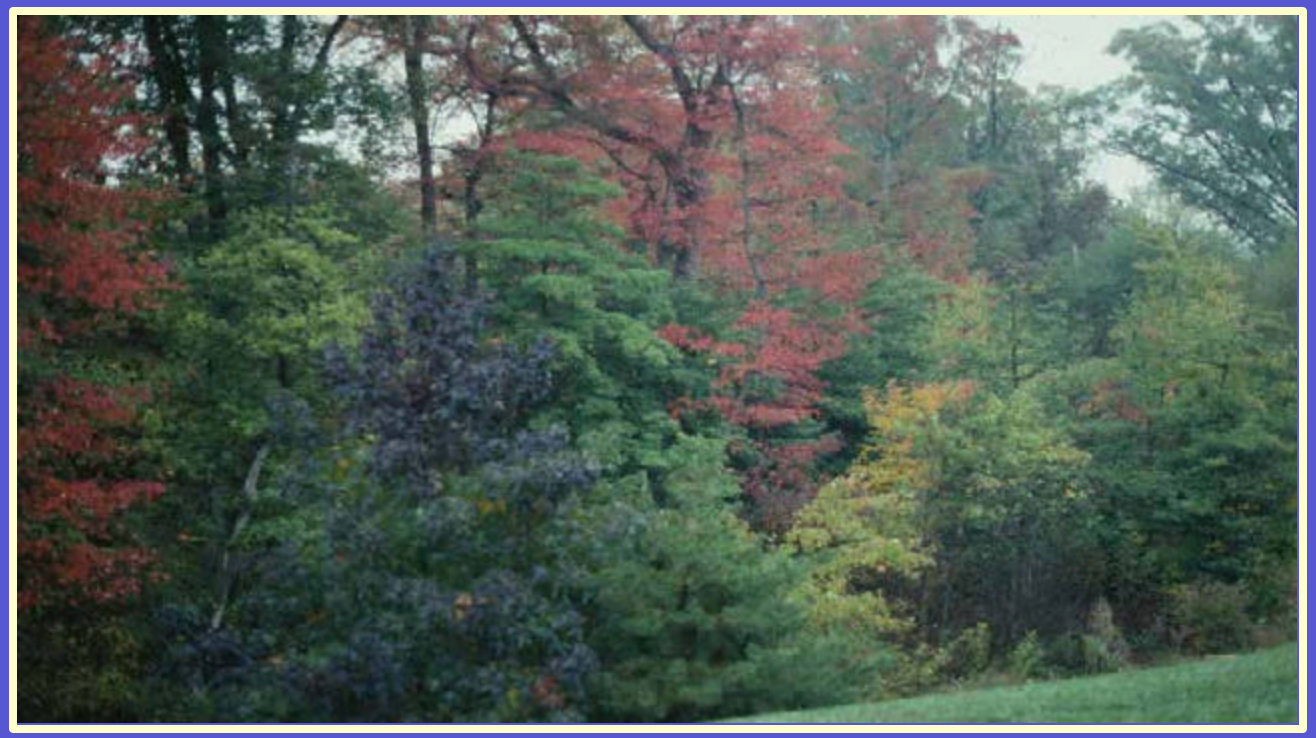
Sustainable Landscaping



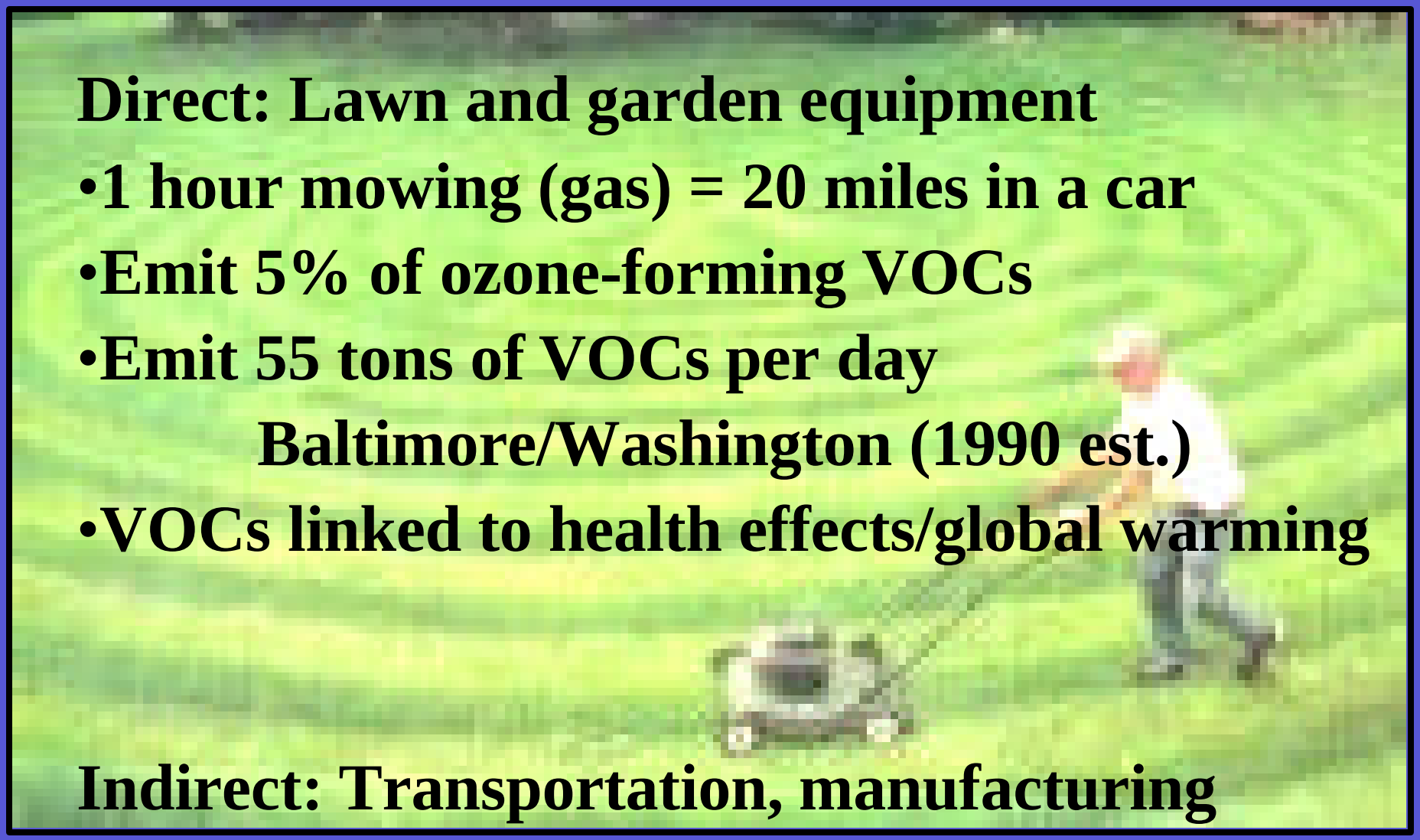
Sustainable Landscaping

- Reduce/ prevent pollution
- Conserve natural resources
- Maximize ecological function
- Look attractive

