System Condition 1

the NATURAL STEP

In a sustainable society, nature is not subject to systematically increasing:

… concentrations of substances extracted from the Earth's crust;

System Condition 1

In a sustainable society, nature is not subject to systematically Increasing concentrations of substances extracted from the Earth's crust.

This means substituting certain minerals that are scarce in nature with others that are more abundant, using all mined materials efficiently, and systematically reducing dependence on fossil fuels.

System Condition 2

the NATURAL STEP

- HALOGENATED COMPOUNDS
chlorodifluoromethane
chlorotrifluromethane
dichlorofluoromethane
chloromethane
trichlorofluoromethane
dichloroethylene
Freon 113
methylene chloride
chloroform
1,1,1 - trichloroethane
carbon tetrachloride
trichloroethylene
chloropentane
dibromochloromethane
tetrachloroethylene
dichloropropene
chlorobenzene
iodopentane
3-methyl-1-iodobutane
chloroethylbenzene
dibromodichloromethane
dichlorobenzene
chlorodecane
trichlorobenzene
- ALDEHYDES
acetaldehyde
methyl propanal
n-butanal
methylbutanal
crotoaldehyde
n-pentanal
n-hexanal
furaldehyde
n-heptanal
benzaldehyde
n-octanal
phenyl acetaldehyde
n-nonanal
methyl furaldehyde
n-decanal
n-undecanal
n-dodecanal
- KETONES
acetone
methyl ethyl ketone
methyl propyl ketone
methyl vinyl ketone
ethyl vinyl ketone
2-pentanone
methyl pentanone
methyl hydrofuranone
2-methyl-3-hexanone
4-heptanone
3-heptanone
2-heptanone
methyl heptanone
furyl methyl ketone
octanone
acetaphenone
2-nonanone
2-decananone
alkylated lactone
phthalide
- OXYGENATED ISOMERS
C4H6O
C4H8O
C5H10 O
C6H8O
C6H10 O
C4H6O2
C6H12 O
C7H10 O
C7H14 O2
C6H6O2
C6H14 O2
C6H16 O
C7H8O2
C7H10 O2
C9H18 O
C8H6O2
C10H12 O2
C10H14 O
C10H16 O
C10H18 O
C10H20 O
C10H22O
C9H8O2
C11H20O
- ALCOHOLS
methanol
isoproponal
2-methyl-2-propanol
n-proponal
1-butanol
1-pentanol
x-furfuryl alcohol
2-ethyl-1-hexanol phenol
2,2,4-trimethylpenta-1,3-diol
x-terpineol
- ACIDS
acetic acid
decanoic acid
- SULFUR COMPOUNDS
sulfur dioxide
carbon disulfide
dimethyl disulfide
carbonyl sulfide
- NITROGEN COMPOUNDS
nitromethane
methyl acetamide
benzonitrile
methyl cinnoline
- ESTERS
vinyl propionate
ethyl acetate
ethyl-n-caproate
isoamyl formate
- ETHERS
dimethyl ether
dihydropyran
- EPOXIDE
1,8-cineole
- FURANS
furan
tetrahydrofuran
methyl furan
methyl tetrahydrofuran
ethylfuran
dimethylfuran
2-vinylfuran
furaldehyde
2-n-butylfuran
2-pentylfuran
methylfuraldehyde
furyl methyl ketone
benzofuran
- ALKANES
13 in the group
- ALKENES
11 in the group
isoprene
- ALKYNES
7 in the group
- CYCLIC
cyclopentane
methyl cyclopentane
cyclohexane
C10H14 isomers
C10H16 isomers
limonene
methyl decalin
x-pinene
campene
camphor
e. methyl cyclohexane
- AROMATICS
benzene toluene
ethylbenzene
xylene
phenyl acetylene
styrene
benzaldehyde
methyl styrene
dimethyl styrene
C5-alkylbenzene isomers
napthalene
C6-alkylbenzene isomers
C3-alkylbenzene isomers
C4-alkylbenzene isomers

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In a sustainable society, nature is not subject to systematically increasing:

…concentrations of substances produced by society;

System Condition 2

the Natural Step

In a sustainable society, nature is not subject to systematically Increasing concentrations of substances produced by society.

This means systematically reducing dependence on synthetic compounds known, or suspected to be, harmful to living systems.

