**Biomes and Biodiversity**

**Biomes:** types of ecosystems having similar characteristics  
**Biodiversity:** presence of many, varied types of biological and ecological systems

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**Terrestrial Biomes**

- Deserts  
- Grasslands  
- Tundra  
- Conifer forests  
- Broad-leaved forests  
- Chaparral  
- Tropical Moist Forests  
- Tropical Seasonal Forests

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**Marine Ecosystems**

- Coral reefs  
- Mangrove Forests  
- Estuaries  
- Tide pools

**Freshwater Ecosystems**

- Lakes  
- Wetlands  
- Streams/Rivers

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**Importance of Biodiversity**

- Food sources  
- Drugs/Medicine  
- Environmental Benefits  
  - Pest/parasite control  
  - Soil formation  
  - Air/water purification  
  - Nutrient cycling  
  - Waste disposal

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**Drugs/Medicine**

<table>
<thead>
<tr>
<th>Product</th>
<th>Source</th>
<th>Use</th>
<th>Extraction Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penicillin</td>
<td>Fungus</td>
<td>Antibiotic</td>
<td>Penicillium</td>
</tr>
<tr>
<td>Benzylpenicillin</td>
<td>Bacterium</td>
<td>Antibiotic</td>
<td>Penicillin</td>
</tr>
<tr>
<td>Terramycin</td>
<td>Bacterium</td>
<td>Antibiotic</td>
<td>Terramycin</td>
</tr>
<tr>
<td>Erythromycin</td>
<td>Bacterium</td>
<td>Antibiotic</td>
<td>Erythromycin</td>
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<tr>
<td>Quinones</td>
<td>Fungus</td>
<td>Anti-inflammatory treatment</td>
<td>Quinone</td>
</tr>
<tr>
<td>Cephalosporins</td>
<td>Fungus</td>
<td>Anti-inflammatory treatment</td>
<td>Cephalosporins</td>
</tr>
<tr>
<td>Cortisone</td>
<td>Fungus</td>
<td>Anti-inflammatory treatment</td>
<td>Cortisone</td>
</tr>
<tr>
<td>Cytotoxic</td>
<td>Fungus</td>
<td>Anti-inflammatory treatment</td>
<td>Cytotoxic</td>
</tr>
<tr>
<td>Reserpine</td>
<td>Flavonoid</td>
<td>Anti-inflammatory treatment</td>
<td>Reserpine</td>
</tr>
<tr>
<td>Bee venom</td>
<td>Bee</td>
<td>Anti-inflammatory treatment</td>
<td>Venom</td>
</tr>
<tr>
<td>Allantoin</td>
<td>Stem cells</td>
<td>Wound healer</td>
<td>Allantoin</td>
</tr>
<tr>
<td>Morphine</td>
<td>Poppy</td>
<td>Analgesia</td>
<td>Morphine</td>
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</tbody>
</table>
• Aesthetic and Cultural Benefits

Yosemite

Yellowstone

**Threats to Biodiversity**

**TABLE 5.3**

<table>
<thead>
<tr>
<th>Historic Period</th>
<th>Time (Before Present)</th>
<th>Percent of Species Extinct</th>
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</thead>
<tbody>
<tr>
<td>Ordovician</td>
<td>444 million</td>
<td>85</td>
</tr>
<tr>
<td>Devonian</td>
<td>370 million</td>
<td>83</td>
</tr>
<tr>
<td>Permian</td>
<td>250 million</td>
<td>95</td>
</tr>
<tr>
<td>Triassic</td>
<td>210 million</td>
<td>85</td>
</tr>
<tr>
<td>Cretaceous</td>
<td>65 million</td>
<td>76</td>
</tr>
</tbody>
</table>
| Quaternary      | Present               | 33–66


**Human Impact on Biodiversity**

(HIPPO)

• Habitat destruction
• Invasive species
• Pollution
• Population (human)
• Over-harvesting

**Habitat Loss**

**Invasive Species**

**Pollution**
Over-Harvesting

Human Population

**Tropical Moist Forests**
Wet, warm climate year-round
Extremely rich biodiversity
Deforested for logging, agriculture and mining

**Deserts**
Hot or cold, but little or no rainfall
Plants and animals have special adaptations

Vulnerable to overgrazing, off-road vehicles

**Grasslands and Savannas**

Insufficient rain for forests → open grasslands

**Savanna**: grasslands with some trees

Grasslands have rich soil → farmland

Most grassland prairies in U.S. and Canada are now corn, soybean, wheat crops

Overgrazing → erosion and weeds

**Chaparral**

Hot, dry summer, cool moist winter

Drought-resistant shrubs, trees and grass

"Hot-spot" for biodiversity
**Broad-leaved Forests**

Year-round rainfall, temperate climate

Deciduous trees (lose their leaves seasonally)

Many U.S. forests settled and cut for lumber, firewood, industrial uses

Cleared for farmland

Siberia is deforesting at tremendous rate

Logging removes many coniferous forests

**Coniferous Forests**

Variable rainfall, cold or hot climates

(California redwoods, etc.)

The Sierras

Santa Cruz Mountains
Animals endangered or extinct from loss of habitat

- Spotted Owl
- Marbled Murullet
- Coho Salmon

Tundra
High latitude, cold climate, frost any month
No trees, short growing season (2-3 months)

Arctic tundra

Alpine tundra

Affected by pollution, global warming, drilling

Marine Ecosystems

**Coral reefs**: colonies of tiny animals living with photosynthetic algae

Shallow, clear water

Very biodiverse

Damaged by:
Sewage and other pollution
Destructive fishing (dynamite, cyanide)
Temperature change
Invasive species
**Mangroves:** salt-tolerant trees near warm, calm coasts

- Stabilize shorelines, reduce impact of storms, build land
- Provide food & shelter to marine and terrestrial animals

**Estuaries:** bays where rivers empty into the sea

- Site of spawning, development for many animals

**Tide Pools:** depressions in wave-blasted shorelines

- Vulnerable to sewage and pollution

**Freshwater Ecosystems**

- **Swamps:** wetlands with trees
- **Marshes:** wetlands without trees
- **Bogs:** water-saturated ground with peat
- **Fens:** like bogs but with ground-water

**Wetlands store storm water, reduce flooding**

Filter and purify farm and urban runoff
Wetlands support rich biodiversity
Essential for breeding and migrating birds
1/3 of all endangered species live in wetlands

Protecting Biomes and Biodiversity
• U.S. Endangered species act (1973)
• International Union for Conservation of Nature and Natural Resources (IUCN)

Not all threatened species are protected
Spotted Owl
Snail Darter Fish
Columbia River salmon, steelhead