Environmental Implications

The Hidden Impacts of Gardens

Air Pollution



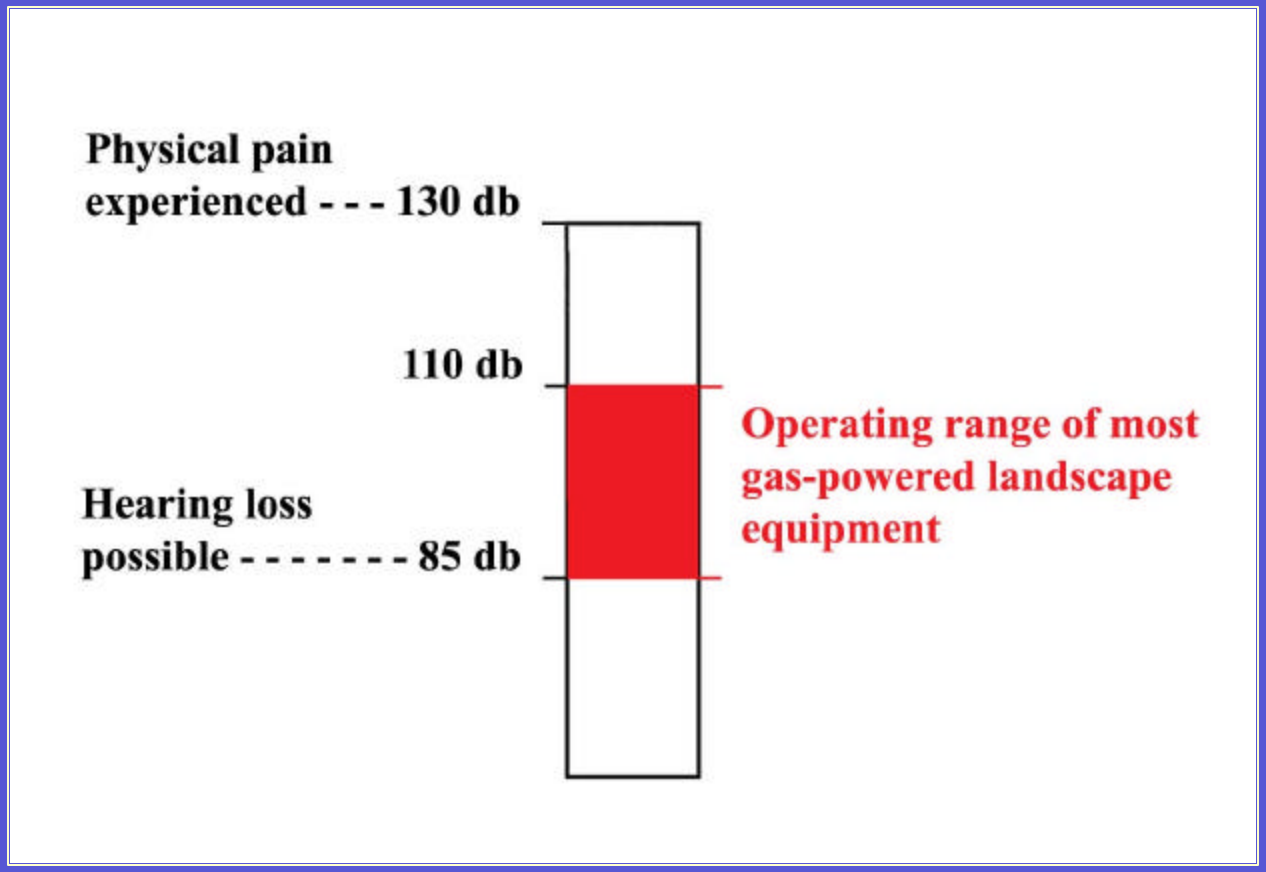
Direct: Lawn and garden equipment

- **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**

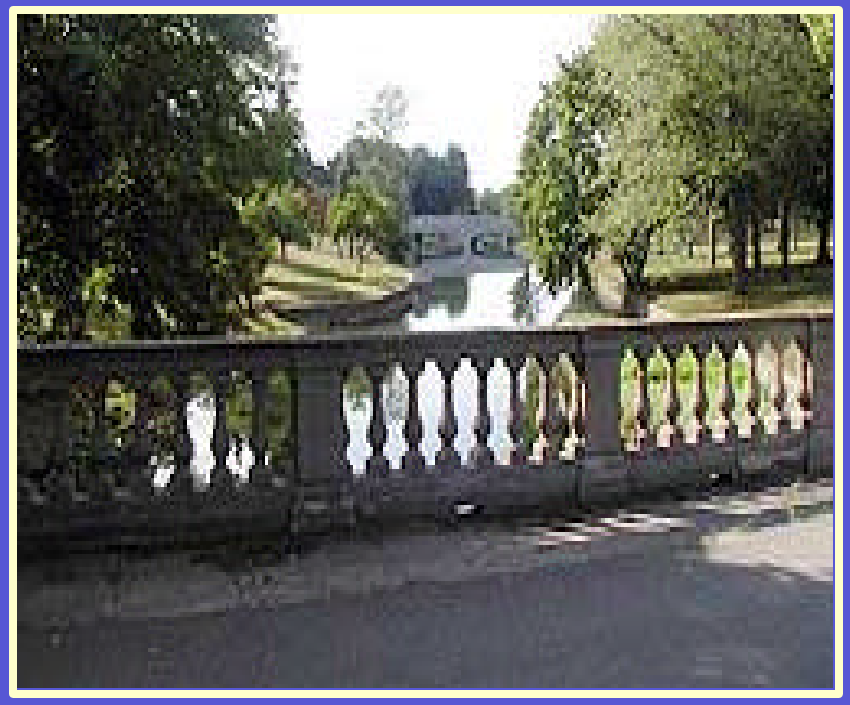
Indirect: Transportation, manufacturing

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

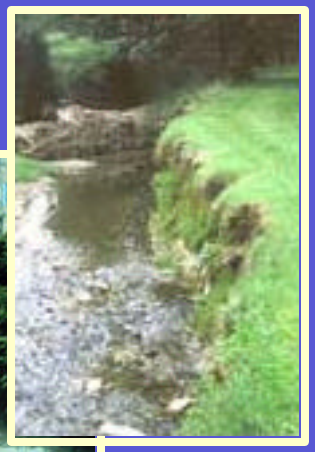
- 40-60% of nitrogen surface and groundwater
