



MAKING A DISTRIBUTION MAP OF THE SPECIES INCLUDED IN THE RED BOOK IN THE NUROTA NATURE RESERVE ACCORDING TO THE DEGREE OF RARITY USING THE GeoCAT METHOD

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A B S T R A C T	K E Y W O R D S
<p>In the article, the status of each species according to the international red book, i.e. IUCN, of the plants included in the red book distributed in the Nurota State Reserve, was given, and the GeoCAT method was used directly. We converted the data of each species into a CSV file, as a result, the EOO of each species, i.e., the area where the species is spread, and the AOO, the areas where the species can spread, were determined. The research results show that every plant kept wild should be protected from anthropogenic influence and special protection measures should be developed.</p>	<p>red book, IUCN, plants, Nurota State Reserve, GeoCAT, result, area, spread, determined, research, kept, anthropogenic influence, special protection, developed.</p>

INTRODUCTION

Decision PQ-4670 dated 10.04.20 of the President of the Republic of Uzbekistan Sh.M. Mirziyoyev "On measures for the protection of medicinal plants growing in the wild, cultural cultivation, processing and rational use of available resources" acceptance also increases the relevance of the topic. This decision is the main urgent problem of the topic of regulating all the opportunities for the protection of valuable wild-growing medicinal plants of our republic and the development of knowledge, traditions of folk medicine, science, and pharmaceuticals related to their rational and efficient use. [1]

The flora of Central Asia, as first noted by A.N. Krasnov (1888), is ortho-selective (this term is later, but this is the essence of A.N. Krasnov's statements), that is, by reworking the tertiary Palearctic flora into the modern flora under the influence of A.N. progressive climate dryness. [2, p. 154, 3]

Information about the flora of the Nurota state reserve is provided in the manual "cadastral flora of the Dzhizak region of Uzbekistan (sosudistiye rasteniya)" prepared by Tojibayev K.Sh., Beshko N.Y., Esankulov A.S., Batoshov A.R., Azimova D.E (2021). The Nurota state reserve is located in the

central part of the Nurota Ridge and its total area is 17,752 hectares. 78 families and 838 species belonging to 376 genera were listed for the region's flora in the studies conducted in the Nurota State Reserve. It was found that 78 families, 33 species belonging to 376 genera were included in the Red Book of the Republic of Uzbekistan. [4] [5]

International Union for Conservation of Nature - TMXI (English "International Union for Conservation of Nature" - IUCN) forms a list of biological species in need of protection in different regions of the Earth, provides information about them, preserves biological diversity on our planet and is an international non-profit organization dealing with problems. [6]

NE – not evaluated

DD – data deficient

LC – least concern

NT – near threatened

VU – Vulnerable

EN – endangered (on the verge of extinction)

CR - critically endangered (on the verge of extinction)

EW – extinct in the wild

EX – extinct.

Research methodology. [6]

GeoCAT (Geospatial Conservation Assessment Tool) is an open-source, browser-based tool that performs rapid geospatial analysis for Red List assessment. The analysis developed to use spatially referenced primary occurrence data focuses on two aspects of a taxon's geographic range: the extent of occurrence (EOO) and area of occupancy (AOO). These indicators form part of the IUCN Red List categories and criteria and have often proven difficult to obtain precisely, consistently, and reproducibly. [7]

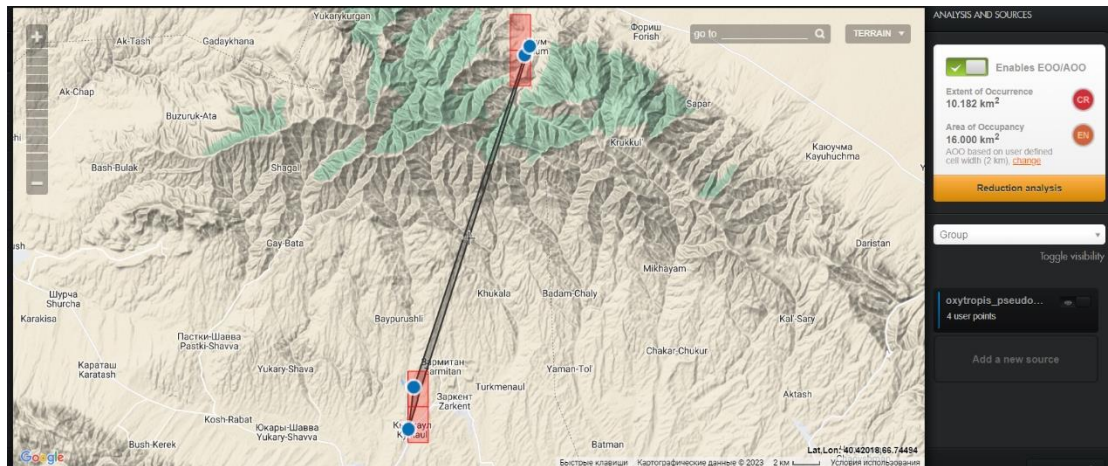
As a result of our field research of the species included in the red book of the reserve and the collection of samples from large herbarium funds, we determined the growing points, and the status of the species in the international IUCN red book was clarified, this process was carried out directly using the GeoCAT program. We converted the data of each species into a CSV file, as a result, the EOO of each species, i.e., the area where the species is spread, and the AOO, the areas where the species can spread, were determined.