• HALOGENATED COMPOUNDS
chlorodifluoromethane
chlorotrifluromethane
dichlorofluoromethane
chloromethane
trichlorofluoromethane
dichloroethylene
Freon 113
methylene chloride
chloroform
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carbon tetrachloride
trichloroethylene
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dibromochloromethane
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n-hexanal
furaldehyde
n-heptanal
benzaldehyde
n-octanal
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2-heptanone
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furyl methyl ketone
octanone
acetaphenone
2-nonanone
2-decananone
alkylated lactone
phthalide
• OXYGENATED ISOMERS
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C4H8O
C5H10 O
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C6H10 O
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C6H12 O
C7H10 O
C7H14 O2
C6H6O2
C6H14 O2
C6H16 O
C7H8O2
C7H10 O2
C9H18 O
C8H6O2
C10H12 O2
C10H14 O
C10H16 O
C10H18 O
C10H20 O
C10H22O
C9H8O2
C11H20O
• ALCOHOLS
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isoproponal
2-methyl-2-propanol
n-proponal
1-butanol
1-pentanol
x-furfuryl alcohol
2-ethyl-1-hexanol phenol
2,2,4-trimethylpenta-1,3-diol
x-terpineol
• ACIDS
acetic acid
decanoic acid
• SULFUR COMPOUNDS
sulfur dioxide
carbon disulfide
dimethyl disulfide
carbonyl sulfide
• NITROGEN COMPOUNDS
nitromethane
methyl acetamide
benzonitrile
methyl cinnoline
• ESTERS
vinyl propionate
ethyl acetate
ethyl-n-caproate
isoamyl formate
• ETHERS
dimethyl ether
dihydropyran
• EPOXIDE
1,8-cineole
• FURANS
furan
tetrahydrofuran
methyl furan
methyl tetrahydrofuran
ethylfuran
dimethylfuran
2-vinylfuran
furaldehyde
2-n-butylfuran
2-pentylfuran
methylfuraldehyde
furyl methyl ketone
benzofuran
• ALKANES
13 in the group
• ALKENES
11 in the group
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• ALKYNES
7 in the group
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cyclopentane
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cyclohexane
C10H14 isomers
C10H16 isomers
limonene
methyl decalin
x-pinene
campene
camphor
e. methyl cyclohexane
• AROMATICS
benzene toluene
ethylbenzene
xylene
phenyl acetylene
styrene
benzaldehyde
methyl styrene
dimethyl styrene
C5-alkylbenzene isomers
napthalene
C6-alkylbenzene isomers
C3-alkylbenzene isomers
C4-alkylbenzene isomers

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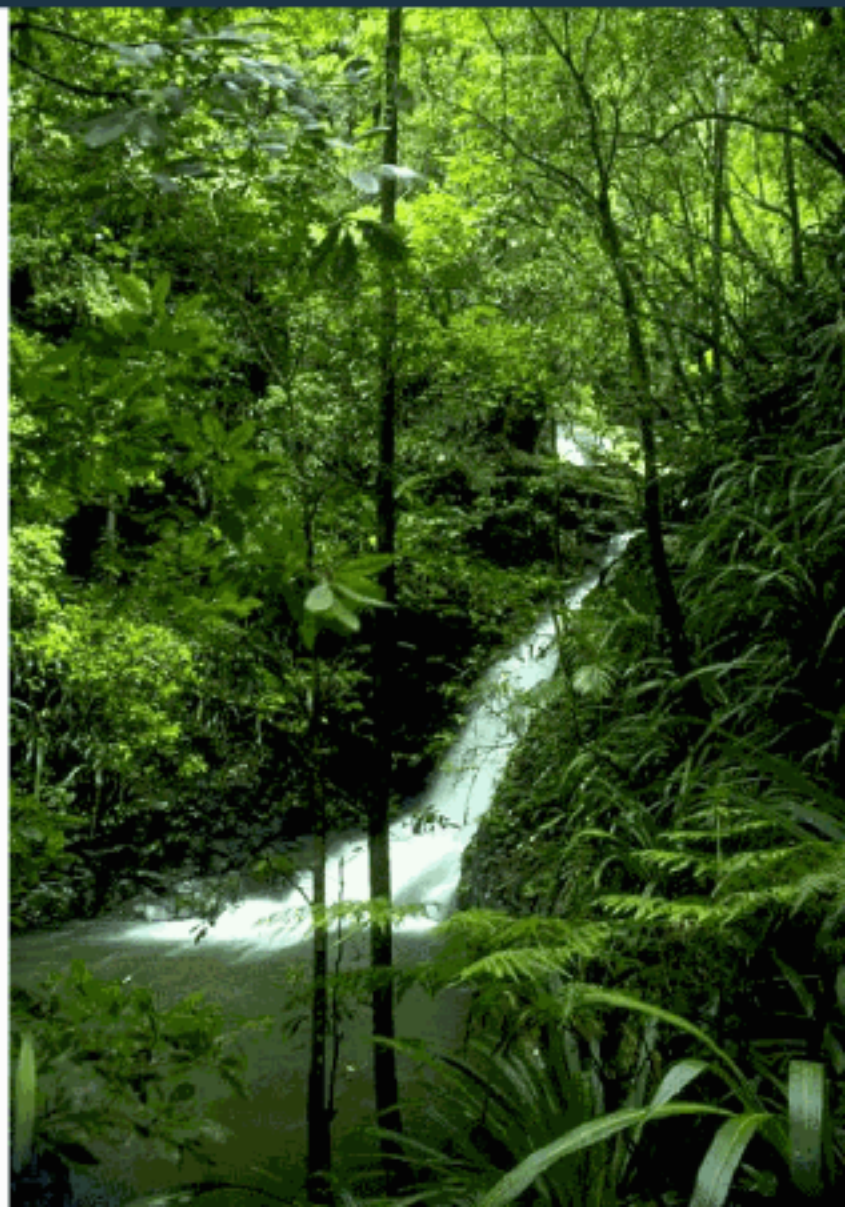
System Condition 3

