Second Chance Learning Guide

Grades 6-12

Contents

This Learning Guide supports the film, *Second Chance*, from the H-E-B Presents: Our Texas, Our Future film series. Watch the 22-minute film for free: https://ourtexasourfuture.com/stories/bears/

About This Resource

Historically, black bears lived throughout Texas, but by the beginning of the 20th century, they were rarely seen in the state. By the 1950s, no bears lived in Texas. However, a small population persisted in large, uninhabited mountain ranges of Northern Mexico.

Remarkably, in the 1990s, black bears began to travel from Mexico and disperse in parts of the Trans-Pecos ecoregion of West Texas. Researchers from the Borderlands Research Institute, along with the Texas Parks and Wildlife Department

and local residents, are seeking to learn as much as they can about this growing black bear population in the Mountains and Basins region of Texas.

Through the *Second Chance* video and the accompanying resources, experience how wildlife researchers observe bears, collect data, and collaborate with residents to learn what black bears are eating, how they use the landscape, and what we can do to live alongside black bears.

Learning Objectives

Students will...

1. INFER what caused black bears to be extirpated* from Texas by the 1950s and EXPLAIN factors that led to their natural return to the Mountains and Basins region of West Texas in the 1990s.
2. IDENTIFY whether or not black bears live near them.
3. SUMMARIZE what researchers are seeking to learn by trapping, collaring, and then releasing black bears in West Texas.
4. ANALYZE how the return of black bears is impacting the ecosystem of West Texas, including the people who live there.
5. DISCUSS whether or not human towns and communities can thrive while sharing a habitat with black bears.
6. DESCRIBE what humans can do to support the health of black bears.
7. EXPLORE the careers of three different STEM professionals (in wildlife research and management).

* **Extirpation** is the term used when a species becomes locally extinct in a specific area, but the species continues to exist elsewhere. In the 1950s American black bears became locally extinct in Texas, but black bear populations persisted in other parts of North America.

Teaching Tips

This Learning Guide is written with grades 6-12 in mind. You can implement the full guide or select the learning objectives, standards, and discussion questions that will work best for your students.

Texas Essential Knowledge & Skills (TEKS) Science

Science TEKS, Adopted 2017	Science TEKS, Adopted 2020/21 *implementation begins fall 2024*
• **6(12)(E)** describe biotic and abiotic parts of an ecosystem in which organisms interact • **7(5)(B)** diagram the flow of energy through living systems, including food chains, food webs, and energy pyramids • **8(11)(A)** investigate how organisms and populations in an ecosystem depend on and may compete for biotic factors such as food and abiotic factors such as quantity of light, water, range of temperatures, or soil composition • **BIO(12)(C)** analyze the flow of matter and energy through trophic levels using various models, including food chains, food webs, and ecological pyramids	• **6-8(3)(C)** engage respectfully in scientific argumentation using applied scientific explanations and empirical evidence • **6-8(4)(C)** research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (STEM) field to investigate STEM careers • **6-8(5)(B)** identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems • **6-8(5)(G)** analyze and explain how factors or conditions impact stability and change in objects, organisms, and systems

• **BIO(3)(A)** analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, so as to encourage critical thinking by the student • **BIO(12)(E)** describe how environmental change can impact ecosystem stability • **ENV(3)(A)** in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student • **ENV(9)(E)** evaluate the effect of human activities, including habitat restoration projects, species preservation efforts, nature conservancy groups, hunting, fishing, ecotourism, all-terrain vehicles, and small personal watercraft, on the environment	• **6(12)(A)** investigate how organisms and populations in an ecosystem depend on and may compete for biotic factors such as food and abiotic factors such as availability of light and water, range of temperatures, or soil composition • **7(12)(A)** diagram the flow of energy within trophic levels and describe how the available energy decreases in successive trophic levels in energy pyramids • **8(12)(A)** explain how disruptions such as population changes, natural disasters, and human intervention impact the transfer of energy in food webs in ecosystems • **BIO&ENV(3)(C)** engage respectfully in scientific argumentation using applied scientific explanations and empirical evidence • **BIO&ENV(4)(A)** analyze, evaluate, and critique scientific explanations and solutions by using empirical evidence, logical reasoning, and experimental and observational testing, so as to encourage critical thinking by the student • **BIO&ENV(4)(C)** research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (STEM) field in order to investigate STEM careers • **BIO(13)(D)** explain how environmental change, including change due to human activity, affects biodiversity and analyze how changes in biodiversity impact ecosystem stability • **ENV(11)(A)** evaluate the negative effects of human activities on the environment, including overhunting, overfishing, ecotourism, all-terrain vehicles, and personal watercraft • **ENV(11)(B)** evaluate the positive effects of human activities on the environment, including habitat restoration projects, species preservation efforts, nature conservancy groups, game/wildlife management, ecotourism • **ENV(12)(E)** argue from evidence whether or not a healthy economy and a healthy environment are mutually exclusive

