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ATA Scientific Travel award entries March 2014

The Question:

As the world faces significant environmental and economic impacts from climate change, scientists will be called on for their expertise but in the end, engaged citizens may be the ones who decide which rescue projects receive funding and ultimately what survives.

Imagine this did happen. Describe which animal species (non-human) or habitat you would give highest priority to save and why?

1/ **Marjorie Griffiths, PhD Candidate,** Victoria University of Wellington, School of Chemical and Physical Sciences

As the world changes faster than scientists can measure it will become incredible challenge to maintain natures' balance. The challenge of saving plankton from extinction is an enormous task, I believe it will be one of the biggest conservation challenges the world will face. Although, the number of plankton is difficult to estimate due to the unknowns of the deep sea, about 50,000 different planktons live in the light zones of the sea providing vital energy/food to marine life. Phytoplankton partakes in photosynthesis converting carbon dioxide to oxygen providing earth with 50 % of its oxygen supply. Without plankton, life would be difficult and many other animal and plant species would struggle to exist. Saving plankton will require a enormous network of scientist all over the world from the most extreme environments where data will be collected from biological observations of populations, visualisation through various microscopy techniques to even understanding the natural movement of plankton in ocean currents through single organism experiments will aid in a fundamental understanding of planktons ability adapt to the rising oceans. Beyond saving the natural habitat of plankton it is also important for the production of energy, nutrients and fertilisers all vital to human existence. Plankton's energy is already harnessed for biofuel production, while not yet widely accepted, as other natural resource diminish these technologies will become more prominent. In food production plankton may also be used at a nutrient source for plants as a fertiliser but also be used in food products to make 'super foods'. If plankton becomes extinct the world will become a place we no longer recognise as our oceans will die, and the ability to use plankton to better our lives through biomimetic design will become inherently more difficult.

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2/ **Mr Omar Mendoza Porras**, Flinders University, School of biological sciences

The eye-less Turse

Considering Noah's temporary success with the animal kingdom, we will create a new species. In times of impending polar ice melting and flooding on the majority of the Earth's surface, only little islands will remain for mankind to flourish, the Turse would be created (Fig.1). Starvation and inability to relocate between islands will be the major issues. Using bioengineering, some luck and protocols from nature, science and H.G wells[1], the Tuna-horse or Turse, would be created from Equus Caballus (domestic horse) and thunnus albacares (yellow-fin tuna) genetic pools. This mythological-like but useful creature would help resettle the human into its new aqueous environment. Due to the prevailing watery situation, the Turse will be mainly aquacultured, using standard protocols kindly provided by yellow-fin tuna farmers from Baja, Mexico. To successfully nourish the equine component, expert advice from horse breeders famous for feeding winners of the Melbourne cup will be sought. The usefulness of the Turse will rely on their ability to become both food and transport in the new aqueous world. While protein would swallop (swim-gallop) to everyone's table, the Turse will also provide transportation from one island to another. To compensate for the Turses' blindness[2,3] GPS equipment will be installed for ocean navigation. Across history, it has been seen that human bonds with animals (e.g. Jimmy giggle and hoot; Calvin and Hobbes), consequently it is expected that humans will also bond with Turses. For that reason Turses will be bioengineered to lack eyes, therefore decreasing the likelihood of bonding and possible moral issues when transport becomes food. For the reasons stated above our project should be favoured by the vox populi.

References

1. Wells, H.G. **The Island of Doctor Moreau**. Mendoza editorials. 300p. 1896, London, UK.
2. Waterhouse, G**. Horse blindness, genetic manipulation for successful *Equus caballus* eyes ablation: Never wipe the horse's eyes again.** *Journal of equine ophthalmology*. 2014. 1 (1) 1-7pp.
3. **F.A.O. Tuna blindness*, genetic manipulation for* successful *Thunnus albacares* eyes ablation: Don't feel guilty over deep frying a whole fish**. *Journal of Ichthyo-ophthalmology*. 2014. 1 (1) 1-5pp.

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Disclaimer: This grant application did not pass any ethical code of conduct in any institution and failed to comply with demands of every animal protection NGO.

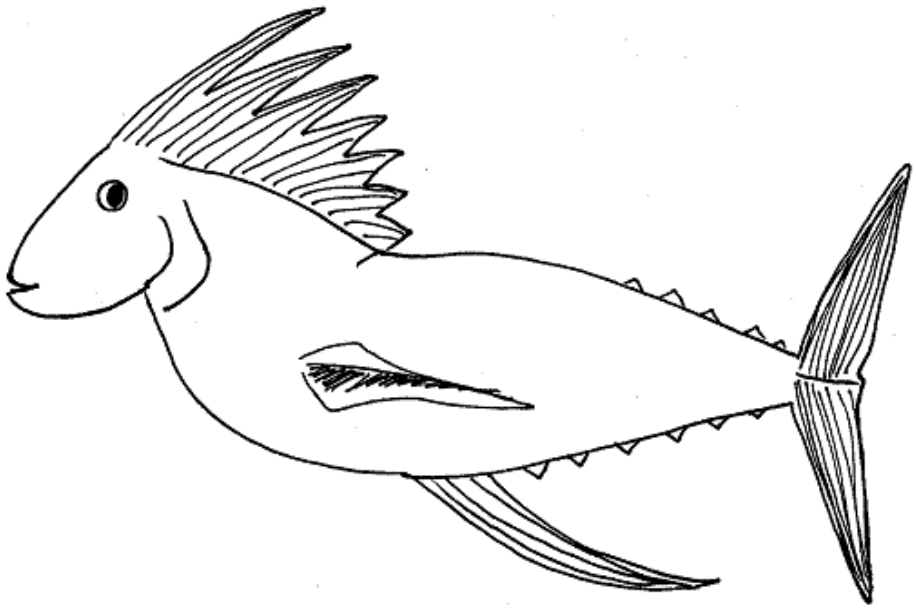

Fig.1-Schematic representation of a bioengineered Turse. The eyes are for advertising purposes only.

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3/ **Miss Marie-Claire Demers,** University of Wollongong, School of Biological Sciences

When it comes to conservation, seagrass ecosystems, deserve undoubtedly the highest priority. These marine flowering plants are one of the most threatened ecosystems worldwide, with staggering rates of decline in recent years. Approximately 1/3 of the world's seagrasses have disappeared and 1 in 5 seagrass species is at risk of extinction. Seagrass meadows have intrinsic biological, social and economical values partly resulting from the vast biodiversity they sustain. Among the range of vital ecosystem services they provide, seagrass meadows serve as a nursery habitat to an array of commercially important marine species. They are crucial to a large number of rare and threatened species, including dwarf seahorses, green sea turtles and dugongs. Seagrass meadows play a fundamental ecological role as ecosystem engineer by enhancing sediment stability, reducing wave action and promoting the filtration of suspended sediments and nutrients. This results in enhanced water quality and unmatched visibility, attracting ocean enthusiasts and contributing to the revenue of local communities through marine tourism. Most importantly, this ecosystem is an intensive carbon sink with a carbon storage capacity ten times more efficient than that of a pristine rainforest. The destruction of seagrass meadows lead to the release of this trapped blue carbon into the atmosphere exacerbating climate change. Human disturbances are the main drivers of global seagrass decline, especially dredging, mooring scars and runoff of pollutants. These destructive practices have caused irreversible damage in the past, such as disease outbreak and the disappearance of seagrass associated species through food chain degradation. Considering that some seagrass species are slow, even unlikely to recover following anthropogenic disturbances, conservation and effective management must be given priority over rehabilitation efforts. The loss of this ecosystem is simply not an option.