Results and their analysis.

1. *Oxytropis_pseudorosea*. Film. (Nim Pink *Oxytropis*)

An endemic species of the Nurota Mountains. [5] [8]

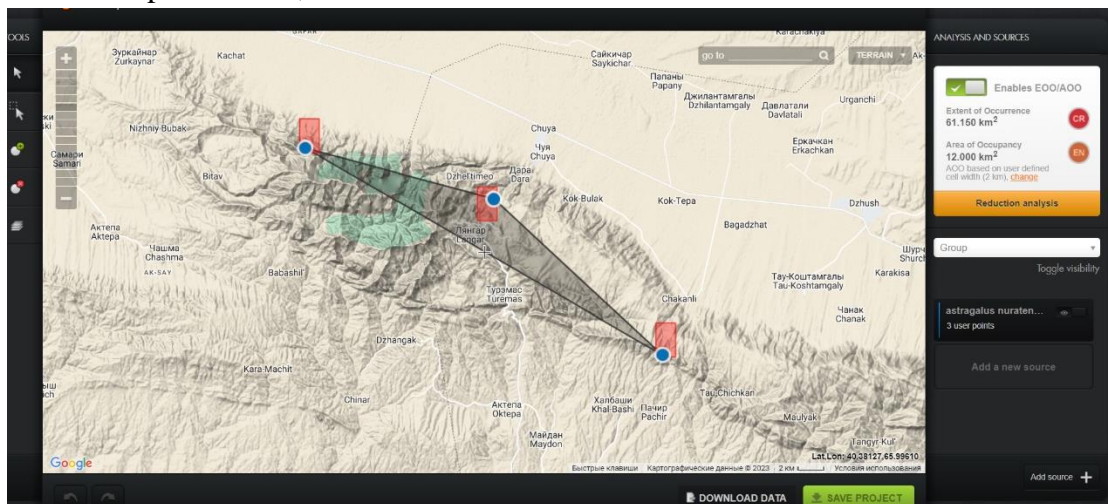
The EOO of this type is 10,182 km² and the AOO is 16,00km²



2. *Astragalus nuratensis*. Popov (Nurota astragali).

A rare endemic species of the Nurota Range. [5] [8]

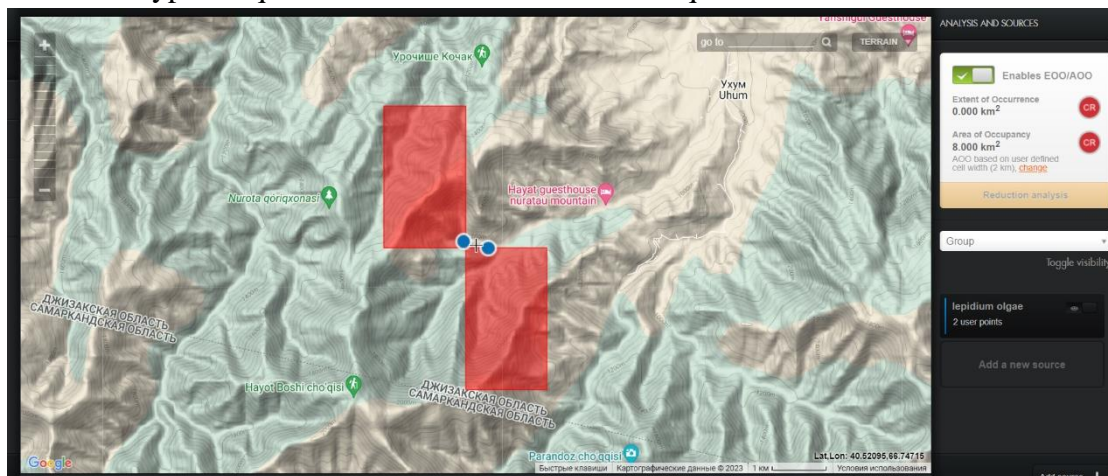
The EOO of this species is 61,150 km² and the AOO is 12 km².



3. *Lepidium olgae* R.M. Vinogr. (Olga lepidium).

A rare endemic species of the Nurota Range. [5] [8]

