

Sewage Lagoons for Recreation and Habitat



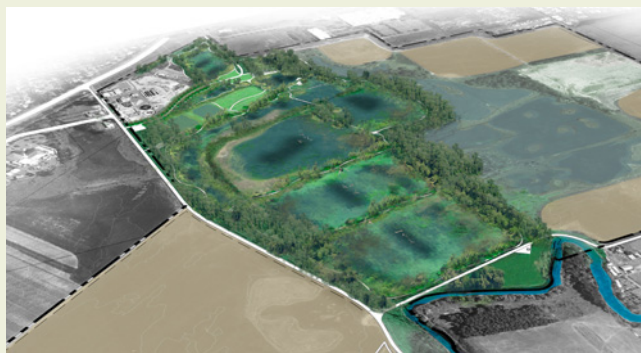
Wetlands survey, Russel Creek basin
US Geological Survey / Fish & Wildlife Service

Some examples. . .

Fernhill Wetlands – Forest Grove, Oregon



Figure 1: Overview Plan



Master plan by GreenWorks, Portland



- Treatment wetlands, part of Forest Grove Wastewater Treatment Facility.

Fernhill Wetlands – Forest Grove, Oregon

- Wetlands cleanse wastewater
- Wetlands and shade plants lower water temperature



FIGURE 5-1
Forest Grove Wastewater Treatment Facility Natural Treatment System

Engineering by CH2MHill, Corvallis



Treatment channel under construction

Fernhill Wetlands – Forest Grove, Oregon

- Waterfalls oxygenate water



Under construction
Design by Hoichi Kurisu



Under construction

Fernhill Wetlands – Forest Grove, Oregon

- Habitat
- Popular birdwatching site



Fernhill Wetlands – Forest Grove, Oregon

- Recreation and community





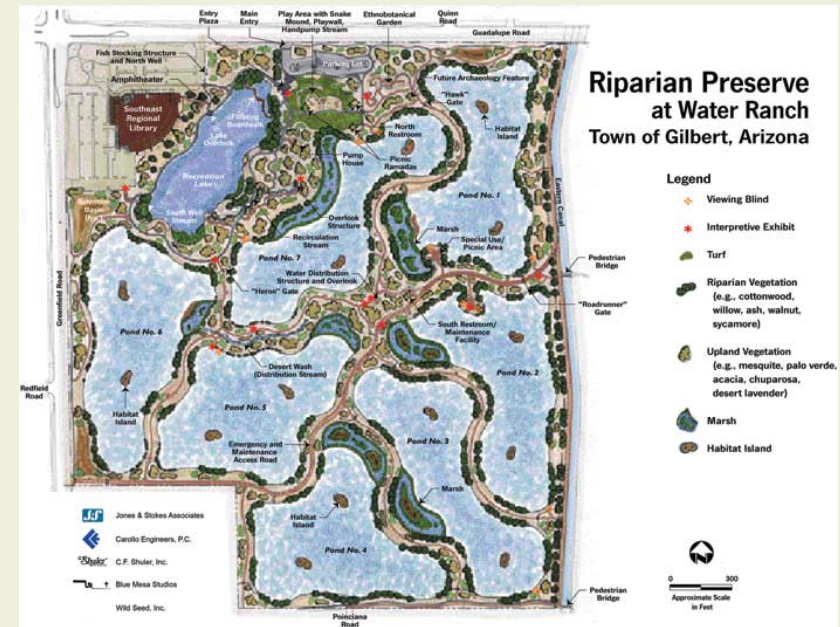
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This slide is used as a divider between sections.