- Nitrogen, phosphorus main pollutants in Chesapeake Bay
- Each Canada goose
  - .4 lbs/yr phosphorus
  - 1.3 lbs/yr nitrogen

Photo: Britt Slattery, USFWS


Photo: Chicago Park District

Flood Damage / Erosion

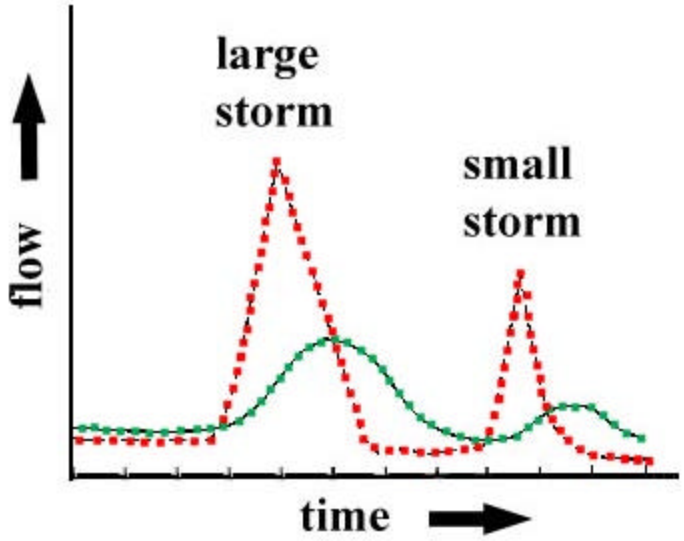
- Lawns only able to absorb 1/10 rainfall of a forest
- Turf has shallow root system; not able to stabilize streambanks
- Runoff results in erosion, flooding, aquatic habitat destruction