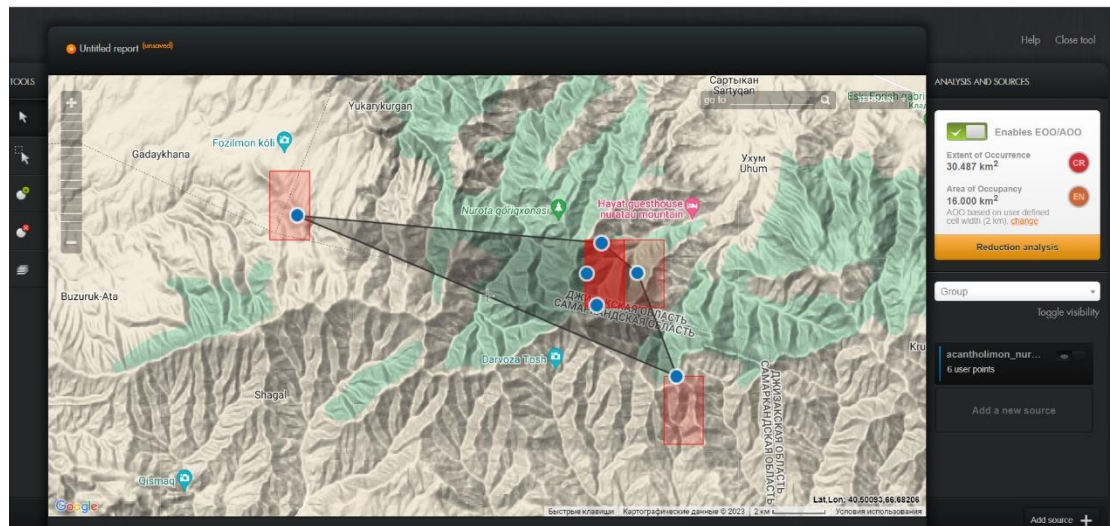
The EOO of this type is equal to 0.0 km² and the AOO is equal to 8 km².



4. *Acantholimon nuratavicum*. Zakirov. (Nurota hedgehog).

A rare endemic species of the Nurota Range. [5] [8]

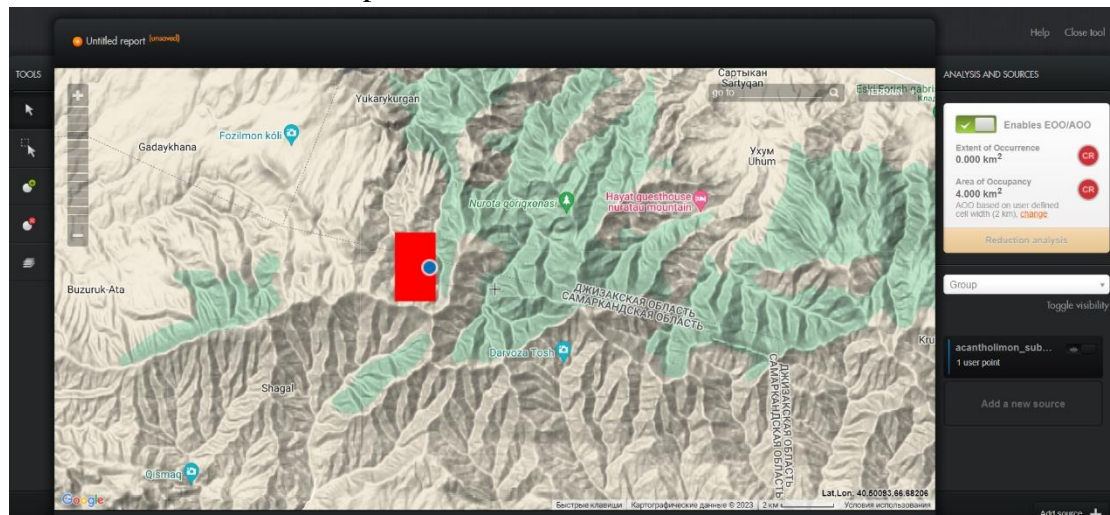
The EOO of this type is 30,487 km² and the AOO is 16.00 km².



5. *Acantholimon_subavenaceum*. Lincz. (Almost oat-like hedgehog).

A rare endemic species in the Nurota Range. [5] [8]

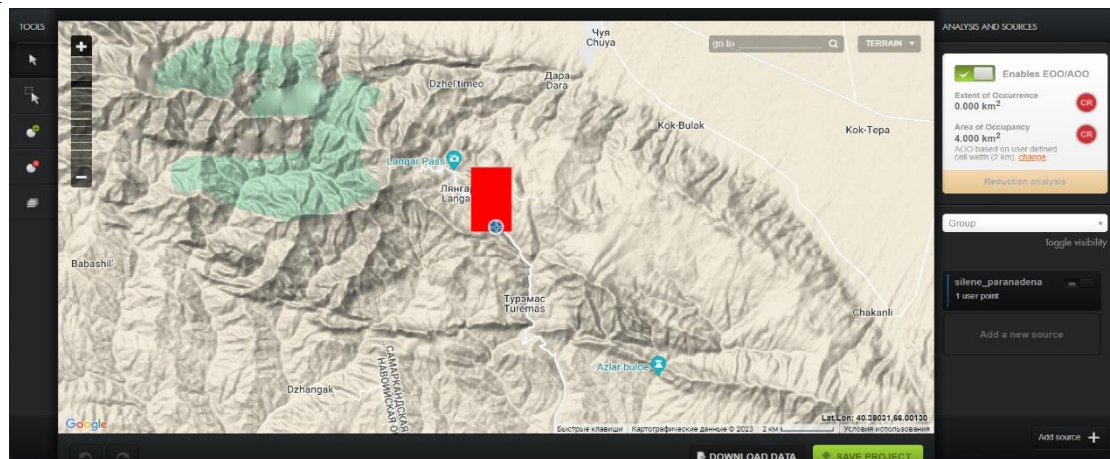
It was found that the EOO of this species is 0.0 km² and the AOO is 4 km².



6. *Silene_paranadena*. Bondarenko et vved.

