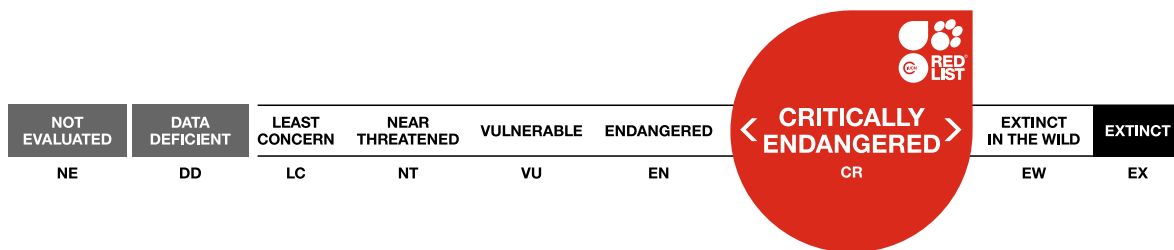




## *Thymallus aeliani*, Adriatic grayling

Assessment by: Duchi, A., Puzzi, C. & Volta, P.



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## Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Actinopterygii	Salmoniformes	Salmonidae

**Scientific Name:** *Thymallus aeliani* Valenciennes, 1848

### Common Name(s):

- English: Adriatic grayling

### Taxonomic Source(s):

Fricke, R., Eschmeyer, W.N. and Van der Laan, R. (eds). 2019. Eschmeyer's Catalog of Fishes: genera, species, references. Updated 04 February 2019. Available at: <http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>. (Accessed: 04 February 2019).

## Assessment Information

**Red List Category & Criteria:** Critically Endangered B2ab(iii,iv,v) [ver 3.1](#)

**Year Published:** 2020

**Date Assessed:** September 19, 2019

### Justification:

Once widespread, *Thymallus aeliani* has undergone a 99% decline in its population during the 20th century. Now it only occurs in two isolated subpopulations, for one of which the viability is not ensured. The Seria River subpopulation is now slowly increasing thanks to conservation efforts, which have been critical in order to avoid a further decline in the population. However, the Po/Pellice subpopulation is still undergoing a continuing decline in its quality of habitat due to the same threats that have affected the Seria River subpopulations and have also affected the entirety of the population so far. Given its small area of occupancy (AOO = 8 km<sup>2</sup>), only two known locations, and a continuing decline in the quality of habitat, this species is assessed as Critically Endangered. Climate change driven habitat changes and heat waves pose an additional threat and this species is at a very high risk of extinction. Major engagements of conservation in the region are recommended to build up additional subpopulations and restore habitats to safeguard this species, in a way having been proven to be successful in *Salmo marmoratus* in the same region.