Runoff

Forested Watershed

Urban Watershed

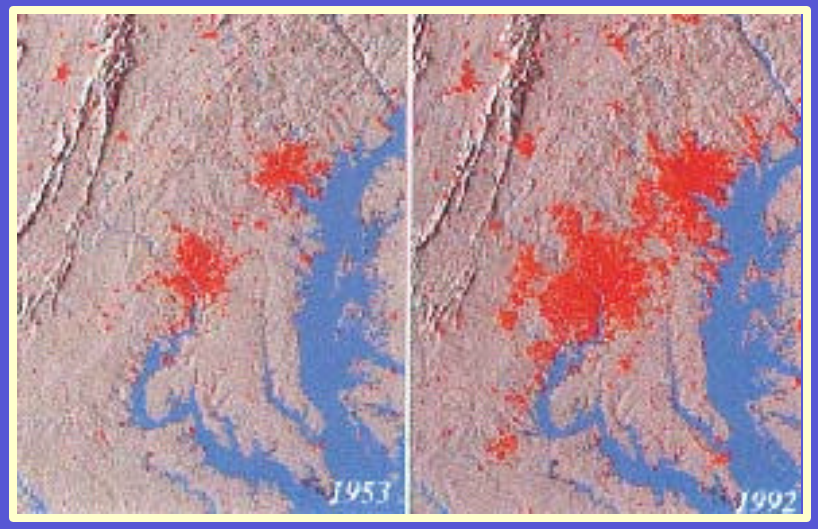


Harm To Biodiversity Pesticides

Photo: Britt Slattery, USFWS

- 67 million lbs applied to lawns/year
- 60-70 million birds poisoned/year (US)
- >1% of the half-million plant and animal species considered pests (US)
- Beneficial species inadvertent targets of pesticides

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

Invasive Plants Originally Ornamentals

- *Acer plantanoides*

  (Norway maple)

- *Pueraria montana*

  (Kudzu)

- *Lythrum salicaria*

  (Purple loosestrife)

Invasive Plants Originally Ornamentals

- *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

Impacts To Public Health And Safety

Photo: Britt Slattery, USFWS

Poisoning

- 50-74% don't store pesticides safely
- 50% don't read /follow pesticide labels
- 110,000 sickened by pesticides/yr (US), 3 million world-wide

Accidents

- 75,000/yr require ER treatment for mower injuries

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**
- **Impacts to Public Health and Safety**
- **Cost and Labor Intensive**
- **Monotonous Landscapes**

Sustainable Landscaping Principles

- Design
- Maintenance

Naturalistic Design

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

Naturalistic Design

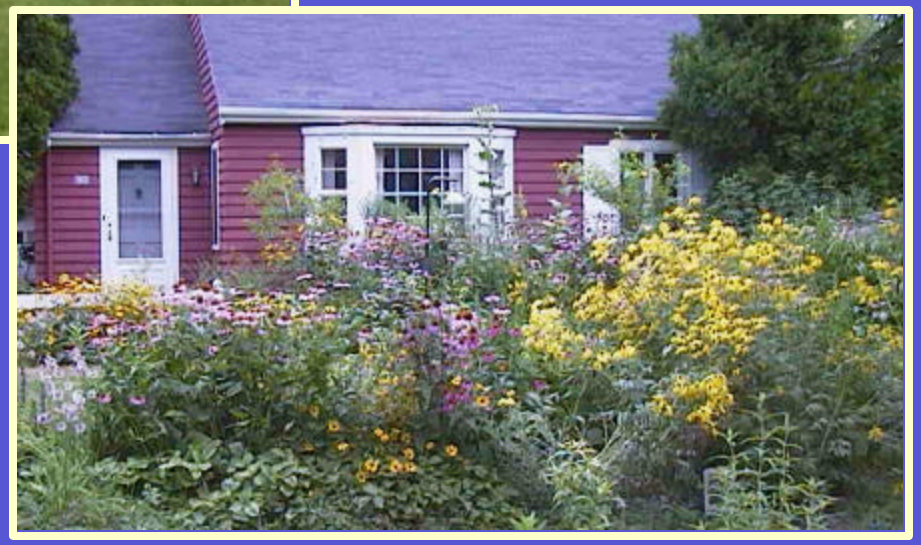



Photo courtesy of Chicago Park District


STOP

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.”