Texas Essential Knowledge & Skills (TEKS)
Social Studies

Social Studies TEKS, Adopted 2018	Social Studies TEKS, Adopted 2022 *implementation begins fall 2024*
• **7(8)(A)** locate and compare the Mountains and Basins, Great Plains, North Central Plains, and Coastal Plains regions • **7(9)(A)** identify ways in which Texans have adapted to and modified the environment and explain the positive and negative consequences of the modifications • **7(19)(C)** analyze the effects of various scientific discoveries and technological innovations on the development of Texas such as advancements in the agricultural, energy, medical, computer, and aerospace industries • **7(20)(A)** differentiate between, locate, and use valid primary and secondary sources such as media and news services, biographies, interviews, and artifacts to acquire information about Texas	• **7(8)(A)** locate and compare the Mountains and Basins, Great Plains, North Central Plains, and Coastal Plains regions • **7(9)(A)** identify ways in which Texans have adapted to and modified the environment and explain the positive and negative consequences of the modifications • **7(19)(C)** analyze the effects of various scientific discoveries and technological innovations on the development of Texas such as advancements in the agricultural, energy, medical, computer, and aerospace industries • **7(20)(A)** differentiate between, locate, and use valid primary and secondary sources such as media and news services, biographies, interviews, and artifacts to acquire information about Texas

Next Generation Science Standards (NGSS)

MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

The performance expectation listed above was developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science & Engineering Practices
Engaging in Argument from Evidence
Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s).

- Construct an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem.

Disciplinary Core Ideas
LS2.C: Ecosystem Dynamics, Functioning, and Resilience

- Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations.

Crosscutting Concepts
Stability and Change

- Small changes in one part of a system might cause large changes in another part.

HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

The performance expectation listed above was developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science & Engineering Practices
Constructing Explanations and Designing Solutions in 9–12 builds on K–8 experiences and progresses to explanations and designs that are supported by multiple and independent student-generated sources of evidence consistent with scientific ideas, principles, and theories.

- Design, evaluate, and refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

Disciplinary Core Ideas
LS2.C: Ecosystem Dynamics, Functioning, and Resilience

- Moreover, anthropogenic changes (induced by human activity) in the environment—including habitat destruction, pollution, introduction of invasive species, overexploitation, and climate change—can disrupt an ecosystem and threaten the survival of some species.

LS4.D: Biodiversity and Humans

- Biodiversity is increased by the formation of new species (speciation) and decreased by the loss of species (extinction). (secondary)
- Humans depend on the living world for the resources and other benefits provided by biodiversity. But human activity is also having adverse impacts on biodiversity through overpopulation, overexploitation, habitat destruction, pollution, introduction of invasive species, and climate change. Thus sustaining biodiversity so that ecosystem functioning and productivity are maintained is essential to supporting and enhancing life on Earth. Sustaining biodiversity also aids humanity by preserving landscapes of recreational or inspirational value. (secondary) (Note: This Disciplinary Core Idea is also addressed by HS-LS4-6.)

ETS1.B: Developing Possible Solutions

- When evaluating solutions it is important to take into account a range of constraints including cost, safety, reliability and aesthetics and to consider social, cultural and environmental impacts. (secondary)

Crosscutting Concepts
Stability and Change

- Much of science deals with constructing explanations of how things change and how they remain stable.

Second Chance

English Resources

Academic Vocabulary

From: lead4ward Academic Vocab https://lead4ward.com/resources/

Grade 6 Science	Grade 7 Science	Grade 8 Science
• abiotic • biotic • ecosystem • organism • population • species	• abiotic • biotic • ecoregion • ecosystem • energy pyramid • environment • environmental change • flow of energy • food chain • food web • habitat • organism • species • trophic level	• abiotic factor • biotic factor • compete • energy pyramid • ecosystem • environment • environmental change • family • flow of energy • food chain • food web • habitat • omnivore • organism • population • species • trophic level

Biology		Grade 7 Social Studies
• abiotic factor • biotic factor • ecosystem • ecological pyramid • energy pyramid • environment • environmental change • family • flow of energy • food chain • food web	• habitat • impact • native • omnivore • organism • population • predator • predation • prey • species	• human factors • modifications • modified the environment • modify • negative consequences • positive consequences • regions

Background Reading

Trans-Pecos Ecoregion

The Trans-Pecos ecoregion of Texas (also called the Mountains and Basins physical region) includes the most western part of Texas. It borders New Mexico to the north and Mexico to the south and southwest. This ecoregion includes grasslands, deserts, and mountainous habitats. The variety of environments in the region results in a great biodiversity of plants and animals throughout the area.

Two black bear cubs in West Texas
Photo: Fin & Fur Films Productions

Bears

Animals classified in the Ursidae family are called bears. On our planet today, eight different species of bears live on four continents:

1. North America
    a. American black bears
    b. brown bears (which include grizzly bears)
    c. polar bears – in the Arctic Circle
2. South America
    a. spectacled bears (also called Andean bears)
3. Europe
    a. brown bears
    b. polar bears – in the Arctic Circle
4. Asia
    a. Asiatic black bears (also called moon bears)
    b. brown bears
    c. giant pandas
    d. polar bears – in the Arctic Circle
    e. sloth bears
    f. sun bears

Some animals are called "bears" but do not belong to the Ursidae family. For example:

- Koalas (*Phascolarctos cinereus*) are marsupials.
- Red pandas (*Ailurus fulgens*) are the only species classified in the family Ailuridae. Genetic studies have shown that this family is most closely related to three other families:
    - Procyonidae (which includes raccoons and ringtails, among other species)
    - Mustelidae (which includes badgers, otters, and wolverines, among others)
    - Mephitidae (which include skunks and stink badgers)

American Black Bear (*Ursus americanus*)
The American black bear is one of the largest mammals in North America. Adults can be 5-6 feet long, 2-3 feet tall, and weigh anywhere from 90-600+ pounds! Black bears are omnivores. Their diets change seasonally, depending on what types of foods are available. American black bears use their long claws to dig up roots. They have a powerful sense of smell that they often use to find berries & carrion (the decaying flesh of dead animals).