## Geographic Range

### Range Description:

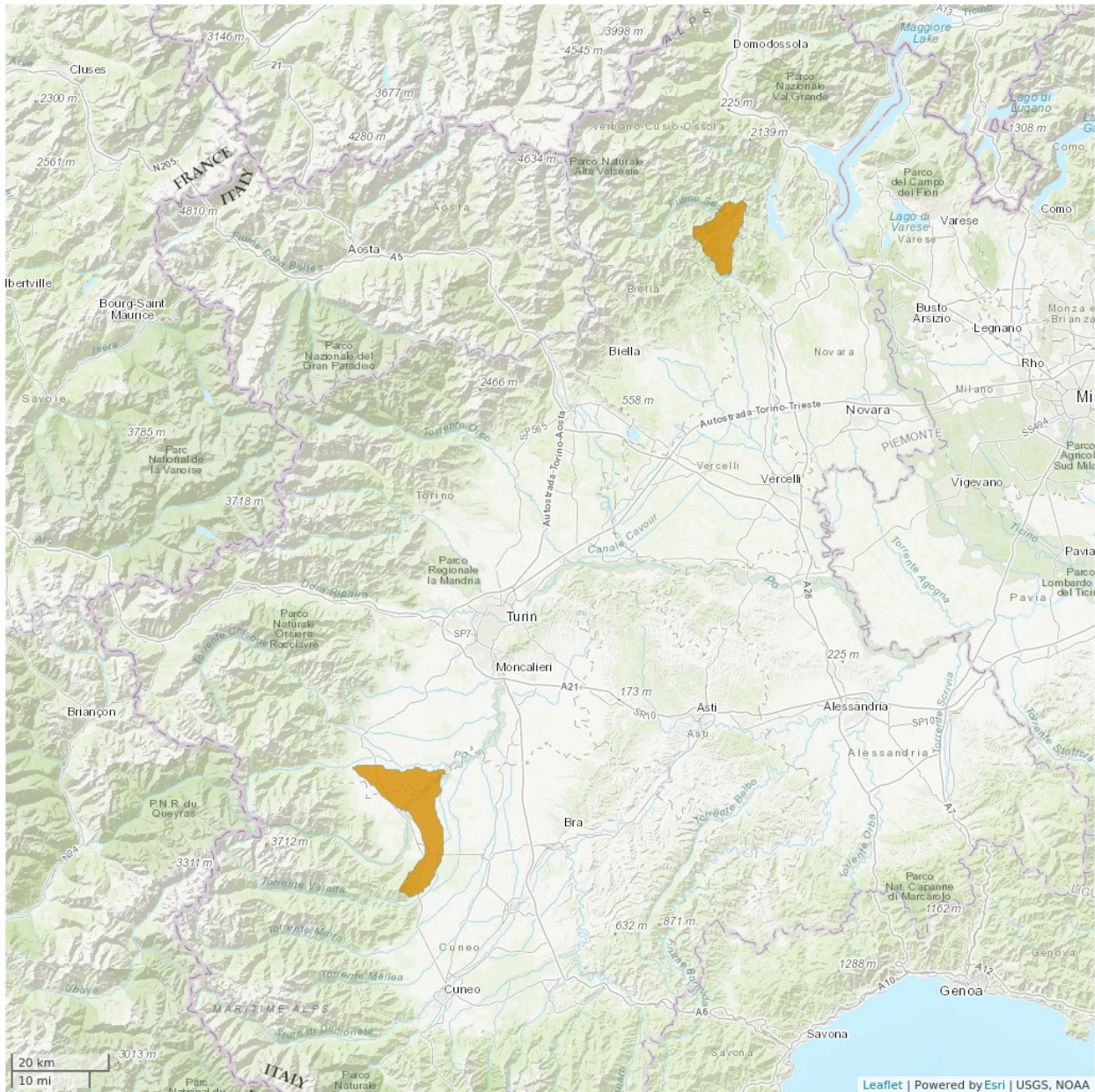
The historic distribution area is the Po River drainage in the left-hand tributaries, as well as some tributaries of the northern Adriatic Sea (Bajic *et al.* 2018). It has vanished from almost the complete former distribution area following many threats in the 20th Century and might have lost more than 99% of its historic range. Two extremely small subpopulations of genetically pure fishes are left: one in the Sesia River, and a second, even smaller in the very upper River Po and lower River Pellice. Both sites

together are no more than 4 km in length each.

**Country Occurrence:**

**Native, Extant (resident):** Italy (Italy (mainland))

# Distribution Map

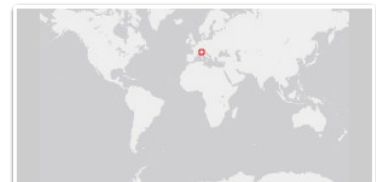
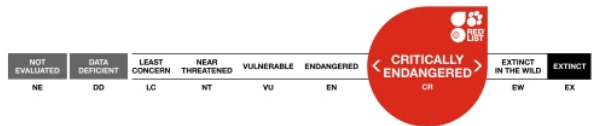


## Legend

■ EXTANT (RESIDENT)

Compiled by:

IUCN (International Union for Conservation of Nature) 2019



The boundaries and names shown and the designations used on this map do not imply any official endorsement, acceptance or opinion by IUCN.



## Population

This species was very widespread in the north Adriatic Rivers and has experienced a massive decline in the 20th century due to many threats. It has vanished from almost the complete former distribution area following many threats in the 20th Century and might have lost more than 99% of its historic range. Two extremely small subpopulations of genetically pure fishes remain and are supported by stocking and conservation activities. The Sesia subpopulation is slowly recovering in numbers, while the Po/Pellice subpopulation might not be viable due to low number of mature individuals and strong threats still present in the area. It is believed that the Po/Pellice population is decreasing and is fully conservation dependent. The overall population trend is believed to be decreasing due to the decline in the Po/Pellice population which is already or might soon be fully dependent on stocking. Therefore, despite these activities, the species remains at a high risk of extinction. The two subpopulations are isolated and fragmentation is considered to be a threat, as genetic inbreeding in the two stocks might be an issue.

**Current Population Trend:** Decreasing

## Habitat and Ecology (see Appendix for additional information)

This species occurs in cold, fast-flowing mountain rivers in the grayling zone with gravel substrate.

**Systems:** Freshwater (=Inland waters)

## Use and Trade (see Appendix for additional information)

This was an attractive species for recreational fisheries, but is not used.

## Threats (see Appendix for additional information)

The introduction of alien *Thymallus thymallus* is and was the major threat to this species, as both graylings hybridise resulting in many native grayling subpopulations being polluted or lost. Dams and predation of the last few fishes by cormorants are also serious threats. Climate change driven habitat changes and heat waves are expected to be a serious threat in the future.

## Conservation Actions (see Appendix for additional information)

Reintroduction based on genetic study, exclusion of predators (cormorants), river defragmentation with fish passages, and respect of ecological flows are the main successful conservation actions that took place in the Sesia river, which helped this subpopulation to regain its viability. These actions should be taken also in the Po subpopulation in order to save this species from a probable local extinction.