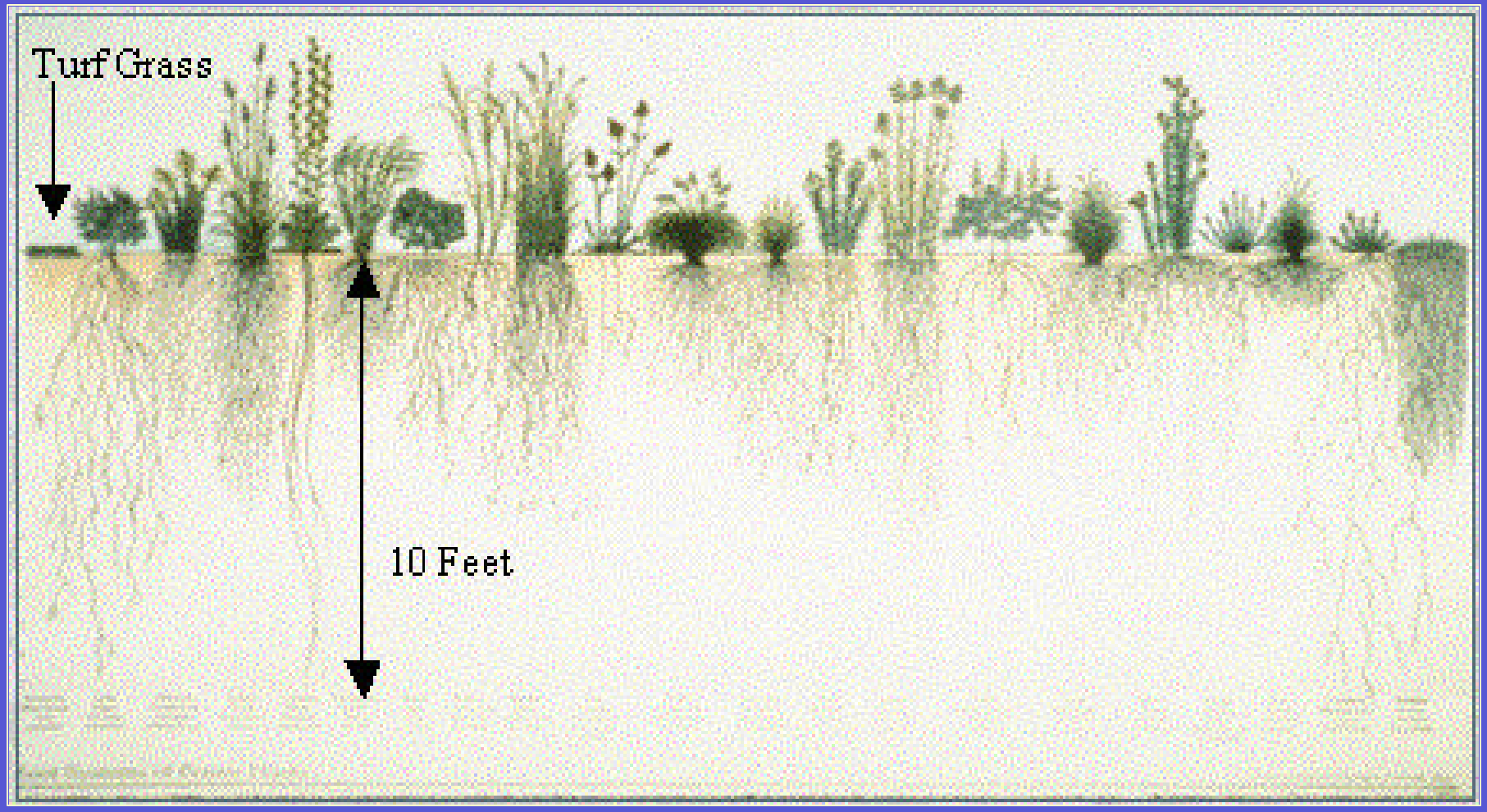
Mrs. Lyndon Johnson, *Wildflowers Across America*, 1993

