Permaculture principles, methodology and web resources
Michael Pilarski's handout for permaculture workshops - January 25, 2010 version

Permaculture was started by Australians, Bill Mollison and David Holmgren in the mid-1970s.

"Permaculture offers a radical approach to food production and urban renewal, water, energy and pollution. It integrates ecology, landscape, organic gardening, architecture and agro-forestry in creating a rich and sustainable way of living. It uses appropriate technology giving high yields for low energy inputs, achieving a resource of great diversity and stability. The design principles are equally applicable to both urban and rural dwellers" - Bill Mollison

David Holmgren's 12 design principles

  1. Observe and interact - By taking the time to engage with nature we can design solutions that suit our particular situation.
  2. Catch and store energy - By developing systems that collect resources when they are abundant, we can use them in times of need.
  3. Obtain a yield - Ensure that you are getting truly useful rewards as part of the work that you are doing.
  4. Apply self-regulation and accept feedback - We need to discourage inappropriate activity to ensure that systems can continue to function well.
  5. Use and value renewable resources and services - Make the best use of nature's abundance to reduce our consumptive behaviour and dependence on non-renewable resources.
  6. Produce no waste - By valuing and making use of all the resources that are available to us, nothing goes to waste.
  7. Design from patterns to details - By stepping back, we can observe patterns in nature and society. These can form the backbone of our designs, with the details filled in as we go.
  8. Integrate rather than segregate - By putting the right things in the right place, relationships develop between those things and they work together to support each other.
  9. Use small and slow solutions - Small and slow systems are easier to maintain than big ones, making better use of local resources and producing more sustainable outcomes.
  10. Use and value diversity - Diversity reduces vulnerability to a variety of threats and takes advantage of the unique nature of the environment in which it resides.
  11. Use edges and value the marginal - The interface between things is where the most interesting events take place. These are often the most valuable, diverse and productive elements in the system.
  12. Creatively use and respond to change - We can have a positive impact on inevitable change by carefully observing, and then intervening at the right time.

The Principles of Permaculture Design (Mollison):

Whereas permaculture ethics are more akin to broad moral values or codes of behavior, the principles of permaculture provide a set of universally applicable guidelines which can be used in designing sustainable habitats. Distilled from multiple disciplines–ecology, energy conservation, landscape design, and environmental science–these principles are inherent in any permaculture design, in any climate, and at any scale. The following is a list of these principles.

[There were 12 original principles by Mollison. The latter (13-34) were added on over time and some are not directly from Mollison.]

1. Relative Location: Components placed in a system are viewed relatively, not in isolation.

2. Functional Relationship between components: Everything is connected to everything else.

3. Recognize functional relationships between elements: Every function is supported by many elements.

4. Redundancy: Good design ensures that all important functions can withstand the failure of one or more

element. Design backups.

5. Every element is supported by many functions: Each element we include is a system, chosen and placed so that it performs as many functions as possible.

6. Local Focus: "Think globally - Act locally" Grow your own food, cooperate with neighbors. Community efficiency not self-sufficiency.

7. Diversity: As a general rule, as sustainable systems mature they become increasingly diverse in both space and time. What is important is the complexity of the functional relationships that exist between elements not the number of elements.

8. Use Biological Resources: We know living things reproduce and build up their availability over time, assisted by their interaction with other compatible elements. Use and reserve biological intelligence.

9. One Calorie In/One Calorie Out: Do not consume or export more biomass than carbon fixed by the solar budget.

10. Stocking: Finding the balance of various elements to keep one from overpowering another over time. How much of an element needs to be produced in order to fulfill the need of whole system?

11. Stacking: Multilevel functions for single element (stacking functions). Multilevel garden design, i.e., trellising, forest garden, vines, groundcovers, etc.

12. Succession: Recognize that certain elements prepare the way for systems to support other elements in the future, i.e.: succession planting.

13. Use Onsite Resources: Determine what resources are available and entering the system on their own and maximize their use.

14. Edge Effect: Ecotones are the most diverse and fertile area in a system. Two ecosystems come together to form a third which has more diversity than either of the other two, i.e.: edges of ponds, forests, meadows, currents etc.

15. Energy Recycling: Yields from system designed to supply onsite needs and/or needs of local region.

16. Small Scale: Intensive Systems start small and create a system that is manageable and produces a high yield.

17. Make Least Change for the Greatest Effect: The less change that is generated, the less embedded energy is used to endow the system.

18. Planting Strategy: 1st-natives, 2nd-proven exotics, 3rd unproven exotics - carefully on small scale with lots of observation.

19. Work Within Nature: Aiding the natural cycles results in higher yield and less work. A little support goes a long way.

20. Appropriate Technology: The same principles apply to cooking, lighting, transportation, heating, sewage treatment, water and other utilities.

21. Law of Return: Whatever we take, we must return. Every object must responsibly provide for its replacement.

22. Stress and Harmony: Stress here may be defined as either prevention of natural function, or of forced function. Harmony may be defined as the integration of chosen and natural functions, and the easy supply

of essential needs.