A black bear and her cub in West Texas
Photo: Fin & Fur Films Productions

Black bears can run up to 30 mph to catch prey. They can swim and climb trees very well. Female bears are called sows. Male bears are called boars. Their young are called cubs.

Predators of black bear cubs can include mountain lions, wolves, coyotes, bobcats, grizzly bears, and other black bears. Cubs are the most at risk of predation. Adult black bears may come into conflict with these other species but rarely due to direct predation. For example, conflicts may arise over food and when defending their young.

Black bears are normally shy and not aggressive to humans. If you let them be, they will usually leave you alone. If you do see a black bear, here are some things to do:

- Do not approach bears. Watch them from a distance.
- If you encounter a black bear at a close range, talk calmly while backing away slowly.
- Black bears will normally avoid humans. However, if a black bear does approach you, make yourself look bigger by raising your arms and your backpack or coat above your head. Yell at the bear to scare it off.

The recommendations above are for black bears. For more information on staying safe around black bears and brown/grizzly bears visit:
https://www.nps.gov/subjects/bears/safety.htm

History of Bears in Texas
In the past, American black bears lived in most parts of North America: throughout Alaska, Canada, the lower 48 states of the United States, and Northern Mexico. In the contiguous United States (also called the lower 48 states) the black bear population has been reduced to 65-75% of its original range (Scheick & McCown, 2014). Some factors that have caused this population decline include:

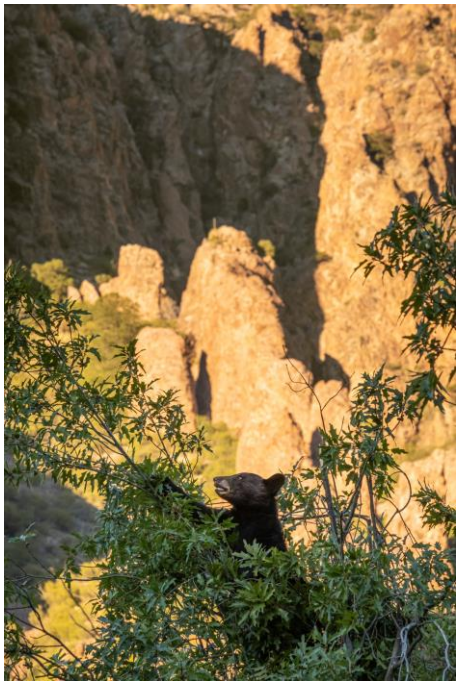
- habitat loss,
- land fragmentation (this occurs when humans divide a large area of land into small pieces or plots of land for use such as agriculture, housing developments, and urban areas),
- predator control, and
- unregulated hunting.

Historically, black bears lived throughout Texas, but by the beginning of the 20th century, they were rarely seen in the state. By the 1950s, no bears lived in Texas. However, a small population persisted in large, uninhabited mountain ranges of Northern Mexico. **Extirpation** is the term used when a species becomes locally extinct in a specific area, but the species continues to exist elsewhere. So, in the 1950s blacks became **extirpated** from Texas.

A black bear cub in West Texas
Photo: Fin & Fur Films Productions

Remarkably, in the 1990s, black bears began to travel from Mexico and disperse throughout the Trans-Pecos ecoregion of West Texas (also called the Mountains and Basins region), naturally returning to their former habitat. Four main factors led to the bears' return:

- increased human tolerance to bears,
- enforcement of hunting restrictions,
- availability of suitable habitat, and
- connectivity from Mexico.



A black bear in a tree in West Texas
Photo: Fin & Fur Films Productions

Today, at least two subspecies of black bears live in Texas. In West Texas, the Mexican black bear (*Ursus americanus eremicus*) and the New Mexico black bear (*Ursus americanus amblyceps*) live in desert and woodland habitats.

Black bears are occasionally seen in East Texas. They travel in and out of this area from the surrounding states. However, black bears do not make their permanent home there. Researchers think the bears documented in East Texas are primarily male bears searching for food, territory, or female bears.

Understanding the number of black bears returning to Texas and the factors that are leading to their return enables biologists to develop specific wildlife management plans and provide education for people who live in and near black bear habitats.

STEM Careers

Two of the STEM professionals featured in this video work for the Borderlands Research Institute (BRI). BRI's mission is to help conserve the natural resources of the Chihuahuan Desert Borderlands through research, education, and outreach. BRI provides land managers with the most current scientific information on the management of natural resources in the area.

- Matt Hewitt - Graduate Student, Borderlands Research Institute (BRI), Sul Ross State University

  Matt is currently pursuing his PhD in wildlife management. His undergraduate degree is a Bachelor of Science (BS) in Range and Wildlife Management from Texas A&M University-Kingsville. His master's degree from Sul Ross State University is also in Range and Wildlife Management.

  Matt works on the Black Bear Recolonization Project. This project seeks to better understand how and why bears are returning to West Texas. Information gathered will help researchers and wildlife managers understand how black bear populations may continue to expand throughout Texas and inform how landowners and community members can best live with black bears as their population expands.

  In his dissertation work, Matt focuses on estimating population size and factors influencing black bear space use in the Trans-Pecos region of Texas.

- Dr. Louis Harveson - Founder & Director, Borderlands Research Institute (BRI), Sul Ross State University

  As the Director of BRI, Dr. Harveson oversees the institute's research projects, manages a staff of more than 30 researchers, and works to secure funding for BRI's work.

  Dr. Harveson has taught courses and conducted research as a faculty member of Sul Ross State University in Alpine, Texas since 1998. His research has focused on the ecology and management of large mammals, upland game birds, and predators.

