

Synopsis:

The document presents available data concerning the applicability of an ESA listing for the Atlantic Wolffish (*Anarhichas lupus*). As I am primarily a geneticist, I can only comment on the genetics portion of the review, the ecological/fisheries portions are best left to those with expertise in these areas.

Specific Comments:

Concerning distinct population segments, is the species delineation supported by the information presented and currently available?

Under the ESA, species are defined as “*any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature.*”

Elements to be considered include an evaluation of discreteness and, subsequently, whether or not a species or DPS is ‘significant’ to the species as a whole.

Genetic data are presented that bear on the question of discreteness and significance. These data include population-genetic variation at 14 (presumably unlinked) microsatellite markers and sequence variation at some mitochondrial DNA locus (loci?). The data presented clearly define the Western Canadian populations to be distinct from other Atlantic populations including more northern and eastern Atlantic samples. mtDNA data presumably support this demarcation, and studies on other animals show a marked tendency for phylogenetically distinct animals to support this somewhat shallow break. Data are presented that suggest a recent origin for the Western Canadian population from Eastern Atlantic stocks; evidence includes a shallow divergence between these areas and, presumably, lower genetic diversity in the former relative to the latter. This observation is mirrored across loci (and genomes).

Unfortunately, the bulk of the genetic evidence is contained, almost wholly, within an unpublished study of genetic divergence within wolffish populations throughout the known range of the species. Some questions therefore arise over the strength of these data, including appropriate sampling (sample size within populations and populations within the species), linkage arrangements among loci, a lack of (the document is not clear on this point) individuals (or a large number) sampled from the US western Atlantic population, allelic diversity (although the document suggests lower diversity in some populations), a specific partitioning of the genetic diversity within/among populations (percentages would be helpful), the issue of multiple comparisons and statistical correction, etc. Reliance on unpublished genetic data that are crucial in defining ‘distinctiveness’, and a suggestion that the western Atlantic populations have only recently been founded, suggest a real need

for detail so that the reader can be confident of the conclusions drawn. That said, if the reader takes the genetic data at face value, then the genetic support for distinctiveness is rather strong.

In general, does the status review report include and cite the best scientific and commercial information available on the species and threats to it and to its habitat?

I am not aware of any issues related to habitat requirements, etc., not outlined in the document. However, Cunningham (Duke) and students have published a fair bit of genetic data on a variety of different animals suggesting recent colonization of the western Atlantic from eastern Atlantic progenitors. These data strongly support the supposition that western Atlantic populations of relatively widespread animals were founded recently from the eastern Atlantic, but that these populations are largely discrete.

In general, are the scientific conclusions sound and derived logically from the results?

The scientific conclusions are somewhat sound, but again the genetic data might rely too heavily on unpublished data that have not been peer-reviewed.

Where available, are opposing scientific studies or theories acknowledged and discussed?

My impression is that opposing scientific studies are very few in number, and therefore adequately addressed.