Tool profile

Name of tool/app: Freshwater mapping application (FWMA)

URL to access app/tool: http://mappingfw.iucnredlist.org/FWMA/

Author/creator: Developed by RMSI in collaboration with IUCN Red List Unit and IUCN Freshwater Biodiversity Unit

Support network: RMSI, IUCN Red List Unit and IUCN Freshwater Biodiversity Unit

Associated research publication(s): None

Help file: https://nc.iucnredlist.org/redlist/resources/files/1575544453-IUCN_FWMA_Help_Manual_2.1.pdf

Programming language: Online application

Access rights: Requires access to IUCN SIS – individuals need "assessor rights" to the working set they want to create maps for.

Brief summary: The Freshwater Mapping Application (FWMA) is a web based mapping application that can be used to produce distribution maps of freshwater species as part of assessments for The IUCN Red List of Threatened Species™ . The FWMA provides an online platform to produce new distribution maps or update existing distribution maps for species with published IUCN Red List assessments. Users can upload external observation data (in the form of point, line or polygon data), which can be used to guide mapping. The application uses standardized base layers and follows the standard IUCN methods for mapping freshwater species, for calculating metrics such as extent of occurrence (EOO) and area of occupancy (AOO), and for listing countries of occurrence (COO). The application can be used to create maps anywhere with reasonable internet bandwidth. The maps can also be reviewed online and either approved or rejected, which greatly improves the efficiency of the assessment review process. The FWMA is integrated with the existing IUCN Species Information Service (SIS) database, where data for IUCN Red List assessments are stored and managed. Users must, therefore, first have access to SIS to use the FWMA. The FWMA then allows users to edit the maps of species they have permission to edit in SIS.

Relevant Red List parameters: EOO, AOO

Input data format: HydroBASIN (https://www.hydrosheds.org/page/hydrobasins) maps made in the FWMA itself

Batch processing: No

Internet access required: Yes

Technical knowledge required: Basic

Computing requirements: Reasonable internet bandwidth

Stability: Redeveloped in 2018/2019

Testing notes

The FWMA is primarily a tool for producing distribution maps for freshwater species for the IUCN Red List, rather than for calculating EOO and AOO, although it does have functionality for the latter. Before calculating EOO and AOO, a distribution map (based on HydroBASINS) has to be created in the tool.

As a result, it was not possible to test species without HydroBASIN distribution maps (e.g. plants, birds, inverts). Additionally, it was not possible to test species with a mixture of HydroBASIN and polygon distribution maps (e.g. species with freshwater and marine distributions) because the marine part of the range could not be accurately recreated in the FWMA. The FWMA does have a tool for mapping marine range but is based on a buffer of x km from the coast, rather than bathymetry which is used for many Red List marine maps.

I had to recreate all HydroBASIN distribution maps in the FWMA before testing. For widespread species, there are likely to have been some errors in my recreation of the maps. There is a function in the FWMA to upload observation data (points, polylines, polygons) and intersect and select HydroBASINS with these uploaded data, but this is an intersect function and so selects a wider range than uploaded. This will result in minor errors in the actual EOO/AOO values.

Both EOO and AOO are calculated based on the HydroBASIN maps. EOO is therefore a MCP around all HydroBASINS (with relevant POS coding). AOO is the area of all 2 x 2 km grid cells intersecting all HydroBASINS (with relevant POS coding).

AOO functionality on the FWMA does not work for species with large distribution areas. The tool times out before it is calculated.