  Dr. Harveson's education includes the following degrees:
  - Bachelor of Science (BS) in Wildlife Management from Texas Tech University
  - Master of Science (MS) in Range and Wildlife Management from Texas A&M University-Kingsville
  - Doctor of Philosophy (PhD) in Wildlife Science from a program with Texas A&M University-Kingsville and Texas A&M University

The third STEM professional featured in this video works for the Texas Parks and Wildlife Department (TPWD). TPWD is a Texas state agency that oversees and protects wildlife and their habitats. TPWD also acquires and manages parklands and historic areas and provides outdoor recreational opportunities.

- Dr. Dana Karelus - State Mammalogist, Texas Parks and Wildlife Department

  In this role, Dr. Karelus oversees the conservation and management of non-game and rare mammals statewide.

  As an undergrad, Dr. Karelus majored in mechanical engineering. In her first job, she worked as an engineer for the Space Shuttle program at Kennedy

Space Center (KSC). While she enjoyed the challenge of working on space shuttle launches, the thing she enjoyed most about working at KSC was that it was on a wildlife refuge. She spent her lunch breaks outside photographing animals and observing the wildlife around her workplace.

When the Space Shuttle program was retired, there were mass layoffs at the KSC, and Dr. Karelus lost her job. This provided her with the perfect opportunity to return to school to pursue the field of study she truly loved: wildlife ecology and conservation.

Take Action

As black bear populations expand across Texas and throughout the United States, here are some things you can do to support black bear health:

- Understand the range of black bears in your area. Have there been black bear sightings near where you live? If not, where do the nearest black bears live?
- If you do see a bear in your area or evidence of a bear (like a bear track), take a picture and contact your local Texas Parks and Wildlife Biologist. Black bears are protected in Texas—it is illegal to hunt, trap, kill, or otherwise take them. However, if a bear is a clear and present threat to human safety or property, the Texas Parks and Wildlife Department can take management action to remove the problem bear from the situation for human safety.
- Continue to learn about black bears and share what you learn so others in your community know what to do if they see a black bear.
- Black bears are always looking for food! If there are bears in your area, make sure no food is available outside. This means bear-proofing garbage cans, not keeping pet/livestock feed outside, and limiting the use of bird feeders and other wildlife feeders. Learn more here: BearWise.
- Learn more about Borderlands Research Institute's (BRI) work here.

A researcher tracking collared bears in West Texas
Photo: Fin & Fur Films Productions

Discussion Questions

Humans & Black Bears

1. Do black bears live near you? If you are not sure, check this map: USGS Known range of the American black bear *(Ursus americanus)*
2. What Texas region are black bears returning to? (Mountains and Basins, Great Plains, North Central Plains, or Coastal Plains)
3. Do you think human towns and communities can thrive while bears live in the area? Why or why not?
4. In the video, Alida Lorio, a resident of Terlingua, Texas, says, "If we want to live here, I think we have a responsibility not only for ourselves to mitigate our own interactions with bears, but to educate when we can so that other property owners can learn to mitigate those interactions and not be so wound up about it."
    a. Do you agree with Alida's idea that humans have a responsibility to do what they can to reduce their own interactions with bears and teach others how to live in areas also inhabited by bears? Why or why not?

Environmental Impacts

5. Sketch a food web that shows the flow of energy in a West Texas ecosystem. Include a black bear in the food web. For Grade 7: To further investigate the available energy in this ecosystem, also create an energy pyramid with the same organisms used in the food web.
6. By the 1950s, Texans had killed and driven black bears out of the state. What environmental changes caused black bears to die/leave?
7. Look back at the food web and/or energy pyramid you drew in question #5. How did the removal of black bears from the ecosystem impact other organisms?
8. What are the Borderlands Research Institute (BRI) researchers seeking to learn by trapping and collaring black bears?
9. How is the return of black bears impacting the ecosystem of West Texas and the people who live there?
10. First, list things humans can do to support black bear health and successfully coexist with the species as their population continues to grow in Texas and other parts of the United States. Then, look over your list and circle the things YOU can do to help black bear populations thrive.
11. Imagine you live in Terlingua, Texas. Other than the ideas shown in the film, *Second Chance*, what else would you do to ensure the environment is healthy for both you and the black bears that live there?

STEM Careers

12. Three STEM professionals were highlighted in this video:
    a. Matt Hewitt, a graduate student at the Borderlands Research Institute (BRI) at Sul Ross State University
    b. Dr. Louis Harveson, the Founder & Director of the Borderlands Research Institute (BRI) at Sul Ross State University
    c. Dr. Dana Karelus, the State Mammalogist for the Texas Parks and Wildlife Department

    Write down two questions you could ask each person to learn more about their job.

Name _____

Second Chance
Discussion Question Responses

Directions: After watching the film, *Second Chance*, answer the discussion questions. For each question, first write the number of the question and then write your answer.

Answer Key - Discussion Questions

Humans & Black Bears

1. Students will use the following map to determine if black bears live near them. USGS Known range of the American black bear (Ursus americanus)
2. In Texas, black bears are returning to the Mountains and Basins region.
3. Students will explain whether or not they think human towns and communities can thrive while bears live in the area.
4. Students will explain if they agree or disagree with the following quote from the film. Alida Lorio, a resident of Terlingua, Texas, says, "If we want to live here, I think we have a responsibility not only for ourselves to mitigate our own interactions with bears, but to educate when we can so that other property owners can learn to mitigate those interactions and not be so wound up about it."

