Sustainable Landscaping

Sustainable Landscaping

Reduce/ prevent pollution

Conserve natural resources

Maximize ecological function

Look attractive

Presidential Memorandum

- For federal grounds, federal projects, and federally funded projects
- Use regionally native plants for landscaping
- Prevent pollution ⇒ reduce fertilizer and pesticide use, recycle green waste, and minimize runoff

59 Fed. Reg. No 161, pg. 43122 (1994)

Executive Order 13148
Greening the Government through Leadership in Environmental Management

Sustainably manage Federal facilities lands

Implement cost-effective, environmentally sound landscape practices

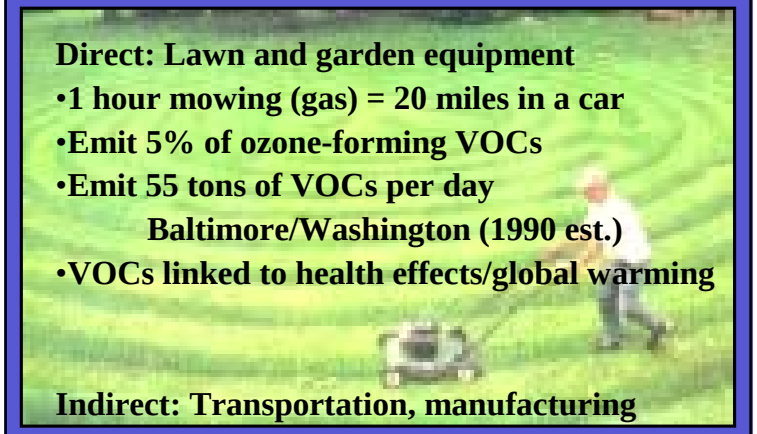
Reduce adverse impacts to the natural environment

65 Fed. Reg. No. 81, pg. 24603 (2000)

Environmental Implications

The Hidden Impacts
of Landscaping

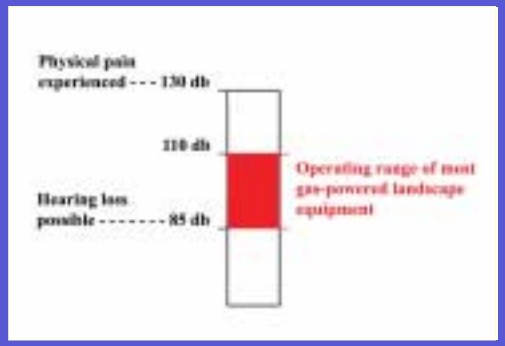
Air Pollution



Direct: Lawn and garden equipment
- 1 hour mowing (gas) = 20 miles in a car
- Emit 5% of ozone-forming VOCs
- Emit 55 tons of VOCs per day
  Baltimore/Washington (1990 est.)
- VOCs linked to health effects/global warming

Indirect: Transportation, manufacturing

Noise Pollution



Water Pollution
Pesticides

- Homeowners use 10X more per acre than farmers
- 67 million lbs applied on lawns each year
- 2/3 users dispose of excess in trash, remainder down drains
- Detectable limits found in 5-10% of wells

Water Pollution Fertilizers

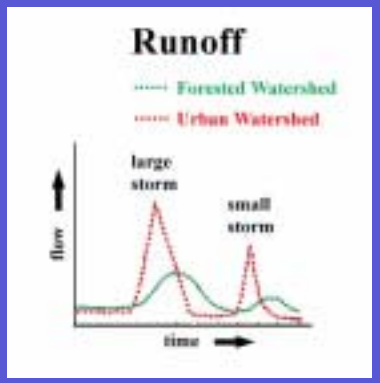
- **40-60% of nitrogen surface and groundwater**
- **Nitrogen, phosphorus main pollutants in Chesapeake Bay**
- **Each Canada goose .4 lbs/yr phosphorus 1.3 lbs/yr nitrogen**


Photo: Britt Slattery, USFWS

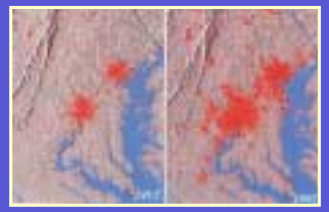

Photo: Chicago Park District

Flood Damage / Erosion

- Lawns only able to absorb 1/10 rainfall of a forest
- Turf has shallow root system; not able to stabilize streambanks
- Runoff results in erosion, flooding, aquatic habitat destruction



Harm To Biodiversity
Habitat Loss



1953 1992

- Traditional development = habitat loss, fragmentation
- 1/4 of all species in world faced with extinction in 50 years
- Exotic plants escape and invade

Harm to Biodiversity
Invasive Ornamental Plants

- *Acer plantanoides* (Norway maple)
- *Pueraria montana* (Kudzu)
- *Lythrum salicaria* (Purple loosestrife)

Photo: Britt Slattery, USFWS

Harm to Biodiversity
Invasive Ornamental Plants

- *Pyrus calleryana 'Bradford'* (Bradford pear)
- *Buddleja* species (Butterfly bush)
- *Berberis thunbergii* (Japanese barberry)