the NATURAL STEP

In a sustainable society, nature is not subject to increasing:

… degradation by physical means;

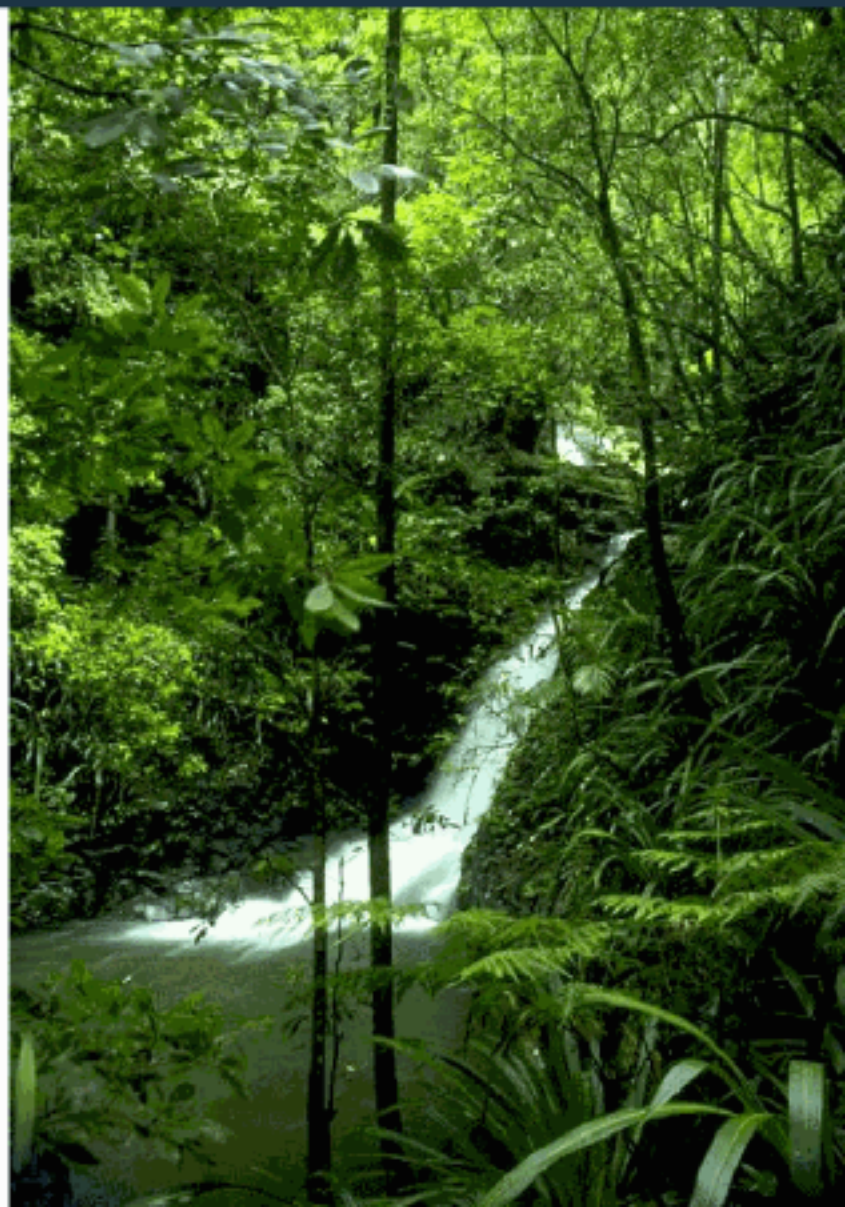


System Condition 3

the NATURAL STEP

In a sustainable society, nature is not subject to increasing degradation by physical means.