This species is a rare endemic species in the northwestern Pamir-Aloy. [5] [8]

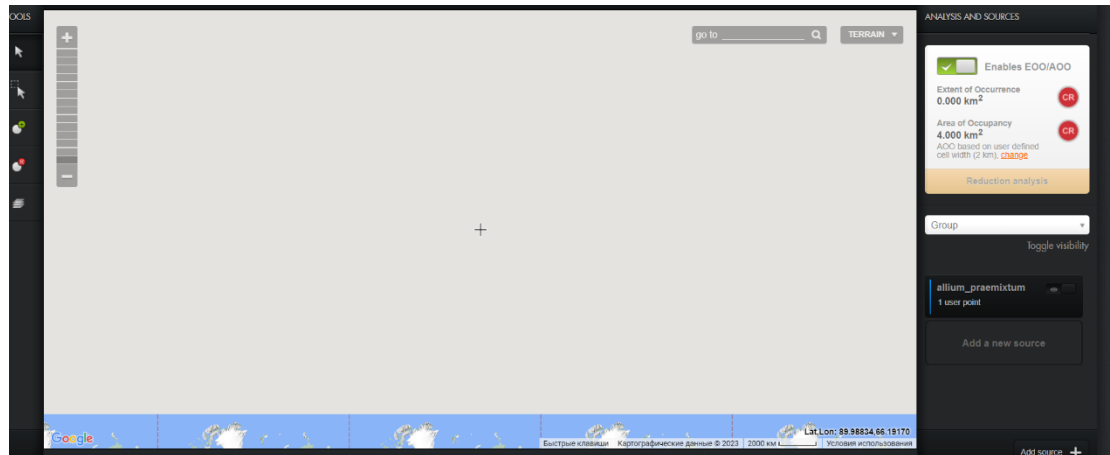
This species has an EOO of 0.0 km² and an AOO of 4 km².



7. *Allium_praemixtum*. Vved. (Mixed onion).

This species is a scarce endemic plant of Nurota and the southwestern part of Western Tien Shan. [5] [8]

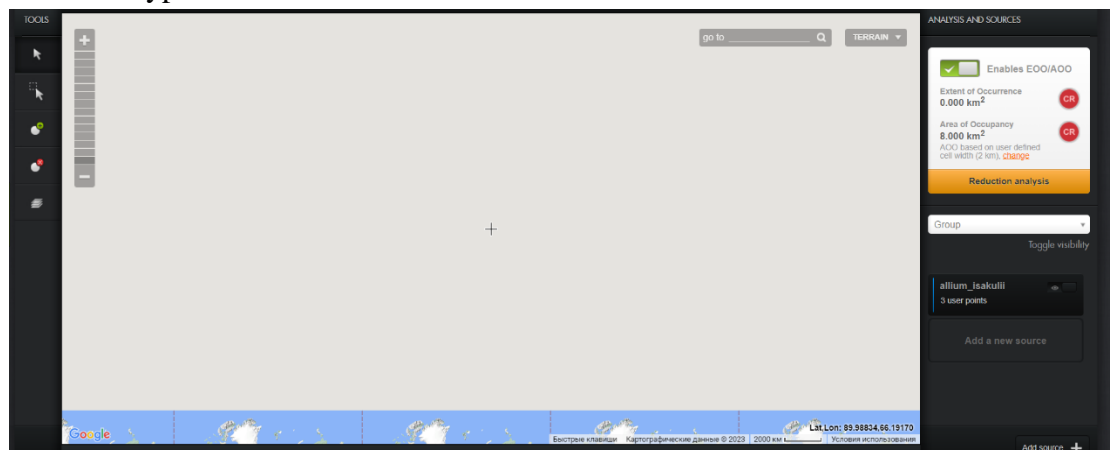
The EOO of this type is 0.0 km² and the AOO is 4 km².



8. *Allium_isakulii*.R.M.Fritsch et F.O.Khass.(Isakul onion)

A rare endemic plant in the Western Tien-Shan and Pamir-Aloy. [5] [8]

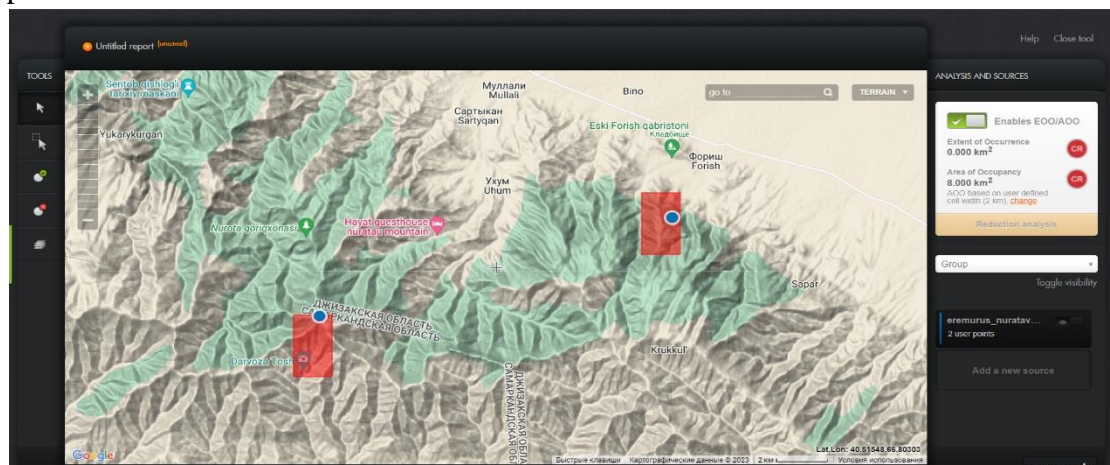
The EOO of this type is 0.0 km² and the AOO is 8 km².



