

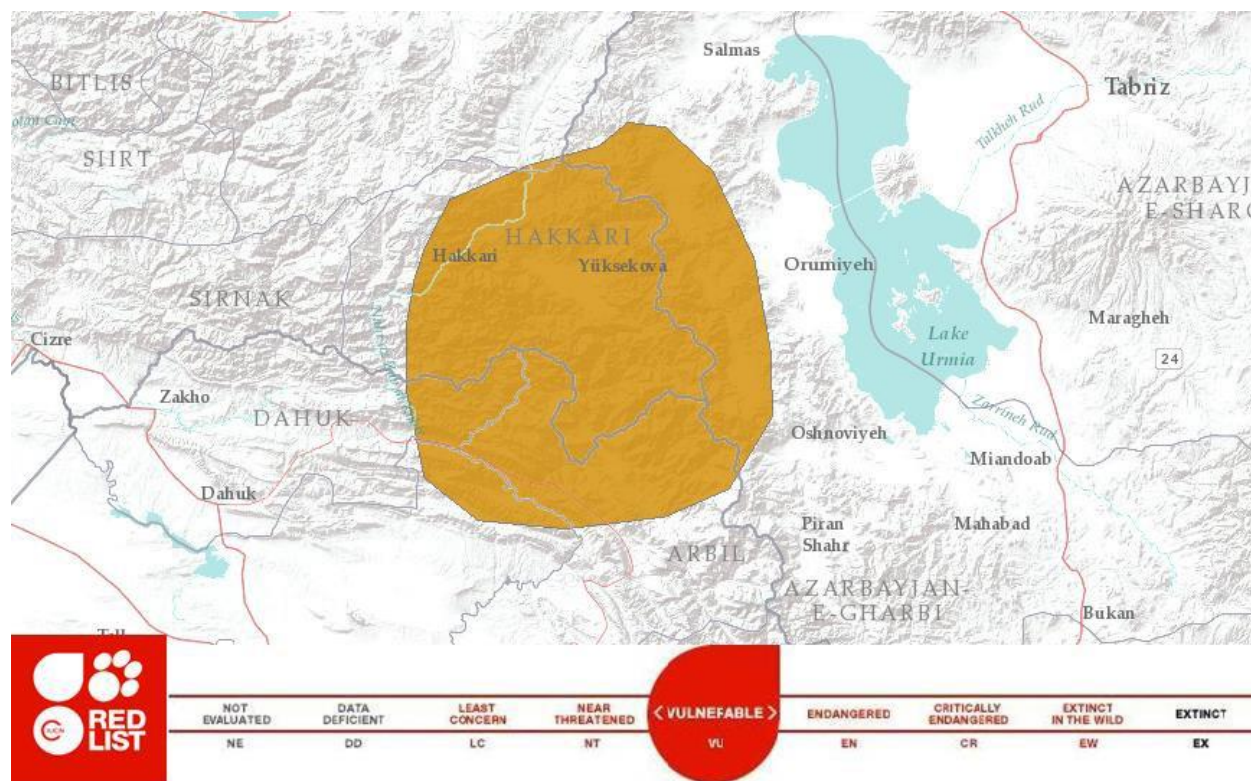
Project Update: November 2017

Project Purposes:

The main goal of this project is the ecological study and conservation of Lake Urmia Newt, *Neurergus crocatus* Cope, 1862 in Iran.