Riparian Preserve – Gilbert, Arizona

(former 70-acre cornfield)

- Tertiary wastewater treatment
 - 4 million gallons / day
- Groundwater recharge
 - Water table rose 40 ft in 20 years



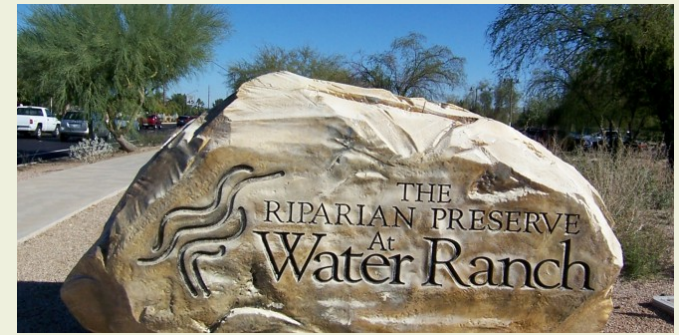
Riparian Preserve – Gilbert, Arizona

- Habitat



Riparian Preserve – Gilbert, Arizona

- Recreation and community



Play area



Library



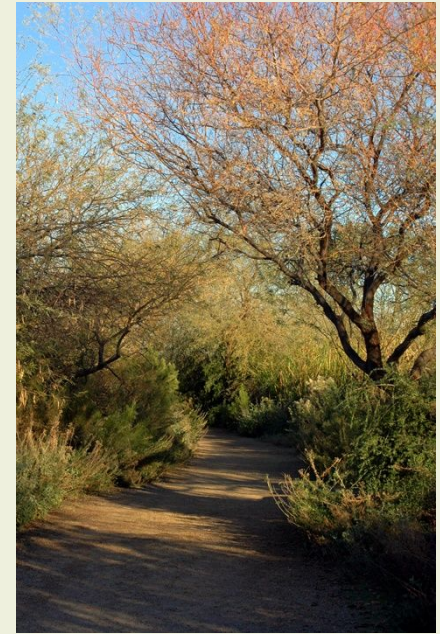
Observatory



Bird-watching blinds and platforms

Riparian Preserve – Gilbert, Arizona

- 4 miles of hiking and walking paths



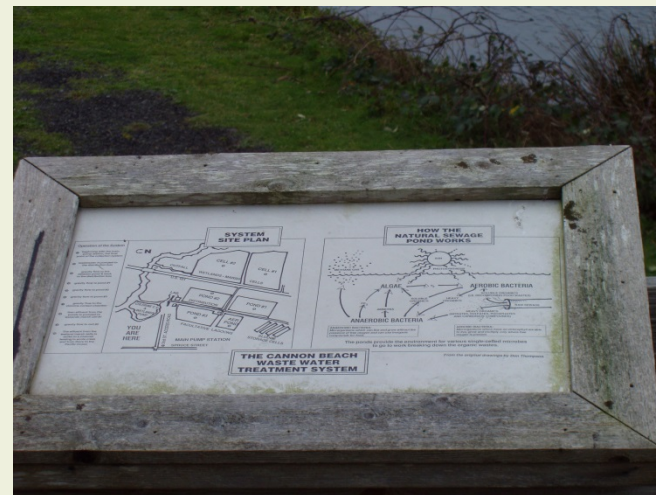


Wetlands survey, Russel Creek basin US Geological Survey / Fish & Wildlife Service

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Treatment wetlands – Cannon Beach, Oregon

- Lagoons + wetlands
- Treats 180 million gallons wastewater / year





Wetlands survey, Russel Creek basin
 US Geological Survey / Fish & Wildlife Service

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Wastewater Treatment Wetlands - Arcata, California

- Secondary treatment in ponds
- Tertiary treatment in wetlands
 - Four wetlands, 6 acres total



Wastewater Treatment Wetlands - Arcata, California

- Habitat
- Community recreation site





Wetlands survey, Russel Creek basin
 US Geological Survey / Fish & Wildlife Service

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Třeboň Biosphere Reserve – Czech Republic

- Manmade ponds 800 years old
 - 66 square miles of wetlands
- People make their livings here.
 - Farming, aquaculture, timber harvesting
- Working landscape that is also a reserve



Třeboň Biosphere Reserve – Czech Republic

- Recreation
 - Canoeing
 - Birdwatching
- Habitat: conservation area with high biodiversity, many rare species
 - 50 species mammals
 - 12 species amphibians
 - 150 species nesting birds





Wetlands survey, Russel Creek basin
 US Geological Survey / Fish & Wildlife Service

This slide is used as a divider between sections.