Consumption Of
Natural Resources

Water

- Lawns use 30% in East; 60% in West
- Droughts, water restrictions

Consumption Of Natural Resources

Fossil fuel

- **Mowers use 580 million gallons of gas/year**
- **Dwindling supply, higher costs**

Minerals

Solid Waste

Cost And Labor Intensive

- **$25 billion/year spent on lawn care**
- **1 acre lawn costs $400-700/year to maintain**
- **Average homeowner spends 40 hours/year mowing**

Aesthetics

Implications of Traditional Landscaping

- **Air, Noise, Water Pollution**
- **Flood Damage/Erosion**
- **Harm to Biodiversity**
- **Consumption of Natural Resources**
- **Cost and Labor Intensive**
- **Monotonous Landscapes**

Sustainable Landscaping Principles

- **Requires less maintenance**
- **Reduces environmental harm**
- **Benefits wildlife**
- **Provides seasonal interest**

Naturalistic Design

Photo courtesy of Chicago Park District

Native Plants

- Best adapted to local conditions / thrive with least care
- Great variety of species for all conditions
- Won't harm natural areas
- High habitat value
- Provide "sense of place"

“Wherever I go in America, I like it when the land speaks its own language in its own regional accent.”

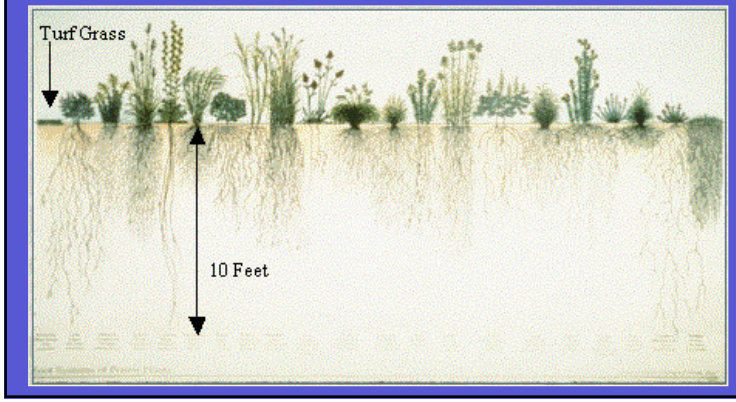
Mrs. Lyndon Johnson, *Wildflowers Across America*, 1993

Right Plant - Right Place

- Assess site conditions
- Select plants that thrive in/under those conditions
- Select plants whose ultimate size, shape fits needs
- Compatible plants / plant communities
- Avoid invasives

Right Plant – Right Place

Native Prairie Plants



Roots Hold Soil

Roots Hold Water

Roof Top Garden

Rain Garden

Storm Water Retention

Reduce runoff

Recharge groundwater

- **Rain gardens**
- **Green roofs**
- **Rain barrels, hardscaping alternatives**

Energy Conservation / Cooling

Trees can lower energy bills by 25%

AC bills - 15-50%
Heating bills - 25-40%

Air temperature up to 25% cooler under tree

Ecological Value

Wildlife needs:

- Food
- Shelter
- Water

Ecological Value

Photo: Jack Pizzo

Ecological Value

Photo: Jack Pizzo

Ecological Value

Photo: Jack Pizzo

Ecological Value

Photo: Jack Pizzo

Maintenance

Integrated Pest Management (IPM)

Practice IPM

- **Monitor and assess**
- **Cultural controls first**
- **Least toxic chemicals**
- **Follow label directions carefully**
- **Spot treat rather than broadcast**

Careful Nutrient Application

- Test soil to determine appropriate fertilizer
- Use organics and slow-release
- Apply sparingly and at correct time, according to directions
- Little to none needed for natives

Water Conservation

Use less water
- Assess need
- Use water saving devices
- Water early in the day
- Use drought tolerant plants

Retain water
- Use mulch
- Capture runoff (rain barrels/gardens)

Energy Conservation

Where feasible:
- Electric tools rather than gas tools
- 4-cycle engines rather than 2-cycle
- Keep power tools well-tuned

Composting / Mulching

- Compost organic matter on site
- Save on disposal fees, landfill space, transportation impacts
- Create free compost for soil amendment
- GreenScapes program for large sites

Sustainable Landscaping Principles

- Naturalistic Design
- Native Plants Hold Soil, Water
- Right Plant - Right Place
- Storm Water Retention
- Energy Conservation / Cooling
- Ecological Value

Maintenance

- Integrated Pest Management
- Careful Application of Nutrients
- Water Conservation
- Energy Conservation
- Composting / Mulching

Contact Us

Dan Welker
US EPA, Region 3
215-814-2744
welker.dan@epa.gov
www.epa.gov/reg3esd1/garden

Danielle Green
US EPA, Great Lakes National Program
312-886-7594
green.danielle@epa.gov
www.epa.gov/greenacres/