9. *Eremurus_nuratavicus*.A.P, Khokhr. (Nurata shirachi).

A rare endemic plant in the Nurota Range. [5] [8]

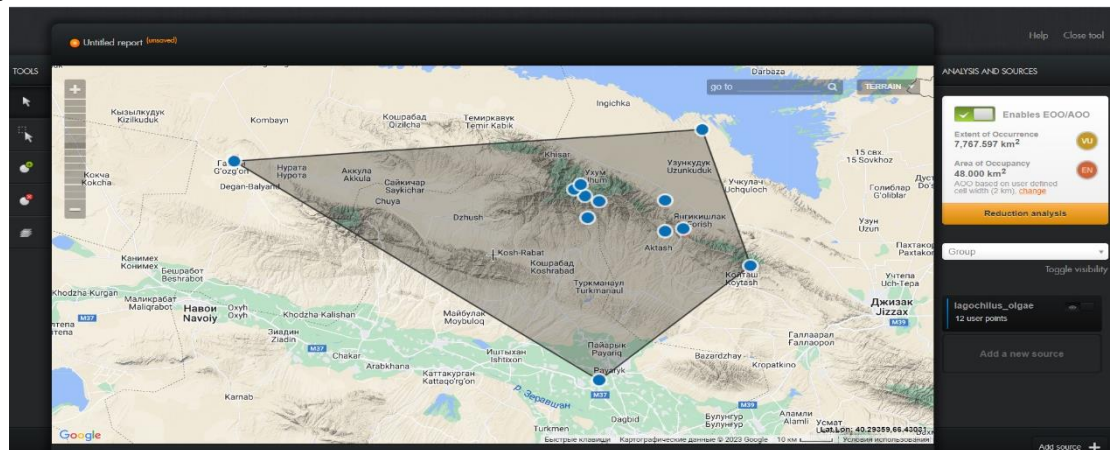
This type has an EOO of 0.0 km² and an AOO of 8.0 km²



10. *Lagochilus_olgae*.Camelin.(Do not disturb).

This species is a rare endemic plant of the Nurota ridge. [5] [8]

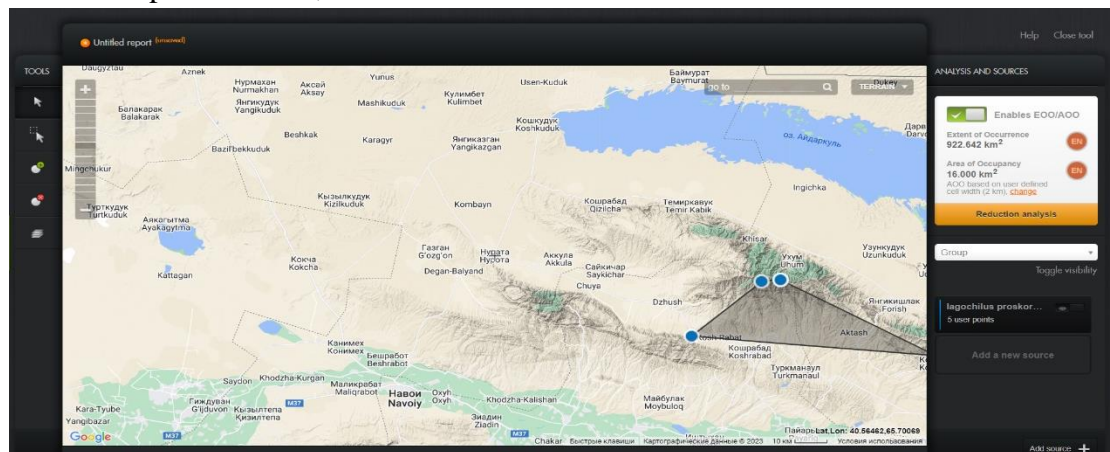
This species has an EOO of 7,767 km² and an AOO of 48 km²



11. Lagochilus proskorjakovii. Ikramov

An extremely rare endemic species for the Nurota ridge. [5] [8]

