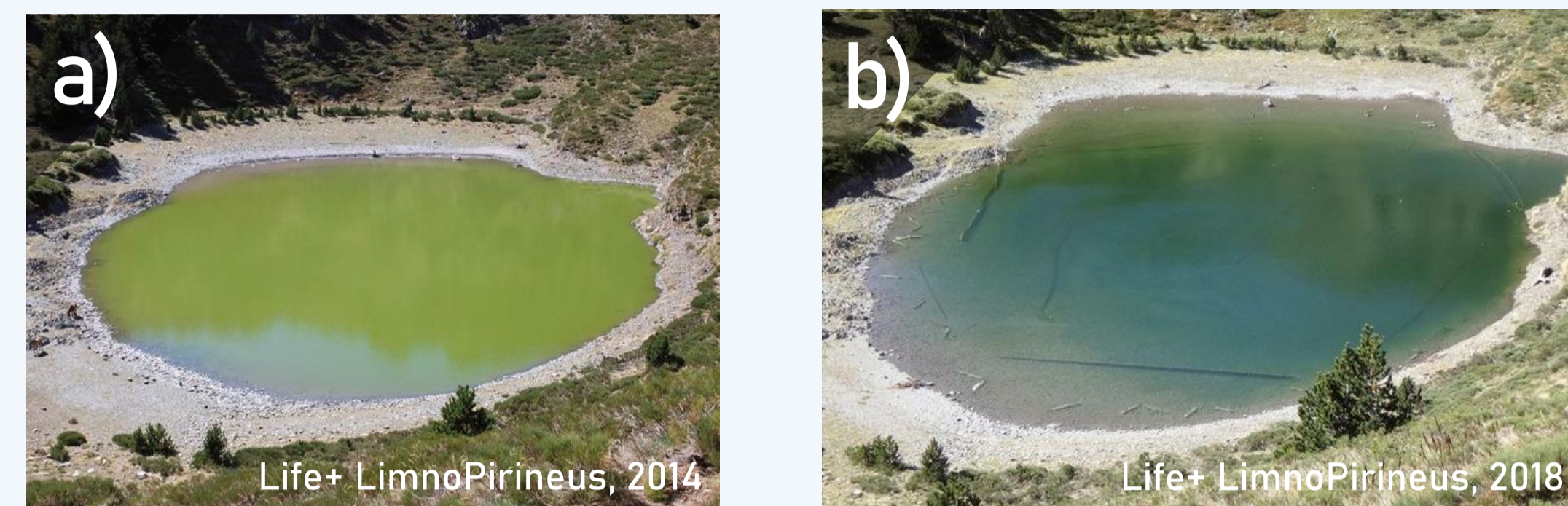


IMPACT AND MANAGEMENT OF INVASIVE ICHTHYOFAUNA IN PYRENEAN HIGH MOUNTAIN LAKES

Only one of these lakes is inhabited by fish. Which one would you say?



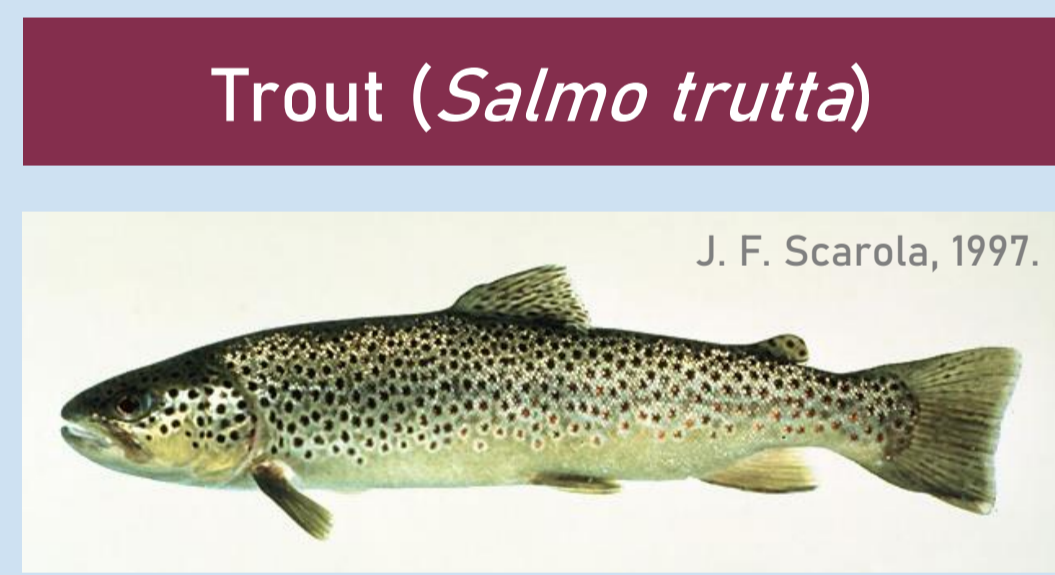
Closell lake before and after invasive fish eradication. a) 2014, b) 2018.