23. The Problem is the solution: We are the problem, we are the solution. Turn constraints into resources. Mistakes are tools for learning.

24. The yield of a system is theoretically unlimited: The only limit on the number of uses of a resource possible is the limit of information and imagination of designer.

25. Dispersal of Yield Over Time: Principal of seven generations. We can use energy to construct these systems, providing that in their lifetime, they store or conserve more energy that we use to construct them or to maintain them.

26. A Policy of Responsibility (to relinquish power): The role of successful design is to create a self-managed system.

27. Principle of Disorder: Order and harmony produce energy for other uses. Disorder consumes energy to no useful end. Tidiness is maintained disorder. Chaos has form, but is not predictable. The amplification of small fluctuations.

28. Entropy: In complex systems, disorder is an increasing result. Entropy and life-force are a stable pair that maintain the universe to infinity.

29. Metastability: For a complex system to remain stable, there must be small pockets of disorder.

30. Entelechy: Principal of genetic intelligence. i.e. The rose has thorns to protect itself.

31. Observation: Protracted & thoughtful observation rather than protracted and thoughtless labor.

32. We are surrounded by insurmountable opportunities.

33. Wait one year: (See #31, above)

34. Hold water and fertility as high (in elevation) on the landscape as possible. Its all downhill from there.

This list of 46 principles is the longest I have seen in print. The list is in a vibrant state of growth and everyone in the movement uses slightly different lists of principles.

PERMACULTURE DESIGN METHODOLOGY
Michael Pilarski

1. Client interview, determine goals, resources, clarify values, client constraints. A questionnaire can be used as an interview guide (a la Max Lindegger) and/or filled out by the client at home (home is especially valuable if there is more than one person.) Client needs and resources: lifestyle; future development; number of people and form of involvement; finances available for the project, other resources, skills, interests. Ask women and children as well as men.
2. Resource inventory. List resources.
   Site observations/analysis: everything. (assets, problems), soils, water, vegetation (species & patterns). Constraints such as: soil erosion (gully, sheet, rill, wind), flooding/waterlogging, salinization, soil toxicities, weeds, diseases, insect pests, other pests, theft, wildfire danger, other hazards. Keep in mind that a year of observation before development is commendable.
-      Data collection: climate, soils, maps, catastrophic data. Local horticulture surveys and resource possibilities.
3. a) Prepare base maps.
   b) List themes.
   c) Apply principles and design methodology. Zone and sector analysis. - First functions, then species. Select elements - pattern assembly. Place elements - pattern relationship.

4.	Prepare a rough design for review with mapping (bubble design).
5.	Check with client, modify as needed. This feedback loop may be repeated a few or many times. Reiterative process.
6.	 Prepare report, maps (topographical and land use), staging, timetable (small achievable steps at a time for most clients), succession plantings. budgets, useful references (i.e. resource people, other clients, books & publications, government assistance, financial help, organizations, government restrictions, regulations, water zoning, permits needed). Cost benefit analysis. Crops/income sources (short, medium and long term).
7.	Implementation.
8.	Modification.

* Prioritize development steps in design. High on the priority list should be: access, fecncing, soil rehabilitation, erosion control, water supply, earthworks, roads, dams, swales, terraces, paths, nursery. Soil rehab before planting. Find best bulldozer operator.
* Generally create a nucleus and work out. Start at Zone one.
* Train your client in design. Educate the client.
* Permaculture design is applied science. Permaculture is implementation.
* Permaculture design is site-specific, culture-specific and client-specific.
* Function = performing a role. A list of some functions: windbreak, fertilizer, feeding livestock, bee forage, heating, improve porosity of soil, provide income, water collection, water purification, insect control.

Permaculture Design Methodology
O'BREDIM is a mnemonic and acronym for observation, boundaries, resources, evaluation, design, implementation and maintenance.

   * Observation allows you first to see how the site functions within itself, to gain an understanding of its initial relationships. Some people recommend a year-long observation of a site before anything is planted. During this period all factors, such as lay of the land, natural flora and so forth, can be brought into the design. A year allows the site to be observed through all seasons, although it must be realised that, particularly in temperate climates, there can be substantial variations between years.
   * Boundaries refer to physical ones as well as to those your neighbours might place on you, for example.
   * Resources include the people involved, funding, as well as what you can grow or produce in the future.
   * Evaluation of the first three will then allow you to prepare for the next three. This is a careful phase of taking stock of what you have at hand to work with.
   * Design is a creative and intensive process, and you must stretch your ability to see possible future synergetic relationships.
   * Implementation is literally the ground-breaking part of the process when you carefully dig and shape the site.
   * Maintenance is then required to keep your site at a healthy optimum, making minor adjustments as necessary. Good design will preclude the need for any major adjustment.

Permaculture Online resources.

http://www.permacultureactivist.net/

http://permacultureprinciples.com/

http://www.spiralseed.co.uk/permaculture/

http://en.wikipedia.org/wiki/Permaculture#External_links

http://permaculture.org.au/

http://www.holmgren.com.au/

http://www.permaculture.org/

http://attra.ncat.org/attra-pub/perma.html