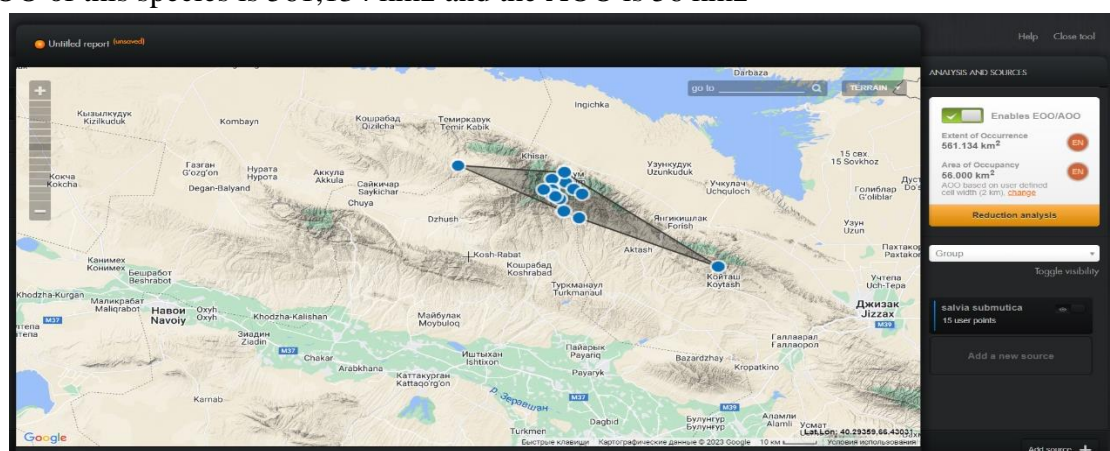
The EOO of this species is 922,642 km² and the AOO is 16 km².



12. Salvia submutica.Botsch.(Salvia submutica).

A rare relic, an endemic plant in the Nurota ridge. [5] [8]

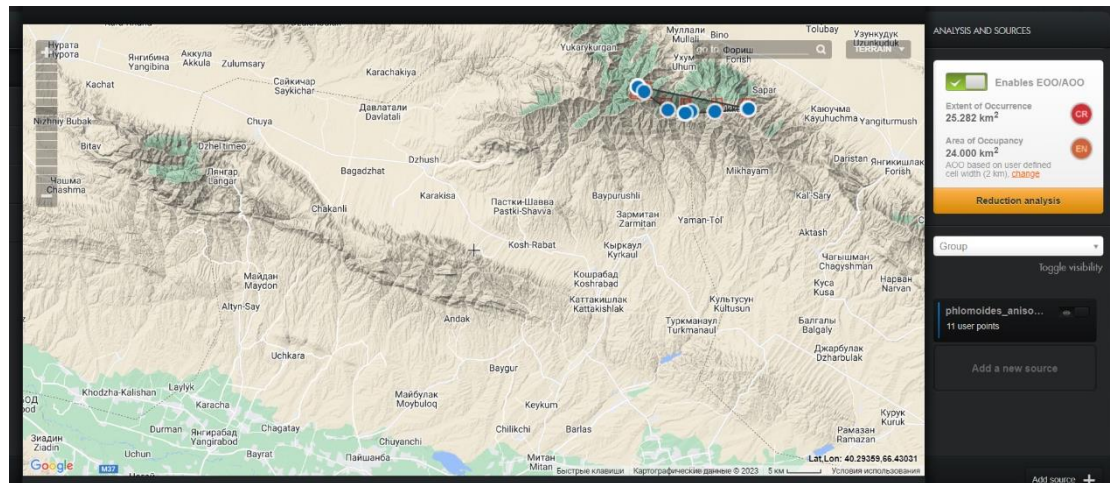
The EOO of this species is 561,134 km² and the AOO is 56 km²



13. Phlomodoides_anisochila.Camelin.

This species is an extremely rare endemic plant in the Nurota range. [5] [8]

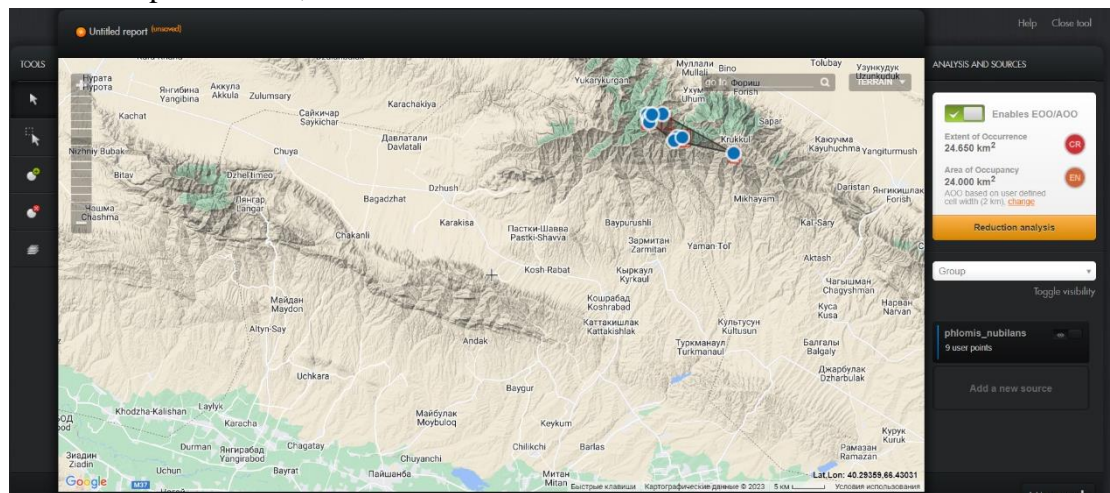
This species has an EOO of 25,282 km² and an AOO of 24 km².



14. *Phlomis_nubilans*. Zakirov.