Environmental Impacts

5. Students will sketch a food web that includes black bears. Possible other organisms in the food web include plant roots, seeds, berries, acorns, carrion, mountain lions, wolves, coyotes, bobcats, and humans. Students in Grade 7 will also create an energy pyramid with the same organisms used in the food web.
6. Some factors that caused black bears to become extirpated from Texas by the 1950s include:
    - Black bears were hunted by humans for meat and fat (which was turned into lard and oil).
    - Government-sanction predator control programs sought to kill native predators to prevent conflict between wildlife and settlers/their livestock.
    - Black bears were hunted for sport.
    - Black bears' territories were disturbed as people built farms, houses, and towns.
7. Answers will vary. Students will describe how the removal of black bears impacted the other organisms in the food web and/or energy pyramid they drew in question #5.
8. Some of the things BRI researchers are seeking to learn by trapping and collaring black bears include:
    - The GPS collars will tell researchers where the black bears spend most of their time and help researchers better understand the bears' movement patterns.
    - Researchers use blood and tissue samples collected from bears to learn about the genetic structure of the black bear population in the Trans-Pecos ecoregion.
    - Researchers want to learn as much as they can about how black bears are returning to West Texas. They will use this information to help landowners and communities prepare to live with bears as bears return to more parts of Texas.
9. Some impacts of black bears' return to the West Texas ecosystem include:
    - The return of black bears to their native habitat means an increase in biodiversity which has consequences that are just beginning to be understood.
    - Black bears have been seen walking through residents' yards.

- Black bears have been getting into trash in dumpsters.
- In the fall, bears eat up to 20,000 Calories a day. Their need for that much food can cause them to be more willing to explore areas where humans live as they look for food.

10. To support the health of bears in areas where black bears and humans coexist, humans can:
    - Secure containers that hold trash or food outside so bears cannot access it. This applies to human food as well as pet/livestock feed and feeders (for birds, deer, quail, etc.).
    - Teach others about how to secure trash and food that might attract bears.
    - Avoid bears when possible and know how to act in case of a black bear encounter.
    - Teach others how to avoid black bears and what to do in case of a bear encounter.
    - Report bear sightings to local parks and wildlife departments.
    - Students may generate additional ideas.

    After creating a list similar to the one above, students will circle things they can do to help black bear populations thrive.
11. Students will share additional ideas they have to make the environment in Terlingua, Texas healthy for both humans and the black bears who live there.

STEM Careers

12. Students will write down two questions they could ask each STEM professional in the film to learn more about their job. These professionals include:
    - Matt Hewitt, a graduate student at the Borderlands Research Institute (BRI) at Sul Ross State University
    - Dr. Louis Harveson, the Founder & Director of the Borderlands Research Institute (BRI) at Sul Ross State University
    - Dr. Dana Karelus, the State Mammalogist for the Texas Parks and Wildlife Department

Second Chance

Spanish Resources

Acerca de este recurso

Los osos se encontraban históricamente por todo el estado de Texas, pero a comienzos del siglo 20, rara vez se veían en el estado. En la década de 1950, ya no vivían osos en Texas. Sin embargo, una pequeña población persistió en grandes cadenas montañosas deshabitadas en el norte de México.

Extraordinariamente, en la década de 1990, unos osos negros empezaron viajando desde México y dispersándose en partes de la ecorregión Trans-Pecos en el oeste de Texas. Investigadores en el Instituto de Investigaciones Borderlands, junto con el Departamento de Parques y Fauna de Texas y los residentes locales, están intentando de aprender todo lo que puedan sobre esta población creciente de osos negros en la Región de la Cuenca y la Cordillera de Texas.

A través del video llamado Una segunda oportunidad y los recursos educativos que lo acompañan, puedes experimentar cómo los investigadores de la fauna observan los osos, recopilan datos, y colaboran con los residentes para aprender de qué se están alimentando los osos, cómo ellos utilizan el paisaje, y qué podemos hacer para poder convivir con estos osos negros.

Una osa negra y sus cachorro en el oeste de Texas
Foto: "Fin & Fur Films Productions"

Vocabulario académico

De: lead4ward Academic Vocab https://lead4ward.com/resources/

6º Grado Ciencias	7º Grado Ciencias	8º Grado Ciencias
• abiótico • biótico • ecosistema • organismo • población • especie	• abiótico • biótico • ecorregión • ecosistema • pirámide de energía • medio ambiente • cambio medioambiental • flujo de energía • cadena alimenticia • red alimenticia • hábitat • organismo • especie • nivel trófico	• factor abiótico • factor biótico • competir • pirámide de energía • ecosistema • medio ambiente • cambio medioambiental • familia • flujo de energía • cadena alimenticia • red alimenticia • hábitat • omnívoro • organismo • población • especie • nivel trófico

Biología	7º Grado Estudios Sociales
• factor abiótico • factor biótico • ecosistema • pirámide ecológica • pirámide energética • medio ambiente • cambio medioambiental • familia • flujo de energía • cadena alimenticia • red alimenticia • hábitat • impacto • nativo • omnívoro • organismo • población • depredador • depredación • presa • especie	• factores humanos • modificaciones • modificó el medio ambiente • modificar • consecuencias negativas • consecuencias positivas • regiones

Lectura de fondo

La ecorregión de Trans-Pecos

La ecorregión de Trans-Pecos en Texas (también denominada la Región Física de la Cuenca y la Cordillera) incluye la parte más al oeste de Texas. Limita al norte con New México y al sur y suroeste con México. Esta ecorregión incluye praderas, desiertos, y hábitats montañosos. La variedad de ambientes de la región da lugar a una gran biodiversidad de plantas y animales en toda la zona.

