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**Submission of information on Risk Assessment and Risk Management  
under the Cartagena Protocol: Response to CBD Notification**  
SCBD/CPU/DC/MA/MW/87798

In addition to the information submitted by the EU and its Member States, Sweden would like to submit the following information in response to Notification 2019-009.

*Experience with risk assessments and challenges*

Sweden has no experience in undertaking risk assessments of living modified organisms containing engineered gene drives or living modified fish, although genetically modified aquarium fish have been detected in Europe. At present, these living modified aquarium fish are of tropical origin and usually modified only in color and cannot establish in Sweden. However, with the future development of hardier aquarium fish species this could change. Given the history of frequent introductions of aquarium animals and plants to the environment due to actions of aquarium owners, it is probable that living modified fish will be introduced to the environment at some time.


The introduction of genetically modified fast growing salmon (Aquadvantage) to the North American market and development of other fish for consumption is a potential threat to native fish, especially the native salmon (*Salmo salar*). Conservation of the genetic integrity of the native salmon, as well the protection and restoration of their habitats, is of great importance for Sweden's biological diversity in freshwater and marine environments. Significant scientific and conservations efforts have been directed towards preserving and restoring local native salmon races and their habitats. At present, the greatest threat to the genetic integrity of salmon is domesticated salmon that have escaped from cultivation. Should cultivation of living modified salmon or other fish move from very expensive, relatively secure, land-based cultivation facilities to less expensive freshwater or marine based facilities, escape of LM fish to the environment will be inevitable. Risks for native salmon and other wild fish

would thereby increase exponentially. The risks to the native population will differ depending on species and the modified trait. It is thus important to prepare for future risks and develop guidance that can take into account possible changes and developments in managing living modified fish.

*Need for practical guidance on risk assessment*

Although a number of guidances are available for risk assessment of genetically modified animals and fish (see the EU submission to this notification), it is difficult to put together and practically apply the many proposals for risk assessment methodologies and factors contained in these documents. Methods are lacking for assessing the risks and long-term and indirect consequences of the spread and interaction of escaped genetically modified fish with wild populations of non-modified fish and the ecosystem. Information is not adequately given to enable assessment of the potential spread of modified genes to wild populations of fish and consequences for the ability of wild populations to evolve as the environment changes and their fitness.

With best regards



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