

Species that Cause Change in the Environment: Beneficial vs. Harmful



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Questions to be answered

- What are some native species that are beneficial to the environment?
- What are some introduced species that are beneficial to the environment?
- What are some native species that are harmful to the environment?
- What are some introduced species that are harmful to the environment?



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Vocabulary

- Species
- Native species
- Introduced species
- Invasive species
- Pests
- Biological control agents
- Predators
- Parasitoids
- Organic matter



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Native species that are beneficial



Sycamore leaf and fruit

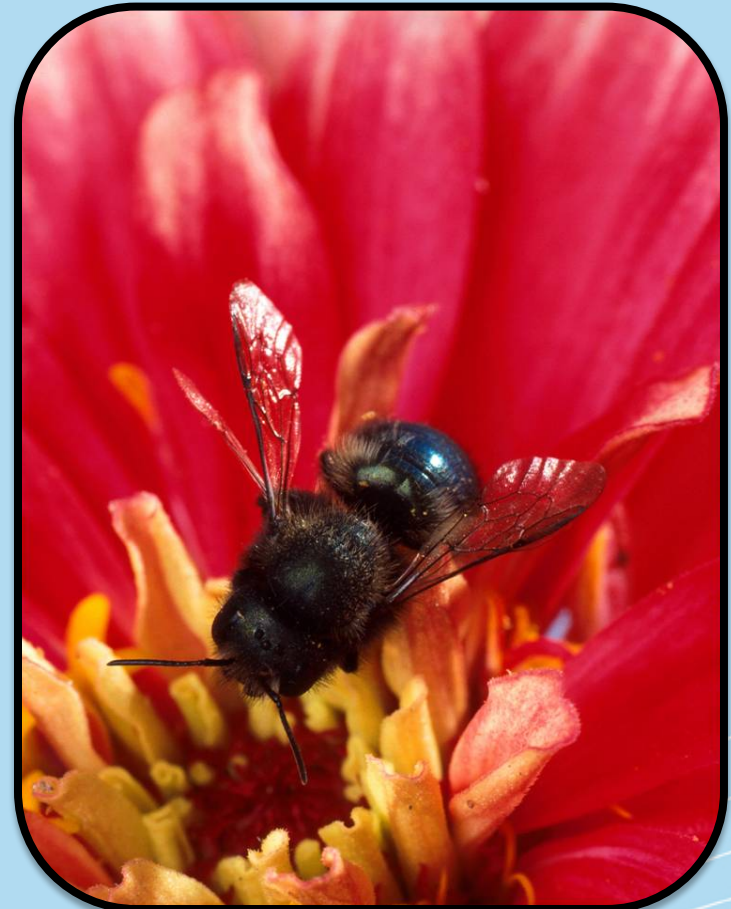
Fungi on a dead log



Native species that are beneficial



Buckeye butterfly



Blue orchard bee

Photo Credits:

Buckeye - William M. Ciesla, Forest Health Management International, www.bugwood.org, #5347009

BOB - Scott Bauer, USDA Agricultural Research Service, www.bugwood.org, #1323039



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Introduced species that are beneficial

Night crawler



European honeybee

Photo Credits:
Earthworm - Joseph Berger, www.bugwood.org, #5439087
Honeybee- David Cappaert, Michigan State University, www.bugwood.org, #2116051



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Introduced species that are beneficial

Asian ladybird beetle



Parasitoid wasp



Photo Credits:
Ladybird beetles - Gyorgy Csoka, Hungary Forest Research Institute, www.bugwood.org, #5410810
Bald eagle - David Cappaert, Michigan State University, www.bugwood.org, #2133029



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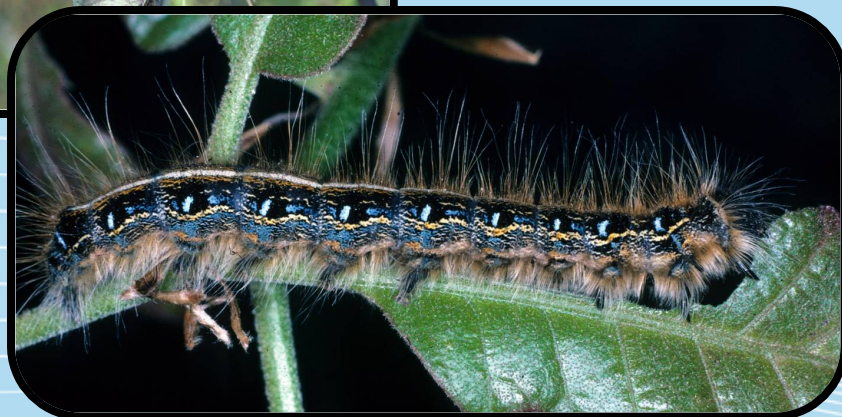
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Native species that are harmful