Dos cachorros de oso negro en el oeste de Texas Foto: "Fin & Fur Films Productions"

Osos

Los animales clasificados en la familia Ursidae se llaman "osos". En nuestro planeta actual, hay ocho diferentes especies de osos viviendo en cuatro continentes:

1. Norteamérica
    a. osos negros americanos
    b. osos pardos (incluso los osos "grizzly")
    c. osos polares – en el círculo polar ártico
2. Sudamérica
    a. osos de anteojos (también llamados osos andinos)
3. Europa
    a. osos pardos
    b. osos polares – en el círculo polar ártico
4. Asia
    a. osos negros asiáticos (también llamados osos lunares)
    b. osos pardos
    c. pandas gigantes
    d. osos polares – en el círculo polar ártico
    e. osos solares
    f. osos perezosos

Algunos animales son llamados "osos" pero no pertenecen a la familia Ursidae. Por ejemplo:

- Los koalas (*Phascolarctos cinereus*) son marsupiales.
- Los pandas rojos (*Ailurus fulgens*) son la única especie clasificada en la familia Ailuridae. Estudios genéticos han demostrado que esta familia está más estrechamente relacionada a tres otras familias:
    - Procyonidae (que incluye mapaches y mapaches de cola anillada, entre otras especies)
    - Mustelidae (que incluye tejones, nutrias, y glotones, entre otros)
    - Mephitidae (que incluye zorrillos y tejones apestosos)

El oso negro americano (*Ursus americanus*)

El oso negro americano es uno de los mamíferos más grandes en Norteamérica. Los adultos pueden medir 5-6 pies de largo, 2-3 pies de alto, ¡y pueden pesar entre 90-600+ libras! El oso negro es un omnívoro. Su dieta cambia según la estación, dependiendo de los tipos de alimentos disponibles. Los osos negros americanos usan sus garras largas para desenterrar raíces. Tienen un gran sentido del olfato que usan para encontrar bayas y carroña (la carne en descomposición de animales muertos).

Una osa negra y su cachorro en el oeste de Texas Foto: "Fin & Fur Films Productions"

Los osos negros pueden correr 30 mph para capturar presa. Pueden nadar muy bien y trepar a los árboles. Las hembras de oso se llaman cerdas. Los machos se llaman verracos. Sus crías se llaman cachorros.

Los depredadores de los cachorros de oso negro pueden incluir pumas, lobos, coyotes, linces, osos grizzly u otros osos negros. Los cachorros son los que corren mayor riesgo de ser depredados. Los osos negros adultos pueden entrar en conflicto con estas otras especies, pero rara vez debido a la depredación directa. Por ejemplo, pueden surgir conflictos por la comida y al defender a sus crías.

Los osos negros suelen ser tímidos y no agresivos con los humanos. Si los dejas en paz, usualmente ellos te dejarán en paz también. Si veas un oso negro, esto es lo que debes hacer:

- No te acerques a un oso. Obsérvalos desde lejos.
- Si te encuentras con un oso a corta distancia, habla con calma mientras retrocedes lentamente.
- Los osos negros suelen evitar a los humanos. No obstante, si un oso negro te acerque, hazte ver más grande levantando los brazos y tu mochila o abrigo encima de tu cabeza. Grita al oso para asustarlo.

Las recomendaciones arriba se refieren a los osos negros. Para más información sobre mantenerte seguro con los osos negros y pardos /grizzly visita: https://www.nps.gov/subjects/bears/safety.htm

Las historia de los osos en Texas

Anteriormente, los osos negros americanos vivían en la mayor parte de Norteamérica: en todo Alaska, Canadá, los 48 estados contiguos de Estados Unidos, y el norte de México. En los estados contiguos (también se les llama los 48 estados continentales) se ha reducido la población de osos negros al 65-75% de su alcance original (Scheick y McCown, 2014). Este descenso de la población se causó por los siguientes factores:

- la pérdida de su hábitat,
- fragmentación de la tierra (ésta ocurre cuando alguien divide una gran superficie de tierra en pequeñas parcelas para facilitar su uso en la agricultura, la promoción de viviendas, y la urbanización),
- control de depredadores, y
- la caza no reglamentada.

Un cachorro de oso negro en el oeste de Texas Foto: "Fin & Fur Films Productions"

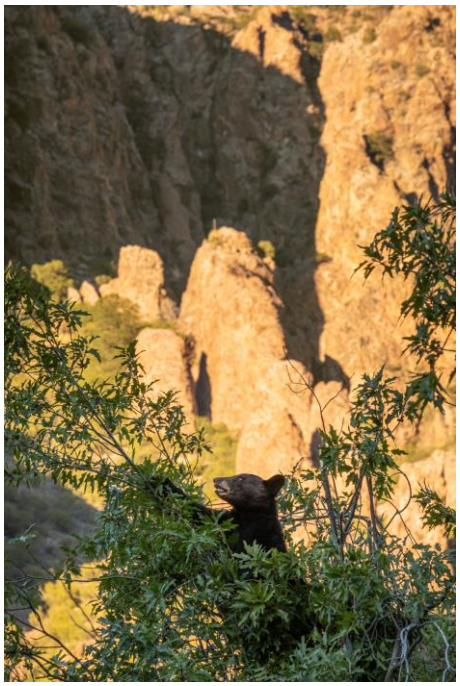
Los osos se encontraban históricamente por todo el estado de Texas, pero a comienzos del siglo 20, rara vez se veían en el estado. En la década de 1950, ya no vivían osos en Texas. Sin embargo, una pequeña población persistió en grandes cadenas montañosas deshabitadas en el norte de México. **Extirpación** es el término usado cuando una especie se extingue localmente en una zona determinada, pero esa especie sigue existiendo en otros lugares. Entonces, en la década de 1950, el oso negro **se extirpó** de Texas.

