

COMING TO TERMS WITH ASSISTED MIGRATION

M. Hällfors, E. Vaara, M. Hyvärinen, M. Oksanen, L. Schulman H. Siipi, S. Lehvävirta

WHAT IS ASSISTED MIGRATION?

The intentional moving of species, populations, or other biological units threatened by climate change is being discussed as a conservation measure.

However, the measure has not been articulated consistently, which is reflected as varying use of terms and definitions in the literature concerning the issue called *assisted migration*, *assisted colonisation*, or *managed relocation* among others.

When discussing and studying any topic, it is important that everybody involved is consistent with and aware of what terms and definitions refer to a specific idea.

We reviewed the literature and found 40 terms and almost 75 definitions for the measure. We argue that *assisted migration* is a suitable term for this conservation measure and we define it as follows:

Assisted migration means safeguarding biological diversity through the translocation of representatives of a species or population harmed by climate change to an area outside the indigenous range of that unit where it would be predicted to move as climate changes, were it not for anthropogenic dispersal barriers or lack of time.

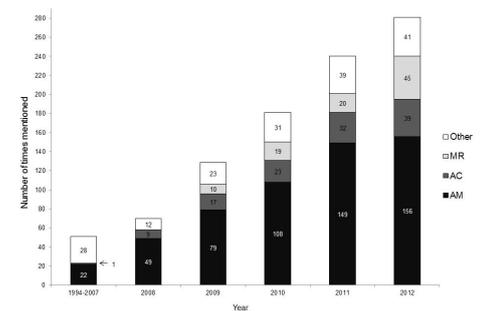


Fig. 1 Frequency of terms related to moving species under climate change. AM = assisted migration; AC = assisted colonization; MR = managed relocation; Other = all other terms found in the literature search

Term	Definition	Source
1. Reinforcement	The intentional movement and release of an organism into an existing population of conspecifics.	IUCN 2012
2. Reintroduction	The intentional movement and release of an organism inside its indigenous range from which it has disappeared	IUCN 2012
3. Conservation introduction	The intentional movement and release of an organism outside its indigenous range	IUCN 2012
4. Introduction	The intentional or accidental dispersal by human agency of a living organism outside its historically known native range.	IUCN 1987
5. Assisted migration	The safeguarding of biological diversity through the translocation of representatives of a species or population harmed by climate change to an area outside the indigenous range of that unit where it would be predicted to move as climate changes, were it not for anthropogenic dispersal barriers or lack of time	this paper

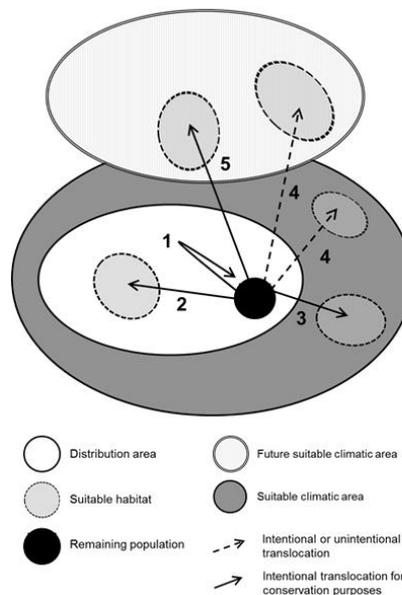


Fig. 2. Definitions and a model of translocation concepts. According to the IUCN (1987), *translocation* is defined as the movement of living organisms from one area with free release in another.

Within the wider concept of conservation translocation, different sub-concepts can be recognized (Fig. 2). Assisted migration differs from any other conservation-driven translocation of biological units outside their current range by the following three aspects:

- It is directional and based on a prediction of the potential future distribution of the biological unit;
- It is limited to translocations as a way to overcome temporal or spatial dispersal limitations; and
- It is used to mitigate threat caused directly or indirectly by anthropogenic climate change.

CRITERIA FOR ASSISTED MIGRATION

An essential question is for which species, populations, or other biological units AM should be used. Based on our definition, we draw conclusions of what characteristics a species should have for AM to be the right conservation method (Fig 3). But how can we know if a species fulfills the criteria? This is one of our central research questions in the future.

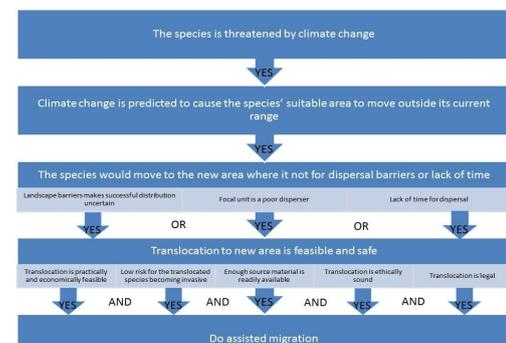


Fig. 3. Criteria for evaluating the need of AM for specific biological units (here denoted as *species*). Available at www.luomus.fi/escape