Eastern tent caterpillars in their tent

Eastern tent caterpillar



Damage caused by southern pine beetles



Southern pine beetle

Photo Credits:
Tent caterpillars - Lacy L. Hyche, Auburn University, www.bugwood.org, #1540417 and Robert L. Anderson, USDA Forest Service, www.bugwood.org, #0590064
Southern pine beetle - Ronald F. Billings, Texas Forest Service, www.bugwood.org, #1546017 and Erich G. Vallery, USDA Forest Service - SRS-4552, www.bugwood.org, #5289035



Introduced species that are harmful

Damage caused by emerald ash borer



Emerald ash borer adult and larva



Galleries left by the larva



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Photo Credit:

Damaged ash trees: Daniel Herms, The Ohio State University, www.bugwood.org, #5171038

Beetle: David Cappaert, Michigan State University, www.bugwood.org, #2106098

Larvae: David Cappaert, Michigan State University, www.bugwood.org, # 1460071

Tunnels: Art Wagner, USDA APHIS PPQ, www.bugwood.org, #5147090

Introduced species that are harmful

Destruction of trees infested by Asian
longhorned beetle



Asian
longhorned
beetle adult
and larva



Larva inside
the wood



Photo Credit:
Chipping trees: Larry R. Barber, USDA Forest Service, www.bugwood.org, #3047034
Beetle: Michael Bohne, www.bugwood.org, #1262001
Larvae: Thomas B. Denholm, New Jersey Department of Agriculture, www.bugwood.org, #1253027
Tunnels: Steven Katovich, USDA Forest Service, www.bugwood.org, #1398111



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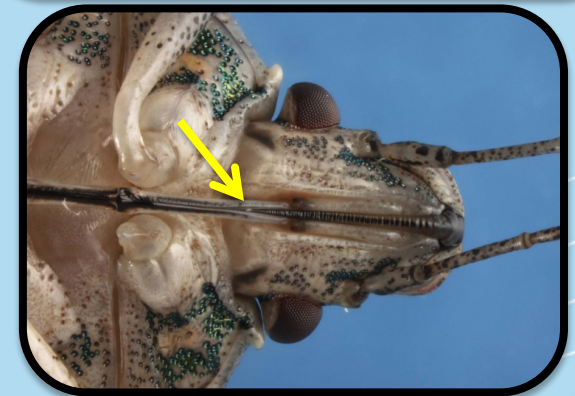
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Introduced species that are harmful

Brown marmorated stink bug on fruit



Brown marmorated stink bug adult



Piercing, sucking mouthpart

Photo credit:
adult: Susan Ellis, www.bugwood.org, #5369380 and #5443477
On fruit: Gary Bernon, USDA APHIS, www.bugwood.org, #1113016



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Introduced species that are harmful

Damage caused by laurel wilt disease



Redbay ambrosia beetle
adult



Photo credits:

Damage: CL Harmon, University of Florida

Adult and tunneling: Lyle Buss, University of Florida



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Summary

- There are many native species that are beneficial to the environment.
 - trees, fungi, and pollinators
- There are many introduced species that are beneficial to the environment.
 - Honeybees, night crawlers, Asian ladybird beetles, and parasitoid wasps
- There are many native species that are harmful to the environment.
 - Eastern tent caterpillars and southern pine beetle
- There are many introduced species that are harmful to the environment.
 - Asian longhorned beetle, emerald ash borer, brown marmorated stink bug, and laurel wilt



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Activity #1

- Research Project (follow along in your handout).
- You will provide an example of:
 - A native species that is beneficial to the environment
 - An introduced species that is beneficial to the environment
 - A native species that is harmful to the environment
 - An introduced species that is harmful to the environment



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Activity #1

- Answer the following questions for each of your examples:
 - What does it look like?
 - Is it from the U.S. and if so where is it found?
 - Did it come from another country and if so which country?
 - If it came from another country, where can we find it in the United States?
 - Why is it beneficial or harmful to the environment?
Be specific in your explanation.
- Write a report on what you found
 - Include title page and works cited.



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Activity #2

- Beneficial and Harmful Species Workbook
 - Go through the workbook and complete the exercises to further explore species that are beneficial to the environment and species that are harmful to the environment.



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Activity #3

- Computer Lab
 - Answer the questions in the handout on beneficial and harmful species as you complete the online exercises.
 - Turn in the handout to your teacher when you are done with it.



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