A general view of *Neurergus crocatus* habitat

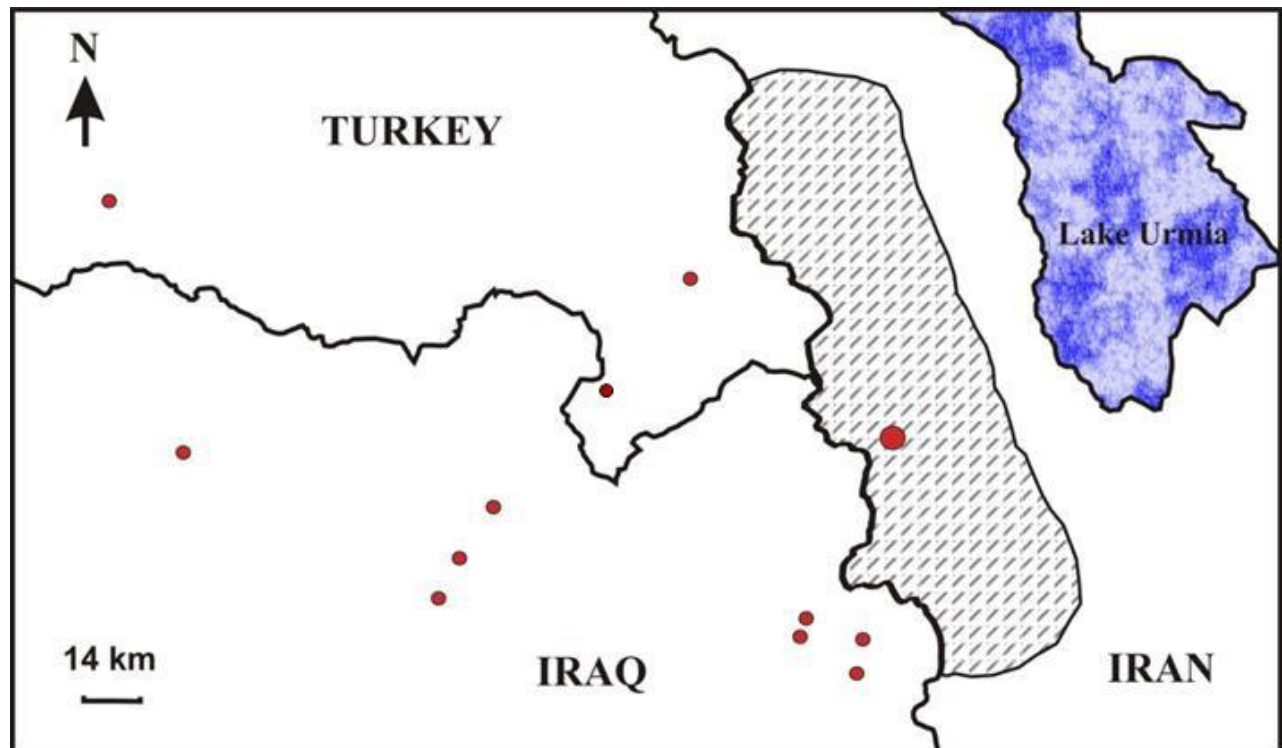


Status and distribution map of *Neurergus crocatus* according IUCN Redlist

The project has aimed to carry out two objectives: scientific research and programmes for public awareness. Therefore to help Lake Urmia newt survival, we planned to investigate the presence of populations of *N. crocatus* in the area, collect data of their morphology and life cycle, determine the current distribution range, estimate population density/size, investigate the specific ecological niche requirements and habitat preferences of *N. crocatus*, determine the possible threats to formulate appropriate management and conservation strategies, and raising awareness of local communities by educational programmes, school presentations and published materials.

Completed Work:

We have completed field surveys across the potential range of *N. crocatus* at the mountains located at the west of Lake Urmia near Turkey and Iraq borders (more than 4500 km²) in West Azerbaijan province, Iran. Field surveys started at spring as snow started melting in mountains and highlands, and were carried out by walking around water bodies and brook sides during the day to detect adult animals visually, or look for spawn or juveniles in the water bodies or under the rocks.



The hatched part shows our surveyed area and red points are known localities

The following data was collected:

1. The geographical position of the localities was recorded by GPS; that will be used for modeling the geographic distribution and suitable habitat range of the species.
2. Habitat and microhabitat variables were collected as ecological data from all visited habitats (characteristics of aquatic and terrestrial habitat).



Left: Field surveys to find the species and gathering data

3. Water quality analysis data: water samples were collected from the point where each newt was found and analysed for its physicochemical characteristics. Temperature, dissolved oxygen, pH, salinity and conductivity were measured by Hach Portable “pH/conductivity/dissolved oxygen meter” in the field and some chemical characteristics such as iron, manganese, potassium, chloride, sulphate, phosphate, nitrate, ammonia and hardness (magnesium and calcium) were measured in the laboratory using a Hach Lange “DR 2800 VIS Spectrophotometer”, following the manufacturer's procedures.



Measuring temperature, Dissolved Oxygen, pH, Salinity and Conductivity in the field



Analyzing water samples for some chemical characteristics at Ege University Conservation laboratory



Different stages of life cycle of *Neurergus crocatus*; eggs, Larvae and adults

4. Estimation of population size/density;

Populations monitoring was designed with the assumption that the population is closed.

Visually encounter surveys (VES) around breeding sites was conducted by walking through the area or habitat for a prescribed time period. During field surveys, all captured newt were photographed dorsally from the constant distance to document its colour pattern as an individual recognition mark. Total body length and snout-vent length (SVL) of each newt was recorded, as well. We estimated population size by capture-mark-recapture (CMR) method consisting of the capture and marking of individuals by taking digital image, release, and their subsequent recapture or re-sighting one or more times. We will use CMR estimator, Peterson and MARK to estimate population size.



Monitoring studies of the newt populations to estimate population size/density



Measuring the samples and taking dorsal photo to document the color pattern

Possible Threats:

The most notable threat to this species is habitat loss due to the divergence of the stream for irrigation of cultivated lands, drainage and water conduit for local people communities, pollution, road construction works, drought and flood. When all these threats combined might lead to the decline and extinction of these species populations throughout its distribution range. Killing newts by the thought that they are poisonous and plucking vegetation inside the spring where animals lay eggs on them in the water sources used by locals can be considered as an observed threat.



Habitat destruction by flood



Predators, hunting by crabs



Drainage and water conduit of springs for local people communities

For public awareness;

1. Several sessions have been held in the Department of Environment of West Azerbaijan Province and Oshnaviyeh in order to draw their attention to participate in this conservation project and to do necessary actions and coordination with the Ministry of Education of the area for school presentations.
2. Several sessions have been held in public places in the villages or in the picnic area to introduce the harmless species to the people and describing the importance of conservation of the bio-indicator species that just live in the area.
3. Face to face education and talking with local communities using water bodies and springs for tapping and drinking or gathering medicinal plants and herbs at proper seasons to explain them about the harmless nature of these threatened animals.



Face to face education to people who visit the site for gathering medical plants and herbs

Ongoing and future works:

Scientific studies and public awareness activities are carrying on in the area.

1. Preparing species distribution modelling and suitable habitat range using present geographical position of recorded localities and modelling programmes.
2. Giving presentations in schools (focus on raising children's knowledge of the newt species), governmental and non-governmental organisations related to conservation and protection in adjacent villages and cities and delivering information cards, info graphs and postal cards along with descriptions on them, in stations and by patrolling in crowded patches and picnic places, in weekends during proper seasons.
3. Installing posters in public places across neighboring cities of the distribution area.
4. Designing and printing educational brochures about species for raising awareness of villagers and travelers who visit the area in proper seasons. The brochures will have general information about the species.
5. Designing and providing cloth bags and distributing them among students.