Naturally, Pyrenean high mountain lakes are fishless ecosystems due to their hydrogeographic isolation. However, most of these water bodies are currently inhabited by stable populations of invasive fishfauna, which cause important impacts in lake ecosystems.

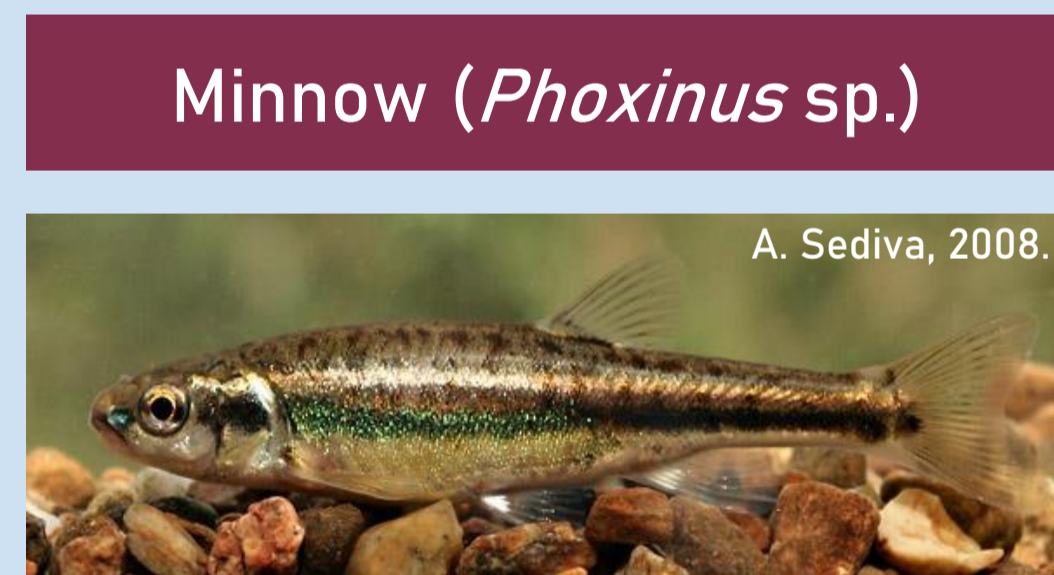
LIFE+ LimnoPirineus Project

- 2014 - 2019
- Sampling of 1736 lakes
- Eradication of ichthyofauna in 8 lakes
- Electro-fishing, fyke netting and gill netting