This means that in a sustainable society, the productive surfaces of nature are not diminished in quality or quantity, and we must not harvest nature beyond its capacity to regenerate.



System Condition 4

the Natural Step

In a sustainable society:

Basic needs are met worldwide.

System Condition 4

the NATURAL STEP

In a sustainable society the ability of humans to meet their needs is not systematically undermined.

This means using all of our resources efficiently, fairly and responsibly, so that the needs of all people on whom we have an impact, and the future needs of people not yet born, stand the best chance of being met.

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Design Parameters for a Sustainable Society

1. Decrease dependence on fossil fuels and mining, particularly of scarce substances; and if we must use them, keep them in a closed loop and out of the biosphere.

2. Decrease dependence on non-biodegradable or toxic compounds; and if we must use them, keep them in a closed loop and out of the biosphere.

3. Decrease activities that physically destroy or disrupt natural areas or that take resources faster than nature can regenerate.

4. Decrease activities that limit present and future communities in meeting their human needs.

Sustainability Impact Focus Areas

- WATER
  - Quantity
  - Quality
  - Erosion Control
  - Stormwater Management
  - Groundwater Contamination
  - Tourism/Recreational Water Use
  - Agribusiness/Industrial Processes
  - Education/Awareness

Sustainability Impact Focus Areas

- AIR
  - Vehicle Pollution
  - Alternatively Fueled Vehicles
  - Particulate Matter
  - Air Pollution Emission Control Technologies
  - Electric Utilities
  - Education/Awareness

Sustainability Impact Focus Areas

- LAND USE
  - Ecosystem Management
  - Biodiversity Protection
  - Built Environment
  - Smart Growth
  - Open Space
  - Transportation Impacts

Sustainability Impact Focus Areas

- ENERGY
  - Alternative Energy Sources
  - Renewable Energy
  - Energy Conservation

Sustainability Impact Focus Areas

- MATERIALS USE & WASTE
  - Solid Waste
  - Product Selection
  - Recycling and reuse
  - Procurement Policy
  - Waste Reduction

Sustainability Impact Focus Areas

- WATER
  - Quantity
  - Quality
  - Erosion Control
  - Stormwater Management
  - Groundwater Contamination
  - Tourism/Recreational Water Use
  - Agribusiness/Industrial Processes
  - Education/Awareness

Sustainability Impact Focus Areas

- AIR
  - Vehicle Pollution (Off-road, marine, construction)
  - Particulate Matter (2.5/10)
  - Air Pollution Emission Control Technologies
  - Industrial Sources
  - Education/Awareness

Sustainability Impact Focus Areas

- AIR Additions
  - Sewage Waste Treatment Odor
  - Agricultural Odors (Livestock)
  - Atmospheric Deposition (Coal, Boilers, Diesel)
  - Air Quality in Intensive Livestock Operations (Application as fertilizer)
  - Non-local sources of pollution
  - Pesticide/Herbicide application
  - Criteria Pollutants Harmful to Health
  - HAPs Harmful to Health
  - Public Transit
  - Water Stagnation
  - Visibility

Sustainability Impact Focus Areas

- LAND USE
  - Ecosystem Management
  - Biodiversity Protection
  - Built Environment
  - Smart Growth
  - Open Space
  - Transportation Impacts

Sustainability Impact Focus Areas

- ENERGY
  - Alternative Energy Sources
  - Renewable Energy
  - Energy Conservation

Sustainability Impact Focus Areas

- MATERIALS USE & WASTE
  - Solid Waste
  - Product Selection
  - Recycling and reuse
  - Procurement Policy
  - Waste Reduction

Sustainability Impact Focus Area:

Team Members:

Current Reality:

Strategy #1:
Five Year Objective:

Strategy #2:
Five Year Objective:

Strategy #3:
Five Year Objective:

End state

Current Realities

- Uneven distribution and lack of adequate resources for regional planning and local implementation
- No cohesive vision for region, lack of regional plans that integrate protection of land, air, water (floodplains, public open space, stormwater, wetlands, soil, groundwater)
- No centrally coordinated region-wide framework for decision-making
- Wasteful land use practices
- Limited Redevelopment and too much new development -- “urban sprawl”
- Too much dependency on vehicles that leads to poor air quality, lack of alternatives
- Increasing degradation, fragmentation, or destruction of quality habitat (Loss of farmland, Forests, wetlands) Lack of a regionally coordinated infrastructure plan - implementation, maintenance and replacement of phone, cable, electric, sewer, septage, water, natural gas, transportation system

Strategies and Objectives

STRATEGY ONE

Establish a program to analyze and report the current and future land use conditions, policies, laws, and practices that affect sustainability in the Sandhills.

•Develop and maintain a database that contains GIS layers, policies, environmental information, laws, public perceptions and other information pertinent to land use sustainability.

2. Develop indicators, tools, and milestones to measure progress towards achieving sustainable land use in the Sandhills region.

Desired End State

In a Sustainable Sandhills, land use:
Is the intentional harmonious integration of the natural and built environment ensuring environmental integrity and supporting a flourishing economy, vibrant communities and a high quality of life.

Group Team Members

Sustainability Impact Focus Area:

Team Members:

Current Reality:

Strategy #1:
Five Year Objective:

Strategy #2:
Five Year Objective:

Strategy #3:
Five Year Objective:

End state

Sustainability Impact Focus Area:

Team Members:

Current Reality:

Strategy #1:
Five Year Objective:

Strategy #2:
Five Year Objective:

Strategy #3:
Five Year Objective:

End state

CREATING FIVE-YEAR OBJECTIVES (5 hours including lunch)

Activity:

Group develops and prioritizes 1-3 objectives for each strategy (up to 3 strategies).

SUSTAINABILITY IS A TEAM SPORT

1) Discuss the elements of objectives on previous slide (10 minutes)

2) Participants work in pairs (if you have an uneven number, one group works as a group of three). Each pair looks at each strategy and comes up with one objective for that strategy. The objective should be framed in the present, for example, "in/by 2008, _____who_____ is/has _____what/how much_____". (Worksheet on next slide).

3) Each team fills in the "Five Year Objective" template for each strategy (a total of 3 templates). (Slide after the next one). (15 minutes total for work 2&3)

4) Teams present their objectives. Start with one strategy. Have one team give its objective. Others ask clarifying questions to ensure that everyone understands the objective. Then the facilitator asks if any other team has a similar objective so that you can cluster as you go along. Be certain that you take the time to ensure that everyone understands each objective.
5) Keep going around until you have all objectives presented and clustered. (35 minutes for 4&5)
6) Ask participants to think about these objectives over lunch and inform them that the first thing you are going to do after lunch is to see if there are any obvious gaps. (If you are not able to complete the presentation/discussion/and clustering of objectives, continue that after lunch and then do a gap analysis. You can still ask participants to think about this during lunch).

Five Year Objectives:Worksheet

By 2008, (who)

has/is (what)

by (how much)

Sustainability Impact Focus Area:

Team Members:

Current Reality:

Strategy #1:
Five Year Objective:

Strategy #2:
Five Year Objective:

Strategy #3:
Five Year Objective:

End state

Sustainable Sandhills Air Quality

Strategies

Current Realities

#1 - Air quality awareness campaign
#2 - Sustainable transportation
#3 - Create and preserve more greenspace
#4 - Coordinated economic development groups

To "AIR" is human

Strategy

Air quality awareness campaign

Realities

Odor
Ozone
Heavy Metals
Particulates
Asthma

Five Year Objectives:

- Annual Sandhills air quality conference
- Sandhills sustainability web site
- Sustainability educational materials

Excellent Health

Strategy

Sustainable transportation

Realities

Congestion
Smog
Pollution
Infrastructure

Five Year Objectives:

- Public fleets 100% alternatively-fueled
- Interactive, online carpool and commuting information database
- Extensive greenways, pedestrian-friendly development, bike paths, and mass transit

Green Transportation Choices

Realities

Population Growth

Pesticides

Few Standards

Strategy

Create and preserve more greenspace

Five Year Objectives:

- Local/regional greenspace plans
- Pesticide-free public land maintenance

Preservation Of Natural Resources

Realities

Fragmentation
Job Loss
Culture
Buy-In
Funding

Strategy

Coordinated economic development groups

Five Year Objective:

DCA facilitates all Sandhills Economic Development Groups in a Sustainable Economic Alliance

Thriving Economy