

PRINCIPLES FOR UNDERSTANDING AND SUSTAINING THE EARTH

Resources Pollution and Environmental Degradation

- Resources are limited and must not be wasted; there is not always more (principle of limits).
- Most wastes and pollution are either resource we are too dumb to use or are so dangerous they shouldn't have been produced (no waste-in nature principle).
- To reduce pollution and resource use and waste, recycle or reuse mineral resources (principle of recycling and reuse).

Recycling mineral resources takes energy, which in being produced and used causes pollution and environmental degradation (recycling-is-not-the-ultimate-answer principle).

- To reduce resource waste and resource supply interruptions, get as much as possible of what we need locally and dispose of or recycle wastes locally (principle of localism).
- To reduce pollution and resource use and waste, use resources primarily to meet vital needs and use these resources as efficiently as possible (principle of moderation).
- Stress the use of perpetual and renewable resources and use renewable resources no faster than they are replenished by natural processes (principle of sustainable yield).
- Try to get resources from any sources; don't put all your eggs in one basket (principle of resource diversity).
- Everyone is downwind or downstream from everybody (principle of the global commons).

Matter and Energy

- We cannot create or destroy matter; we can only change it from one form to another. Everything we think we have thrown away is still here with us in one form or another (law of conservation of matter).
- Organized and concentrated matter is high-quality matter that can usually be extracted, processed and converted into useful resources at an affordable cost; disorganized and dispersed matter is low-quality matter that often costs too much to convert to a useful resource (principle of matter quality).
- Don't dilute, disperse or mix matter products or wastes that can be recycled (principle of affordable recycling).
- We cannot create or destroy energy; we can only change it from one form to another. We can't get energy for nothing; it takes energy to get energy (first law of energy, or law of conservation of energy).
- Organized or concentrated energy is high quality energy that can be used to do things; disorganized or dilute energy is low-quality energy that is not very useful (principle of energy quality).
- In any conservation of energy from one form to another, high-quality, useful energy is always degraded to lower-quality, less useful energy that can't be recycled to give high-quality energy (second law of energy or law of energy-quality degradation).
- Everything runs on moderate-to high-quality energy that can't be recycled, so choose and use energy resources wisely (principle of energy use and flow).
- Don't use high-quality energy to do something that can be done with lower-quality energy; don't use a chain saw to cut butter or electricity to heat a house or household water (principle of matching energy quality to energy tasks).

Ecology

- In nature we can never do just one thing; everything we do creates effects that are often unpredictable (first law of ecology or principle of ecological backlash).
- Everything is connected to and intermingled with everything else, we are all in it together (second law of ecology or principle of inter-relatedness).
- Any chemical that we produce should not interfere with any of the earth's natural biogeochemical cycles in ways that degrade the earth's life support systems (third law of ecology or principle of chemical non-interference).
- The earth's life support systems can take a lot of stress and abuse, but there are limits (law of limits).
- Each species and each individual organism can tolerate only a certain range of environmental conditions (range-of-tolerance principle).
- No population can keep growing indefinitely (principle of carrying capacity).
- Nature is not only more complex than we think but also more complex than we can ever think (principle of complexity).

Economics

- The market price of anything should include all present and future costs of any pollution, environmental degradation or other harmful effects passed on to society and the environment (principle of internalizing all external costs).
- Try to get more output of goods and services from less resource input; do more with less (principle of increasing efficiency and productivity).
- Some forms of economic growth are harmful; don't produce harmful goods (principle of economic cancer).
- Don't waste resources trying to produce harmful goods more efficiently (principle of wasteful efficiency).
- Short-term greed leads to long-term economic and environmental grief; don't deplete capital and mortgage the future (no-free-lunch principle).
- The more things you own, the more you are owned by things (principle of over consumption and thing tyranny).
- Don't give people subsidies and tax breaks to produce harmful goods and unnecessarily waste resources; either eliminate all resource subsidies or reward only producers who reduce resource waste, pollution and environmental degradation (principle of economic and ecological wisdom).
- We cannot have a healthy economy in a sick environment (economics-as-if-the-earth-mattered principle).

Politics

- Human population growth ultimately makes democracy and individualism impossible (principle of freedom erosion).
- Anticipating and preventing problems is cheaper and more effective than reacting to and trying to cure them; an ounce of prevention is worth a pound of cure (prevention or input control principle).
- Every crisis is an opportunity for change (bad-news-can-be-good-news principle).
- Think globally, act locally (principle of change).
- Don't ever call yourself a conservative unless what you want to conserve is the earth (principle of true conservatism).

Worldview and Ethics

- We are part of nature (principle of oneness).
- We are a valuable species, but we are not superior to other species; all living beings, human and non-human, have the same inherent worth (principle of humility).
- Every living being has a right to live or at least struggle to live simply because it exists; this right is not dependent on its actual or potential use to us (respect-for-nature principle).
- Our role is to understand and work with the rest of nature, not conquer it (principle of cooperation).
- The best things in life aren't things (principle of love, caring and joy).
- Something is right when it tends to maintain the earth's live-support systems for us and other species and wrong when it tends otherwise; the bottom line is that the earth is the bottom line (principle of sustainability and ecocentrism).
- It is wrong for human to cause the premature extinction of any wild species and the elimination and degradation of their habitats (preservation of wildlife and biodiversity principle).
- We have a right to protect ourselves against harmful and dangerous organisms but only when we cannot avoid being exposed to such organisms or safely escape from the situation; in protecting ourselves we should do the least possible harm to such organisms (principle of self-defense).
- We have a right to kill other organisms to provide enough food for our survival and good health and to meet other basic survival and health needs but we do not have such rights to meet non-basic or frivolous wants (principle of survival).
- When we alter nature to meet what we consider to be basic or nonbasic needs, we should choose the method that does the least possible harm to other living things; in minimizing harm it is generally worse to harm a species than an individual organism and still worse to harm a biotic community (principle of minimum wrong).
- It is wrong to treat people and other living things primarily as factors or production whose value is expressed only in economic terms (economics-is-not-everything principle).

- We must leave the earth in as good a shape as we found it, if not better (rights-of-the-unborn principle).
- All people must be held responsible for their own pollution and environmental degradation (responsibility-of-the-born principle).
- No individual, corporation or nation has a right to an ever-increasing share of the earth's finite resources; don't let need slide into greed (principle of enoughness).
- We must protect the earth's remaining wild ecosystems from our activities, rehabilitates or restore ecosystems we have degraded, use ecosystems only on a sustainable basis and allow many of the ecosystems we have occupied and abused to return to a wild state (principle of ecosystem protection and healing).
- In protecting and sustaining nature, go further than the law requires (ethics-often-exceeds-legality principle).
- To prevent excessive deaths of people and other species, people must prevent excessive births (birth-control-is-better-than-death-control principle).
- Everything we are and have or will have ultimately comes from the sun and the earth; the earth can get along without us, but we can't get along without us, but we can't get along with the earth; an exhausted earth is an exhausted economy (respect-your-roots or earth-first principle).
- Don't do anything that depletes the earth's physical, chemical and biological capital that supports all life and human economic activities; the earth deficit is the ultimate deficit (balanced-earth budget principle).
- Love thy species and other species today and in the future as thyself (principle of species love and protection).
- To love and understand the earth and yourself, take time to experience and sense the air, water, soil, plants, animals, bacteria and other parts of the earth directly; learning about the earth indirectly from books, TV images and ideas is not enough (direct-experience-is-the-best-teacher principle).
- Learn about and love your local environment and live gently within that place; walk lightly on the earth (love-your-neighborhood principle).