

Notes from Ruud Kleinpaste event (Bugs & Biodiversity), March 2nd, 2021.

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- As the human population continues to grow, conversely the amount of Biodiversity on Earth decreases.
- Global warming, Greenhouse emissions and specie loss is not new information.
- We know what to do, therefore there are no excuses.
- Combatting climate change – examples:
 - social changes such as educating girls and women which in turn leads to smaller families and a stabilizing population. This puts less stress on the finite resources on Earth.
 - Energy science such as wind turbines and low impact refrigeration
 - moving towards more plant-based diets, less food waste – being more innovative
 - Afforestation and regenerative agriculture
 - Protecting tropical rain forests
- Life has been evolving and adapting for 3.8 billion years.
 - **Every tree**
 - Intercepts solar energy
 - Lives collaboratively with fungi.
 - Makes complex sugars and food.
 - Feed's insects
 - Sequesters Carbon from the atmosphere.
 - Producers' Oxygen
 - Provides sites for epiphytes and foods for birds.
 - Fix's nitrogen self-replicates
 - Host many, many organisms.
 - Supports a healthy water cycle.
 - Creates micro-climates.
 - Stabilizes soils.
 - **For free!**
 - What do human's offer?
 - We joined this sustainable ecosystem roughly 200,000 years – young!
 - Like "Toddlers playing with matches."
 - Are we a welcome species - beneficial & contributing, or invasive & exploiting?
 - As a society we are becoming more disconnected from nature, specifically in large cities.

- How to reconnect? – **Nature Literacy**
 - to re-discover the operating Manual of Earth.
 - first educate teachers on nature literacy so that this can then be passed down to kids
 - Involving young people in the rehabilitation and restoration of species, connects them with life but they also learn the importance of eco-systems and how reliant we are on them.
 - Nature
 - Runs on sunlight.
 - Uses only the energy it needs (Sustainable)
 - Recycles, no waste (Resourceful)
 - Strategy involves ecological cooperation.
 - Operates on diversity using local expertise and life-friendly chemistry.
 - Must live where it works (there is no factory at the edge of the town)
 - Provides Security of Life
 - Planet Earth, approximately the only of its kind.
 - We are deeply connected to our planet; must serve to protect
 - In the Hurunui
 - Example: Waipara River
 - Explore the “NOW” - the mouth is a unique estuarine system of national and international importance for threatened birds
 - Explore the “PAST” – river fossils e.g. Mannering’s Penguin, the world’s oldest known penguin fossil, dating back about 62 million years. At 1.2 metres and 30 kgs it is taller and heavier than the living Emperor Penguin of Antarctica.
 - “Moko’s Book” written by Hurunui students.
 - Celebrating biodiversity in the Hurunui district, 2014
 - <http://sonnywhitelaw.com/wp-content/uploads/2017/05/Celebrating-biodiversity-in-the-hurunui-district.pdf>
- Nature services
 - Human design modelled on nature – **Biomimicry** – eco-friendly “free guide.”
 - Robotics: e.g., first moon buggy had “Cockroach legs”
 - Flying: copying wing structure of birds and insects
 - Insect wings – “solar panels”
 - Natural colour dyes
 - Underwater glue (caddis fly)
 - Hydrophobic and self-cleaning (leaves)
 - Wind farms inspired by fish vortices.
 - Living filtration systems
 - Using pipes made from organic matter to absorb, filtrate and sequestration.
 - Able to naturally remove unwanted nutrients or run-off and then re-use back onto the land without adding more.

- Integration of **Biomimicry** with **Urban designs**.
 - Currently cities do not serve any ecological purpose, they degenerate.
 - Create cities that serve just as native forests do.
 - Pollination services.
 - Sequester carbon.
 - Roof-tops build soil.
 - Provide food.
 - Capture store and release water.
 - Clean the air.
 - Invite biological scientists to the design discussions.
 - Misconceptions of survival of the fittest.
 - Adaptation is the key to survival for any specie.
 - Cooperation not competition, and its everywhere!
 - Collaboration, facilitation & partnerships.
 - “Mutualistic Symbiosis”.

- How does business grow, compared with “Nature’s Business”?
 - Humans mostly uncontrolled quantity based linear systems.
 - Take > make > dispose > waste.
 - Nature’s value and quality based circular system.
 - Elegance of design, then cycling nutrients through living systems
 - With all Nature’s free goods and services, shouldn’t they be on our balance sheet?

- The term “Sustainable”
 - often used lightly, or in the context of doing “less bad” instead of “more good”.
 - Is our goal to really be Carbon neutral? Reducing our negative impact to be *eco-efficient*.
 - Or aim above zero, maximizing our positive impact to be *eco-effective*.

- Myths, Science, Language, Art
 - Misinterpretations of natural phenomena with language of new age technologies, such as the ‘Cloud’ or a ‘Website’, paints a false narrative for these processes.
 - The myth of the White-tail spider; that it preyed on Daddy long-legs to extract its venom and enhance its own. False: White tails find it impossible to creep up on Daddy long-legs, instead being covered in sticky silk from the Daddy long-legs and becoming their lunch!
 - Nature is one of the greatest forms of art; through movement and colour, inspires human art, dance, emojis, etc.

- Environment as a context for Education
 - Numeracy
 - Literacy
 - Stories from Nature

- Ecosystem food chains operate on biodiversity.
 - All animals have a purpose and role to fulfil.
 - Birds, Ants and Weta all are great seed dispersers.
 - Earwigs an organic way to remove other pests from Apple orchards.
 - Mosquito larvae
 - clean water, feeding on bacterial soup (think troughs)
 - are food for water born insects and small fish who are then food for birds, eels
 - become adults who pollinate flowers; are food for birds, spiders, dragonflies and just require us to contribute a few drops of blood to continue the cycle.

 - Earwigs: an organic way to remove other pests from Apple orchards.
 - Network Systems such as Mycorrhiza (fungi): largest living organism on the planet
 - Trees are connected through this network and can communicate and re-transport nutrients to one another.