaching seem not to be aware that the stress-sensitive species that dominated have been almost entirely replaced by stress-adapted weedy opportunist corals, which are simply the last survivors (for example Acroporas made up more than 90% of coral coverage in Palau when I filmed extensively there in 1997, ten years later after the claimed “recovery”, the reefs were overwhelmingly dominated by Porites). Porites-dominated reefs are simply an indication that everything else has already died. In many places even those have died. When the Mediterranean reefs that were the ancestors of both the Atlantic and Indo-Pacific fauna vanished, they went from around 500 coral species to one, and that was Porites, which then disappeared too.

(5) The effects of other threats including dredging, coastal development, coastal point source pollution, agricultural and land use practices, disease, predation, reef fishing, aquarium trade, physical damage from boats and anchors, marine debris, and aquatic invasive species on the distribution and abundance of these coral species over the short- and long-term; and

ALL of these factors have severe, but strictly local, impacts, and are almost irrelevant to species survival unless these local stresses were to occur in ALL parts of the corals’ ranges. These factors are of minor importance to save species, the focus must be on those factors killing corals worldwide even in

remote sites free of local stresses, specifically high temperatures and new diseases. To focus on purely local stresses amounts to cosmetic local management, not effective management at the species or ecosystem level.

(6) Management programs for conservation of these coral species, including mitigation measures related to any of the threats listed under (5) above. Management programs must reduce ALL MAJOR stresses killing corals, not just the popular local ones like diver damage, anchors, the aquarium trade, etc., and must focus on the universal coral killers, high temperatures and diseases, if they are to have meaningful impact. Politically motivated fiction about “resilience” is simply a red herring that prevents real action. Given that we have already lost most of our corals, the focus should be on protecting those few areas left in good condition, but more importantly, on large scale restoration of coral populations in historic but severely degraded reef areas that now have almost no live corals left. Most “restoration” efforts have been failures, which is why they publish claims of success immediately after transplanting corals, and never show photos of them one, three, five, or ten years later. Only the Biorock method, which increases coral growth rates 2-6 times faster (depending on species and conditions) and increases coral survival from severe bleaching events 16-50 times higher than surrounding reefs (please note that is TIMES higher, not percent), can keep reefs alive where they would die and grow back reefs in a few years in places where no natural recovery has taken place. Yet there remains no serious funding for reef restoration anywhere.

In short coral reefs need REAL protection against the factors killing them and support for effective large-scale restoration, not blind and intrinsically ineffectual bureaucratic exercises like this. I do understand that you are faithfully fulfilling the mandate you have been given; my point is not to disrespect your efforts but to point out that the mandate itself is fundamentally irrelevant because it is based on mechanical legalistic hair-splitting, and is not scientifically sound because it is not thoroughly grounded in real world biology.

Sincerely yours,

Thomas J. Goreau, PhD
President, Global Coral Reef Alliance