Invasive species and introduction pathways



Introduced for sportive fishing activities



Introduced as a live bait for trout fishing

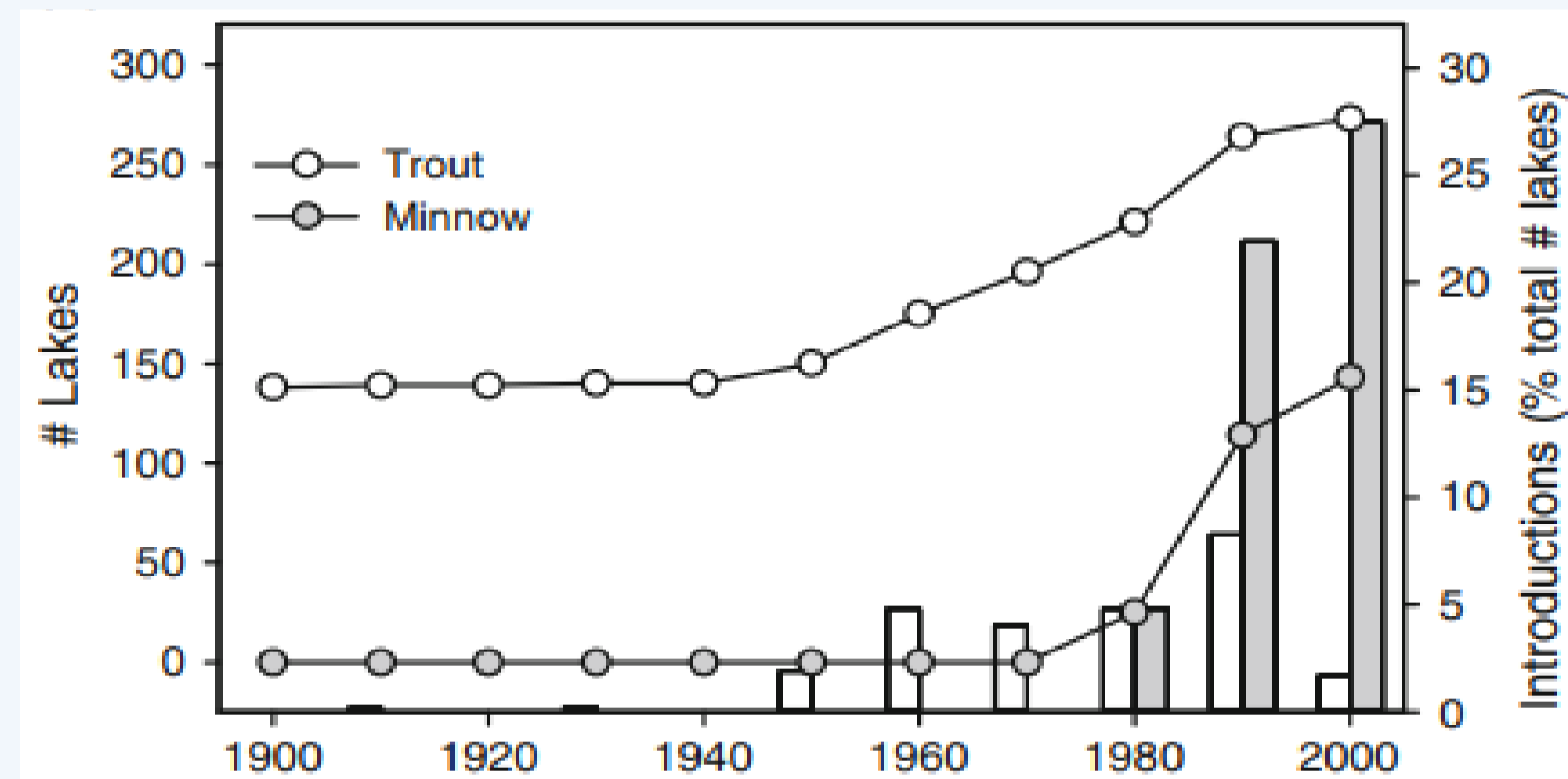


Figure 1. Introduction process of minnow compared to trout in the southern Pyrenees. (Miró and Ventura, 2015).