This species is a rare endemic plant in the Nurota Range. [5] [8]

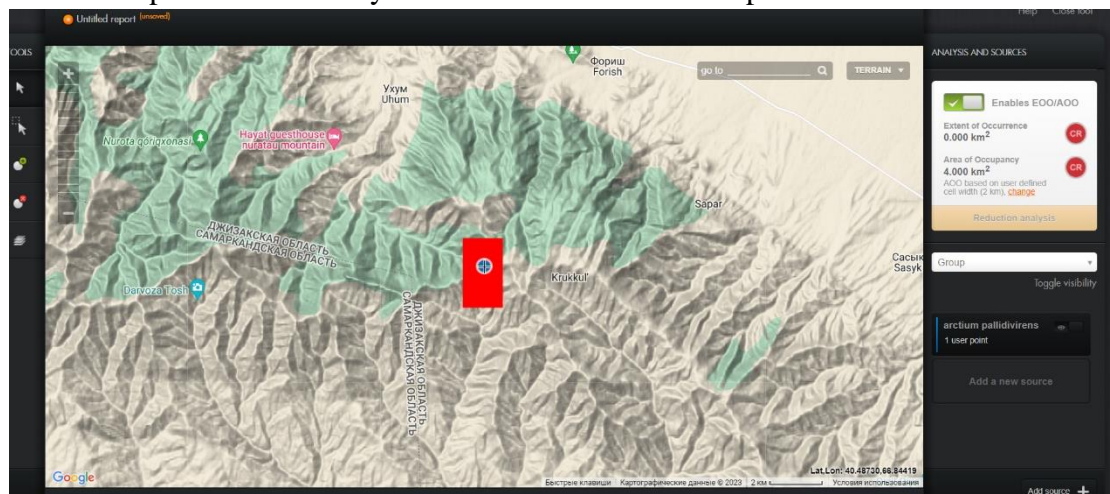
The EOO of this species is 24,650 km² and the AOO is 24.km²



15. *Arctium pallidivirens*. Cult. Tscherneva. (Green anura).

It is a rare endemic plant growing in the Nurota mountains. [5] [8]

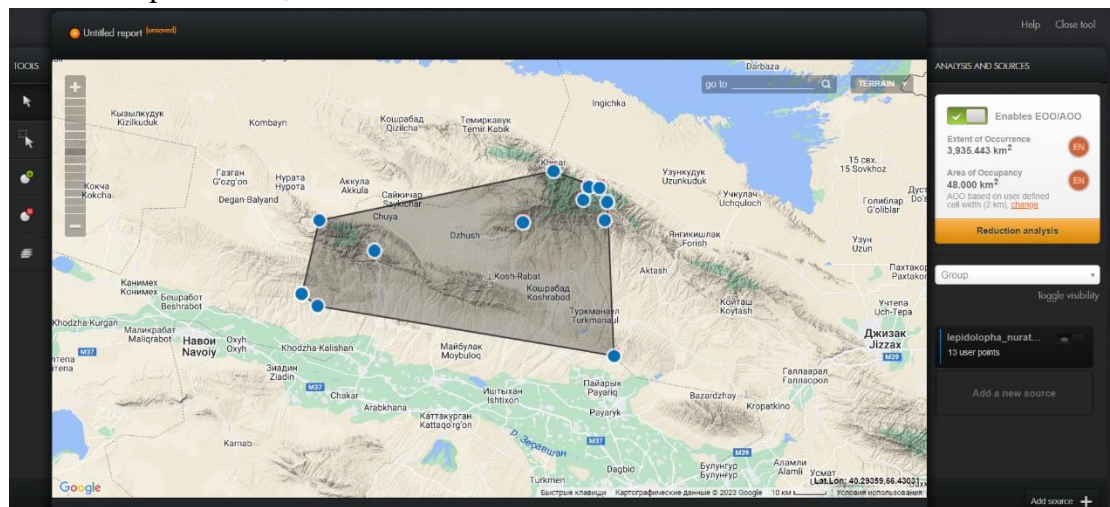
The EOO of this species covers only 0.0 km² and the AOO occupies an area of 4 km².



16. *Lepidolopha_nurata*.Krasch.(*Lepidolopha* of Nurota).

This species is a rare endemic plant with a divided area typical of Western Pamir-Oloy. [5] [8]

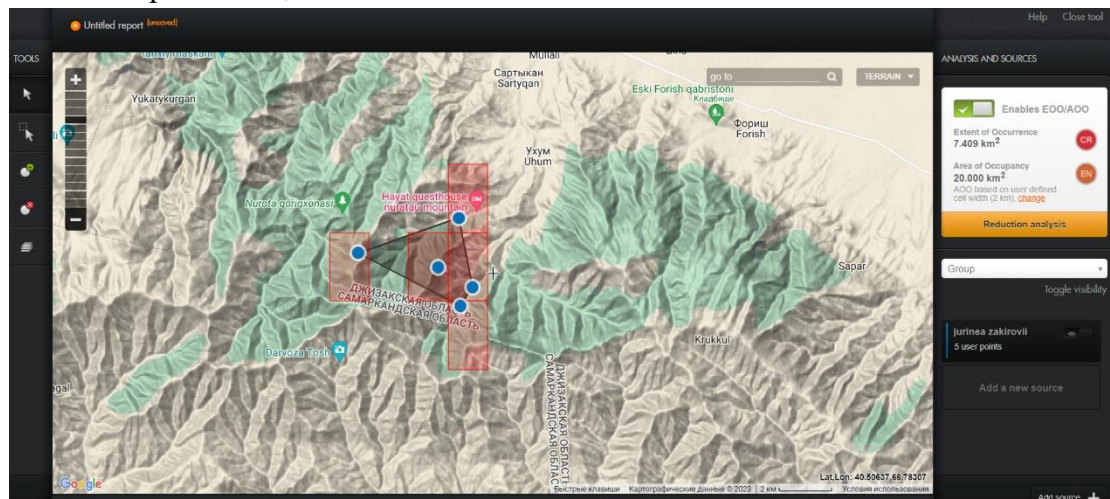
The EOO of this species is 3,935 km² and the AOO is 48 km².