Extraordinariamente, en la década de 1990, unos osos negros empezaron viajando desde México y dispersándose en partes de la ecorregión Trans-Pecos en el oeste de Texas (también denominada la Región de la Cuenca y la Cordillera), regresando de forma natural a su hábitat anterior. Cuatro factores contribuyeron al regreso de los osos:

- un aumento de la tolerancia humana a los osos,
- la aplicación de las restricciones de caza,
- disponibilidad de hábitats adecuados, y
- conectividad desde México.

En la actualidad, al menos dos subespecies de osos negros viven en Texas. En el oeste de Texas, el oso negro mexicano (*Ursus americanus eremicus*) y el oso negro de Nuevo México (*Ursus americanus amblyceps*) viven en el desierto y en los hábitats boscosos.

Los osos negros se ven de vez en cuando en el este de Texas. Ellos entran y salen de esta área desde los estados circundantes, pero los osos negros no hacen allí su hogar permanente. Los investigadores creen que los osos documentados en el este de Texas son principalmente osos machos buscando alimentos, territorio, u osas hembras.



Un oso negro en un árbol en el oeste de Texas Foto: "Fin & Fur Films Productions"

Entender el número de osos negros que regresan a Texas y los factores que facilitan su regreso permite a los biólogos elaborar planes específicos de gestión de la fauna salvaje y educar a la gente que vive en y cerca de los hábitats del oso negro.

Carreras STEM

Dos de los profesionales STEM presentados en este video trabajan por el Borderlands Research Institute (BRI). La misión de BRI es de conservar los recursos naturales del Desierto de Chihuahua a través de investigaciones, educación, y divulgación.

BRI provee a los administradores de tierra la información científica más actual sobre la gestión de los recursos naturales en la zona.

- Matt Hewitt – Estudiante de postgrado, Borderlands Research Institute (BRI), Sul Ross State University

  Matt está cursando un doctorado en Gestión de la Fauna Salvaje. Obtuvo su Licenciatura (BS) en la Gestión de Pastizales y Fauna Silvestre de Texas A&M University-Kingsville. También obtuvo su Maestría (MS) de Sul Ross State University en la Gestión de Pastizales y Fauna Silvestre.

  Matt trabaja en el Proyecto de la Recolonización del Oso Negro. Este proyecto trata de comprender mejor cómo y por qué regresan los osos al oeste de Texas. La información recopilada ayudará a los investigadores y gestores de la fauna salvaje a entender cómo las poblaciones de osos negros tal vez sigan expandiéndose por todo Texas, y les informará sobre cómo los propietarios de terrenos y miembros de la comunidad puedan convivir con los osos mientras se amplie su población.

  En su trabajo de tesis doctoral, Matt se centra en estimar el tamaño de las poblaciones y en estudiar los factores que influyan el uso del terreno por los osos negros en la Región Trans-Pecos de Texas.

- Dr. Louis Harveson - Fundador & director, Borderlands Research Institute (BRI), Sul Ross State University

  Como director de BRI, Dr. Harveson supervisa los proyectos de investigación del instituto, dirige un personal de más de 30 investigadores, y trabaja para garantizar la financiación del trabajo de BRI.

  Dr. Harveson ha impartido cursos y dirigido investigaciones como miembro del profesorado en Sul Ross State University en Alpine, Texas desde 1998. Sus investigaciones se han centrado en la ecología y gestión de los grandes mamíferos, aves de caza, y depredadores.

  La educación del Dr. Harveson incluye los siguientes títulos:
  - Licenciatura (BS) en Gestión de la Fauna Silvestre de Texas Tech University
  - Maestría (MS) en Gestión de Pastizales y Fauna Silvestre de Texas A&M University-Kingsville
  - Doctorado (PhD) en Ciencia de la Vida Salvaje de un programa con Texas A&M University-Kingsville y Texas A&M University

La tercera profesional STEM que se presenta en este video trabaja con el Departamento de Parques y Fauna de Texas, Texas Parks and Wildlife Department (TPWD). TPWD es una agencia estatal en Texas que supervisa y protege la vida silvestre y sus hábitats. TPWD también adquiere y gestiona parques y zonas históricas y provee oportunidades recreativas al aire libre.

- Dr. Dana Karelus - Mastozoólogo estatal, Departamento de Parques y Fauna de Texas

  En este cargo, la Dra. Karelus supervisa la conservación y gestión de mamíferos raros y no cinegéticos en todo el estado.

  Como estudiante universitario, la Dra. Karelus se especializó en ingeniería mecánica. En su primer empleo, ella trabajó como ingeniera para el programa del transbordador espacial en el Centro Espacial Kennedy (KSC). Aunque disfrutaba con el reto de trabajar en lanzamientos del transbordador espacial, lo que más le gustaba de su trabajo en KSC era su ubicación en un refugio de vida silvestre. Ella pasaba la hora de almuerzo fuera tomando fotos de los animales y observando la vida silvestre alrededor de su lugar de trabajo.