## Credits

**Assessor(s):** Duchi, A., Puzzi, C. & Volta, P.

**Reviewer(s):** Carosi, A., Lorenzoni, M. & Freyhof, J.

**Facilitator(s) and Compiler(s):** Angelico, M., Holenstein, K. & Lumbierres, M.

**Authority/Authorities:** IUCN SSC Salmon Specialist Group



## Bibliography

Bajić, A., Jojić, V., Snoj, A., Miljanović, B., Askeyev, O., Askeyev, I. and Marić, S. 2018. Comparative body shape variation of the European grayling *Thymallus thymallus* (Actinopterygii, Salmonidae) from wild populations and hatcheries. *Zoologischer Anzeiger* 272: 73-80.

IUCN. 2020. The IUCN Red List of Threatened Species. Version 2020-2. Available at: [www.iucnredlist.org](http://www.iucnredlist.org). (Accessed: 13 June 2020).

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## External Resources

For [Supplementary Material](#), and for [Images and External Links to Additional Information](#), please see the Red List website.

# Appendix

## Habitats

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Habitat	Season	Suitability	Major Importance?
5. Wetlands (inland) -> 5.1. Wetlands (inland) - Permanent Rivers/Streams/Creeks (includes waterfalls)	-	Suitable	-

## Threats

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Threat	Timing	Scope	Severity	Impact Score
7. Natural system modifications -> 7.2. Dams & water management/use -> 7.2.9. Small dams	Ongoing	-	-	Low impact: 3
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.3. Indirect species effects		
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.2. Named species (Thymallus thymallus)	Ongoing	-	-	Low impact: 3
	Stresses:	2. Species Stresses -> 2.3. Indirect species effects		
8. Invasive and other problematic species, genes & diseases -> 8.2. Problematic native species/diseases -> 8.2.2. Named species (Unspecified PHALACROCORACIDAE)	Ongoing	-	-	Low impact: 3
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
11. Climate change & severe weather -> 11.2. Droughts	Future	-	-	No/negligible impact: 1
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
11. Climate change & severe weather -> 11.3. Temperature extremes	Future	-	-	No/negligible impact: 1
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		

## Conservation Actions in Place

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Conservation Action in Place
In-place research and monitoring
Action Recovery Plan: Yes



<b>Conservation Action in Place</b>
Systematic monitoring scheme: Yes
In-place land/water protection
Conservation sites identified: Yes, over entire range
Area based regional management plan: Yes
Occurs in at least one protected area: Yes
Invasive species control or prevention: Yes
In-place species management
Successfully reintroduced or introduced benignly: Yes
Subject to ex-situ conservation: Yes
In-place education
Subject to recent education and awareness programmes: Yes

## Conservation Actions Needed

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

<b>Conservation Action Needed</b>
1. Land/water protection -> 1.1. Site/area protection
1. Land/water protection -> 1.2. Resource & habitat protection
2. Land/water management -> 2.1. Site/area management
2. Land/water management -> 2.2. Invasive/problematic species control
2. Land/water management -> 2.3. Habitat & natural process restoration
3. Species management -> 3.2. Species recovery
3. Species management -> 3.3. Species re-introduction -> 3.3.1. Reintroduction
3. Species management -> 3.4. Ex-situ conservation -> 3.4.1. Captive breeding/artificial propagation
4. Education & awareness -> 4.1. Formal education
4. Education & awareness -> 4.3. Awareness & communications

## Research Needed

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

<b>Research Needed</b>
1. Research -> 1.5. Threats
1. Research -> 1.6. Actions

<b>Research Needed</b>
2. Conservation Planning -> 2.1. Species Action/Recovery Plan
2. Conservation Planning -> 2.2. Area-based Management Plan
3. Monitoring -> 3.1. Population trends
3. Monitoring -> 3.4. Habitat trends

## Additional Data Fields

<b>Distribution</b>
Estimated area of occupancy (AOO) (km <sup>2</sup> ): 8
Continuing decline in area of occupancy (AOO): No
Extreme fluctuations in area of occupancy (AOO): No
Estimated extent of occurrence (EOO) (km <sup>2</sup> ): 700-2625
Continuing decline in extent of occurrence (EOO): No
Extreme fluctuations in extent of occurrence (EOO): No
Number of Locations: 2
Continuing decline in number of locations: Yes
Extreme fluctuations in the number of locations: No
<b>Population</b>
Continuing decline of mature individuals: Yes
Extreme fluctuations: No
Population severely fragmented: Yes
No. of subpopulations: 2
Continuing decline in subpopulations: No
Extreme fluctuations in subpopulations: No
All individuals in one subpopulation: No
<b>Habitats and Ecology</b>
Continuing decline in area, extent and/or quality of habitat: Yes
Generation Length (years): 5
Movement patterns: Not a Migrant

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