17. *Jurinea zakirovii*. Iljin.

A scarce endemic plant distributed in the Nurota mountains. [5] [8]

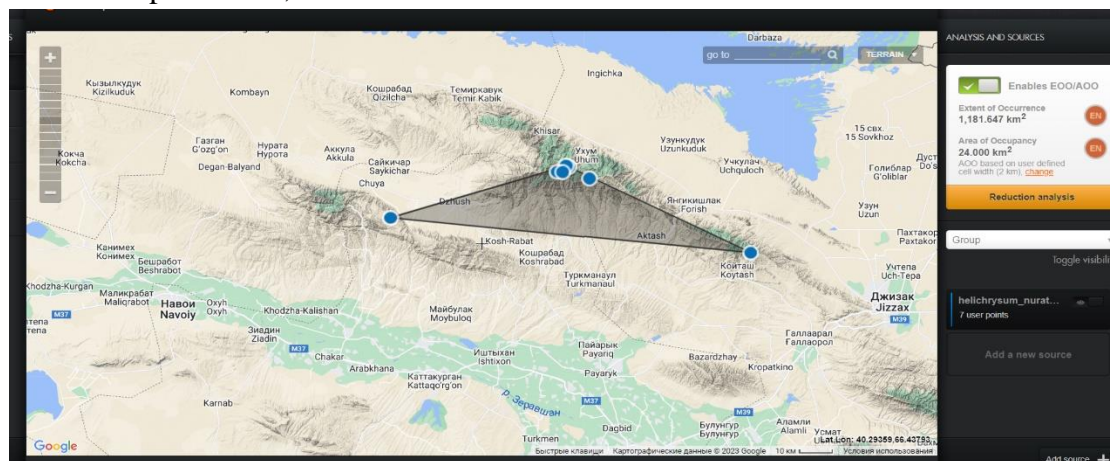
The EOO of this species is 7,409 km² and the AOO is 20 km².



18. *Helichrysum_nuratavicum*. Krasch. (Nurota Immortal Herb).

A rare endemic species growing in the Nurota mountains. [5] [8]

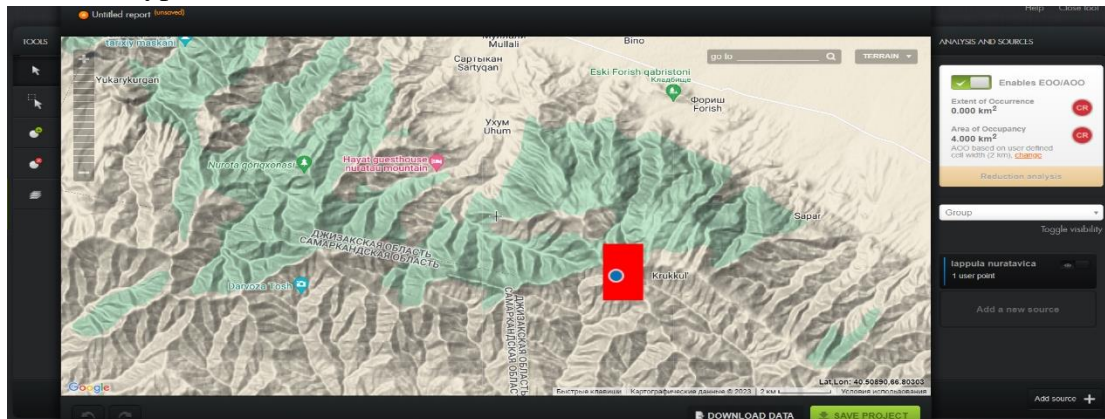
The EOO of this species is 1,181 km² and the AOO is 24 km².



19. *Lappula nuratafica*. Nabiev et Zakirov. (Nurota blue flower).

A rare endemic plant found in the Nurota mountains. [5] [8]

The EOO of this type is 0.0 km² and the AOO is 4 km²



Conclusion

The results of this study show that all the species included in the Red Book of Nurota State Reserve are endemic plants for the reserve, that is, they are not found in other areas. All of them have the status of IUCN.

EN – endangered (on the verge of extinction)

CR - critically endangered (on the verge of extinction)

In conclusion, it can be said that to preserve each endemic species, it is necessary to take special protective measures, in addition, measures should be taken to protect the flora of the reserve from negative anthropogenic effects.

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