Shark Bay Fish Yield Enhancement Project

About 70% of the world's surface is covered in oceans, and the upper part of these (where light can penetrate) is inhabited by algae. In some oceans, the growth and reproduction of these algae is limited by the amount of iron in the seawater. Iron is a vital micronutrient for phytoplankton growth and photosynthesis that has historically been delivered to the pelagic sea by dust storms from arid lands. This aeolian dust contains 3–5% iron.

The Redfield ratio describes the relative atomic concentrations of critical nutrients in plankton biomass and is conventionally written "106 C: 16 N: 1 P." This expresses the fact that one atom of phosphorus and 16 of nitrogen are required to "fix" 106 carbon atoms. Recent research has expanded this constant to "106 C: 16 N: 1 P: .001 Fe" signifying that in iron deficient conditions each atom of iron can fix 106,000 atoms of carbon. Recent marine trials suggest that one kilogram of iron may generate well over 100,000 kilograms of plankton biomass.

Ferrous sulphate ($FeSO_4$) is 16.5% iron. One tonne of ferrous sulphate, with a cost of $100 per tonne, would produce 16,000 tonnes of plankton biomass. Assuming 25% conversion to plankton-eating organisms, and a further 25% conversion of planton-eaters to fish, adding one tonne of ferrous sulphate per day to Shark Bay waters would increase the fish yield of Shark Bay by one thousand tonnes per day. This would be at a cost of $0.10 per tonne of fish. The fish so produced might retail at $10,000 per tonne, making it a 100,000 to one economic return.

Once successful in Shark Bay, iron fertilisation could be undertaken in Exmouth Gulf and other places on the coast of Western Australia.

The potential return is so enormous that it would be irresponsible not to trial iron fertilisation in Shark Bay. It could be very easily incorporated in the pumped storage project for power from wind.