Impacts

- Alteration of trophic relationships
- Predation of amphibian larvae, sub-adults and adults
- Predation of phytoplanktophagous crustacean

↳ Negative effects in water quality



Results

- 2014 16 colonisation events by amphibian species
- 2015 8 colonisation events by amphibian species
- 2016 Achievement of typical levels of richness and abundance for all species (except *Rana temporaria*)

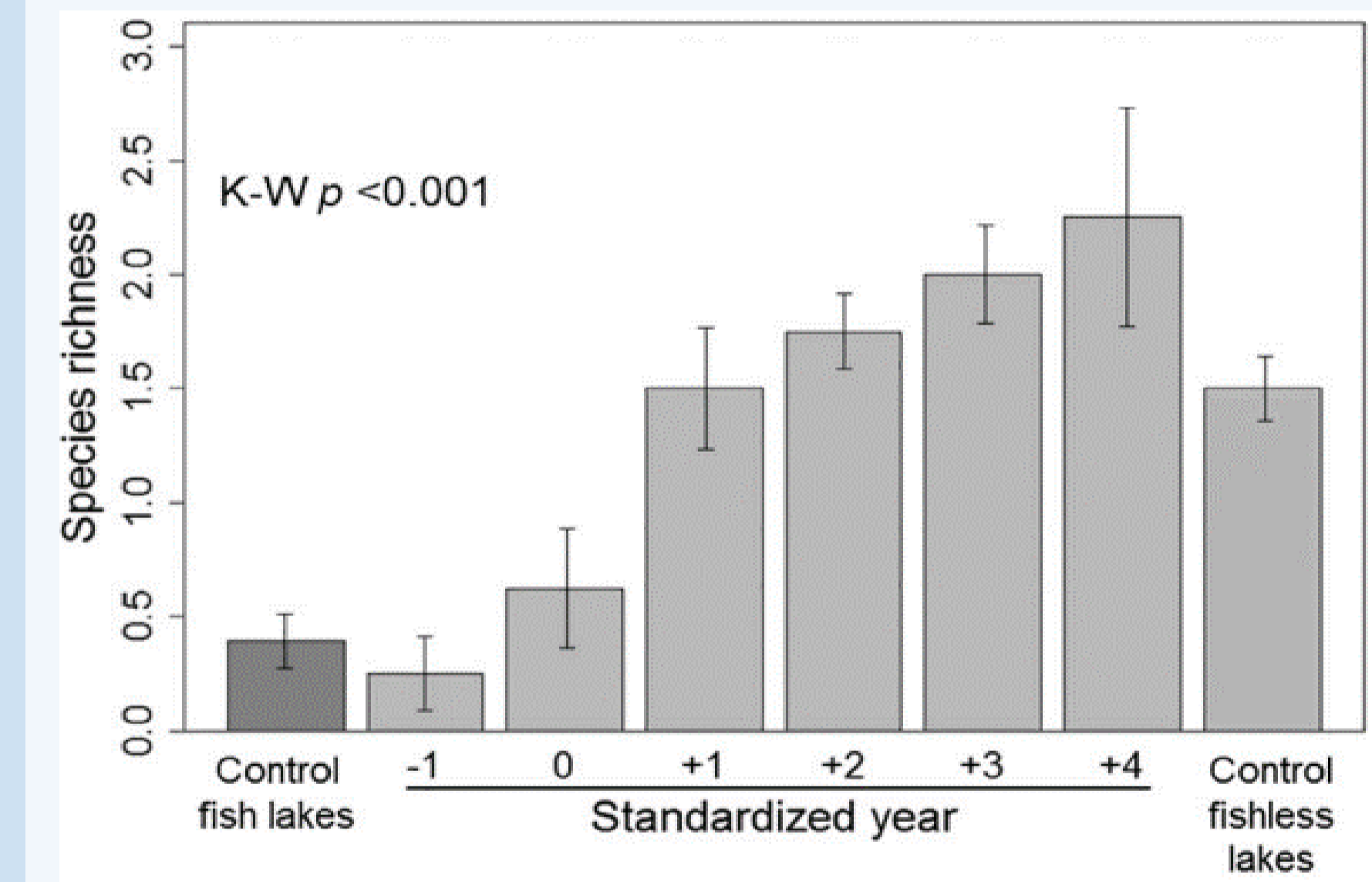


Fig. 2. Changes in amphibian richness during fish removal works in the eight studied lakes. (Miró et al, 2020).

Conclusions

- Rapid recovery of amphibian communities with the removal or the reduction of non-native fish
- Potential of this technique for managing invasive ichthyofauna
- Relevance of prevention, vigilance and environmental awareness to avoid new introductions