Reclaimed coal field – Tangshan City, China

- Once highly polluted site for dumping coal waste
- Now largest central park in northern China



Master Plan of Central Park

Reclaimed coal field – Tangshan City, China





Wetlands survey, Russel Creek basin US Geological Survey / Fish & Wildlife Service

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Qinhuangdao Wetland – Qinhuangdao, China

- Degraded wetland was filled with debris
- Now restored habitat



Islands are bird habitat

Qinhuangdao Wetland – Qinhuangdao, China

- Walking paths
- 7 pavilions: education, views
- Bird Museum
- Wetland Museum





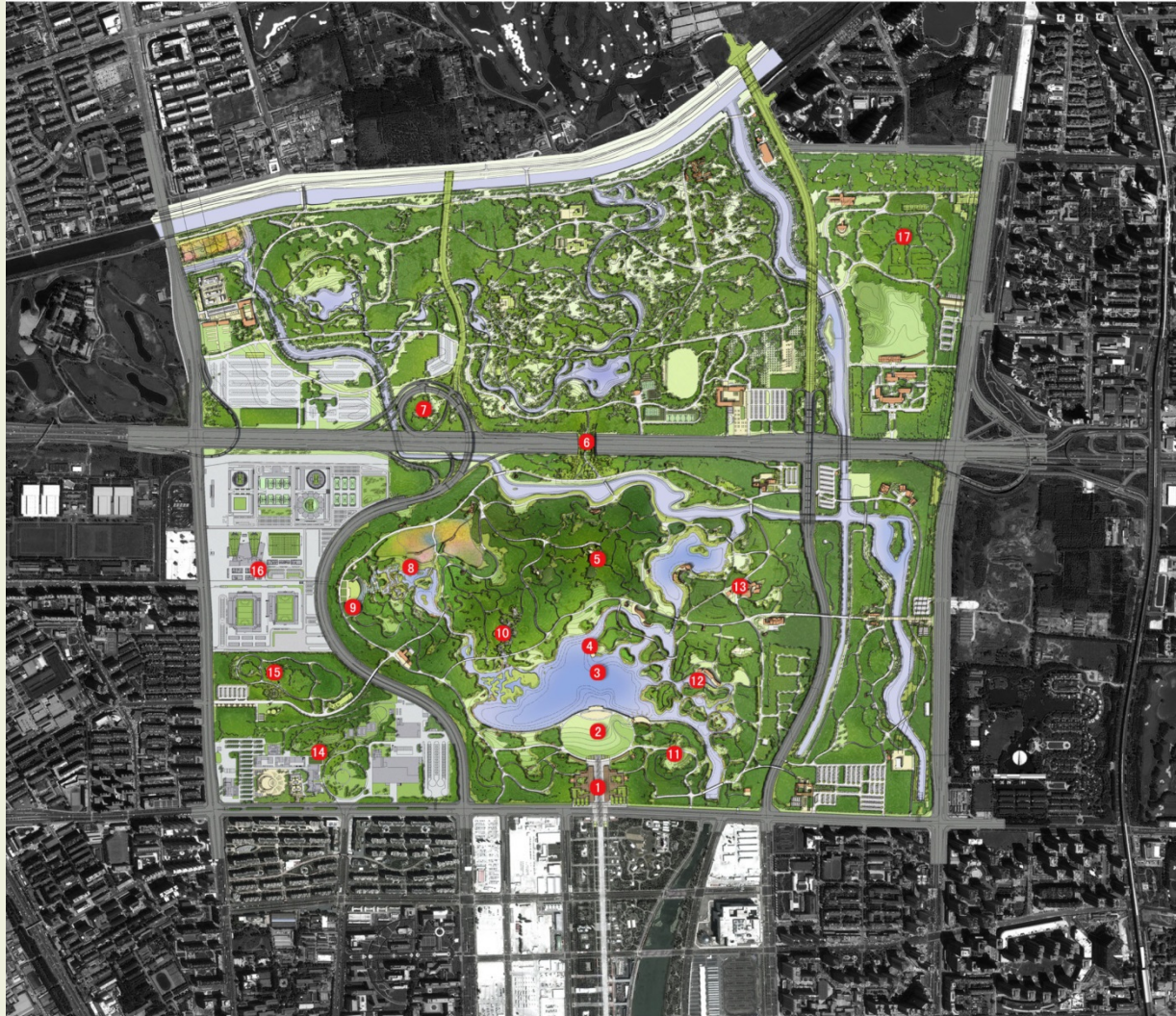
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Olympic Forest Park – Beijing, China



