

## **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



### **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 Pesticides



- 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

#### **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









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









## **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**



## **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



#### Wildlife needs:

- Food
- Shelter
- Water













#### 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.

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

Cover bare spats with plants or mulch.

### 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

#### **Contact Us**

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