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EDITORIAL

Conservation and prejudice: why adopt double standards for fish and homoeothermic vertebrates?

Biological invasions are commonly recognised among the most significant elements of global change (Genovesi et al. 2015; Fenoglio et al. 2016) and represent one of the leading causes of local biodiversity loss and ecosystem alteration (Carosi et al. 2017). There is much discussion about how to manage species representing a threat for biodiversity, and invasive species are judged not only on their origin (Davis et al. 2011) but also on their systematic position. This difference in attitude is particularly evident in some countries such as Italy, where perception of public opinion about different animal taxa overcomes technical recommendations.

A paradoxical example is the difference in treatment between invasive fish and vertebrate homoeothermic (i.e. bird and mammal) species. The control of invasive fish by massive overfishing, poisoning and trapping campaigns is an accepted practice (Britton et al. 2011). For example, a recent project was performed with the aim to eradicate Brook trout (*Salvelinus fontinalis* Mitchell, 1814) from Alpine lakes in the Gran Paradiso National Park (Tiberti et al. 2017). Moreover, in Italy not only is the European Catfish (*Silurus glanis* Linnaeus, 1758) legally captured by anglers, but new regional laws require the killing of any fished specimen. Additionally, several campaigns for the active removal of this species are constantly being held and financed by local governments. Invasive fish eradication or control campaigns can have good effectiveness regarding the restoration of biodiversity and the preservation of peculiar taxa, such as amphibians in the above-mentioned alpine lakes, or native trout species (Buktenica et al. 2013).

On the other hand, even if the number of invasive species is also growing among birds and mammals (Keller et al. 2011; Mori et al. 2014), management strategies for these groups are always more cautious.

None of the invasive bird species present in Italy is subjected to a control or eradication plan, while in other countries similar operations have been performed successfully (Henderson 2009). For instance, regarding the recently introduced and potentially problematic sacred ibis (*Threskiornis*

aethiopicus Latham, 1790), the French authorities long ago decided to adopt control campaigns based on egg sterilisation and shooting (Clergeau et al. 2005), while Spanish specialists have not hesitated to order the immediate elimination of the few specimens that arrived in Coto Doñana Park from France (CABI 2017). Conversely, in Italy any management plan is being hindered at present. Among mammals, the management of the coypu (*Myocastor coipus* (Molina, 1782)) unleashed a still-ongoing fierce discussion between technicians, administrators and some components of Italian public opinion. Similarly, the failure of the grey squirrel (*Sciurus carolinensis* Gmelin, 1788) eradication project in Italy is a symptomatic and almost anecdotal case (Bertolino & Genovesi 2003).

Considering these last few examples, it is unlikely that public opinion, media and politicians would have the same reaction if a fish, and not a bird or a mammal, species was to be managed. Associations for animal welfare usually have an *a priori* opposition to controlling birds or mammals, but seem to have little or no interest in the management of fish. Consequently, administrations and wildlife agencies are extremely concerned to avoid the “bad press” that inevitably accompanies control efforts of bird and mammal (but not fish) species.

The scientific community has delineated effective strategies to manage and control the spreading of more or less all alien taxa in Italy, but awareness campaigns are similarly important in order to obtain the conscious support of the public. In fact, the species that the public does not know are managed with a scientific approach (with a few exceptions, such as invasive water frogs of the genus *Pelophylax*), the other species not. This difference in treatment between invasive fish and vertebrate homoeothermics seems even more puzzling and paradoxical when we consider that, at present, control plans are widely put in place in Italy for both native birds and mammals, showing clear negative impact on human activities (e.g. wild boars, foxes, carrion crows). Therefore, avoiding controlling problematic invasive birds and mammals is even less justifiable.

In the last few years, technical and scientific decisions have been (in numerous fields, not just in zoology) increasingly hostage to subjective, emotional and irrational attitudes, and this is unacceptable. Most zoologists seem to be either unaware of or unconcerned about these arguments, but it is evident that parts of conservation strategies are often made in a more emotional than technical way, and that double standards are adopted for fish and homoeothermic vertebrates.

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