Olympic Forest Park – Beijing, China



- 1 Main Entrance
- 2 Open-Air Theater
- 3 Main Lake *Ao Hai*
- 4 Waterside Platform *Island of Moon*
- 5 Main Mountain
Yang Shan & Land of Heaven Green
- 6 Eco-corridor Bridge
- 7 Traffic Island
- 8 Construction Wetland
- 9 Wetland Greenhouse
- 10 *Brooks Running Down Forests*
- 11 Forest Theater
- 12 Fishing Zone
- 13 Forest Art Center
- 14 International Reception Zone
- 15 Children's Playground
- 16 Tennis Court, Hockey Stadium & Archery Field
- 17 Permanent Sports Field

Olympic Forest Park – Beijing, China

- 4-acre wetland treats graywater, stormwater, floodwater
- Treated water flows to 50-acre lake



Water system

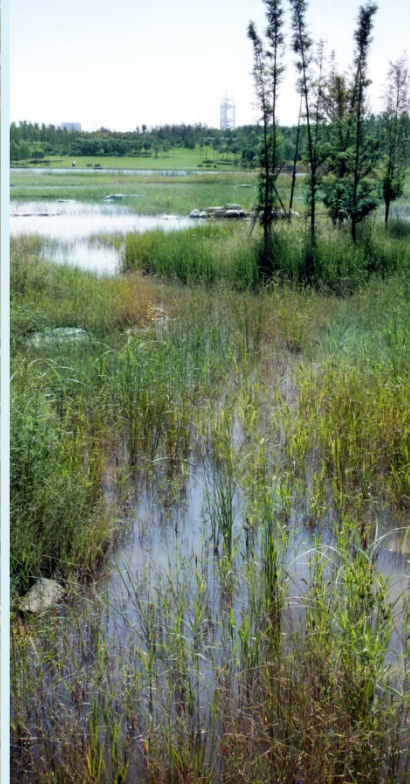
Olympic Forest Park – Beijing, China

- Wetland greenhouse
- Treats 158,000 gallons water / day
- Education center



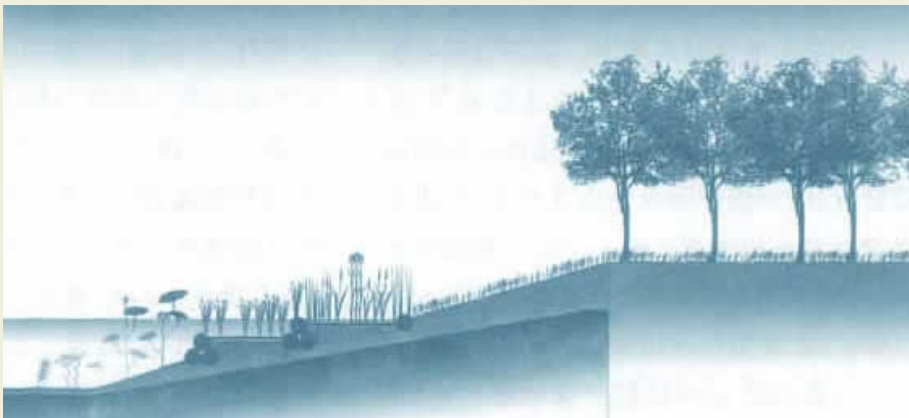
Olympic Forest Park – Beijing, China

- Waterfalls oxygenate water



Olympic Forest Park – Beijing, China

- Landforms built from construction debris
 - (As was landform in Russel Creek basin)



Olympic Forest Park – Beijing, China

- Variety of walking paths. . .



Olympic Forest Park – Beijing, China

- . . . Plus an overpass for wildlife
- And a nesting tower for swifts