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

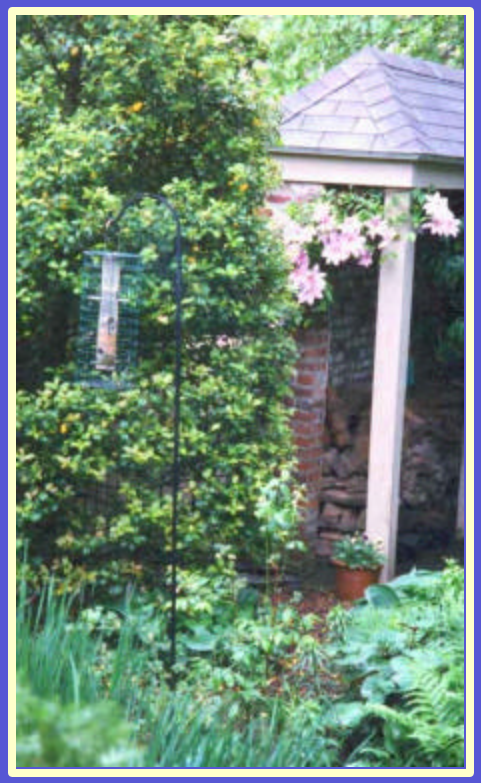
Roots Hold Water

Photo: Pat Armstrong, Prairie Sun Consultants

Plant for the Long Term

- Perennials vs annual
- Longer lived over shorter
- Reduce cost and transportation impacts from replacement

Diversity And Biomass



Use greatest diversity of plants

- **More seasonal interest**
- **Less noticeable damage fom pests and disease**
- **More wildlife habitat**

Plant sites more densely, in layers

- **Better water retention**
- **Greater air quality benefits**
- **More cooling ability**

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

Storm Water Retention

Reduce runoff

Recharge groundwater

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

Roof Top Garden

Rain Garden

Ecological Value

Wildlife needs:

- **Food**
- **Shelter**
- **Water**

Ecological Value

Ecological Value

Ecological Value

Ecological Value

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

Garden Pollution Affects Our Streams

Have you ever used garden fertilizers, killed weeds with chemicals, or sprayed for pesky bugs?

If you improve your gardening practices, you can help clean polluted streams.

Garden pollution washes into the gutter, down the storm drain and into the nearest stream, which may supply your community's drinking water.

Bare soil patches allow loose soil to be carried by run-off into streams.

Cover bare spots with plants or mulch.

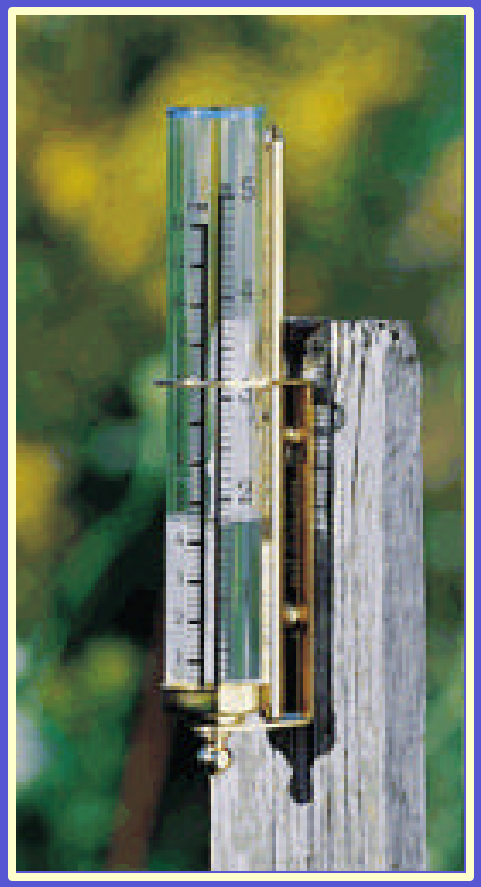
Run-off carries grass clippings and yard waste into our streams. Excess nitrogen and phosphorous from fertilizers and decomposing plants cause algae to grow.

Minimize fertilizer use.

Pesticides and herbicides wash into local streams.

Use biodegradable bug killers

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:

- **Use hand tools rather than power tools**
- **Electric tools rather than gas tools**
- **4-cycle engines rather than 2-cycle**
- **Keep power tools well-tuned**
- **Consider indirect impacts**

Composting / Mulching

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

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
- 65 Fed. Reg. No. 81, pg. 24603

Sustainable Landscaping Principles

- Naturalistic Design
- Native Plants Hold Soil, Water
- Right Plant - Right Place
- Plant for the Long Term
- Diversity and Biomass
- Energy Conservation / Cooling
- Storm Water Retention
- Ecological Value

Maintenance

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

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