  Cuando se retiró el programa del transbordador espacial, hubo despidos masivos en KSC, y la Dra. Karelus perdió su trabajo. Eso le dio la oportunidad perfecta para regresar a la universidad y dedicarse al campo de estudio que realmente amaba: la ecología y conservación de la fauna silvestre.

Tomar medidas

Mientras se expanden las poblaciones de osos negros por todo Texas y los Estados Unidos, aquí hay algunas cosas que puedes hacer para apoyar la salud del oso negro:

- Entender el alcance de los osos negros en tu zona. ¿Ha habido avistamientos del oso negro cerca de donde vives? Si no es así, ¿dónde viven los osos negros más cercanos?
- Si ves un oso en tu zona o evidencia de un oso (como una huella de oso), toma una foto y ponte en contacto con tu biólogo local del Departamento de Parques y Fauna de Texas. Los osos negros están protegidos en Texas—es ilegal cazarlos, atraparlos, matarlos, o de cualquier otra manera sacarlos. Sin embargo, si un oso es una amenaza clara y presente para la seguridad humana o la propiedad, el Departamento de Parques y Fauna Salvaje de Texas puede tomar medidas de gestión para quitar el oso de la situación para preservar la seguridad humana.
- Seguir aprendiendo sobre los osos negros y compartiendo lo que has aprendido con los demás, para que otra gente de tu comunidad sepa que se debe hacer si ellos vean un oso negro.
- ¡Los osos negros están siempre buscando alimentos! Si hay osos en tu zona, asegúrate de que no haya comida disponible afuera. Esto significa hacer que tus botes de basuras estén resistentes a los osos, no guardar afuera los alimentos de mascotas/ganado, y limitar el uso de comederos para pájaros u otros animales salvajes. Aprende más aquí: BearWise.
- Aprende más sobre el trabajo del Borderlands Research Institute (BRI) aquí.

Preguntas de discusión

Humanos & Osos Negros

1. ¿Hay osos negros que viven cerca de ti? Si no sabes con certeza, consulta este mapa: USGS Known range of the American black bear *(Ursus americanus)*
2. ¿A cuál región de Texas están regresando los osos negros? (la Cuenca y la Cordillera, las Grandes Llanuras, las Tierras Bajas Interiores, o las Llanuras Costeras del Golfo)
3. ¿Crees que los pueblos y comunidades humanos pueden prosperar con los osos viviendo en su zona? ¿Por qué o por qué no?
4. En el video, Alida Lorio, una residente de Terlingua, Texas, dice, "Si queremos vivir aquí, creo que tenemos una responsabilidad no solo para nosotros mismos y para mitigar nuestras propias interacciones con los osos, sino de educar cuando es posible a otros dueños de propiedades para que puedan aprender a mitigar esas interacciones sin agitarse tanto."
    a. ¿Estás de acuerdo con la opinión de Alida que los humanos tienen una responsabilidad de hacer lo que puedan para reducir sus propias interacciones con los osos e informar a los demás sobre cómo vivir en áreas habitadas por osos? ¿Por qué o por qué no?

Impactos Ambientales

5. Dibuja una red alimenticia que muestra el flujo de energía en un ecosistema de oeste de Texas. Incluye un oso negro en tu red alimenticia. Para el 7º Grado: Para investigar más sobre la energía disponible en este ecosistema, también crea una pirámide de energía con los mismos organismos que incluiste en la red alimenticia.
6. A principios de la década de 1950, los Tejanos habían matado y expulsado del estado los osos negros. ¿Cuáles cambios medioambientales causaron que los osos negros se murieran/salieran?
7. Consulta la red alimenticia y/o la pirámide de energía que dibujaste en la pregunta #5. ¿Cómo se afectaron los otros organismos por la eliminación de los osos negros del ecosistema?
8. ¿Qué están tratando de aprender los investigadores del Borderlands Research Institute (BRI) a través de atrapar y poner collares en los osos negros?
9. ¿Cómo está el regreso de los osos negros impactando el ecosistema del oeste de Texas y la gente que vive allí?
10. Primero, enumera unas cosas que puede hacer la gente para apoyar la salud de los osos negros y convivir exitosamente con la especie, mientras sigue aumentando su población en Texas y en otras partes de Estados Unidos. Luego, considera tu lista y encierra las cosas que TÚ puedes hacer para ayudar a los osos negros a prosperar.
11. Imagina que vives en Terlingua, Texas. Aparte de las ideas presentadas en el video Una segunda oportunidad, ¿qué más harías para garantizar que el ambiente esté saludable para ti y para los osos negros que viven en esa zona?

Continúa en la siguiente página.

Carreras STEM

12. Tres profesionales STEM se destacaron en este video:
    a. Matt Hewitt, un estudiante de postgrado en Borderlands Research Institute (BRI) en Sul Ross State University
    b. Dr. Louis Harveson, el fundador & director del Borderlands Research Institute (BRI) en Sul Ross State University
    c. Dra. Dana Karelus, Mastozoólogo estatal del Departamento de Parques y Fauna de Texas

    Escribe dos preguntas que podrías hacer a cada persona para aprender más acerca de su trabajo.

Un investigador rastreando osos con collar en el oeste de Texas
Foto: "Fin & Fur Films Productions"

Nobre _____

Una segunda oportunidad
Respuestas a las preguntas de discusión

Instrucciones: Después de ver el video, *Una segunda oportunidad*, contesta las preguntas de discusión. Para cada pregunta, primero escribe el número de la pregunta y luego escribe tu respuesta.

Sources (Fuentes)

- International Union for Conservation of Nature (IUCN). (2007). *Seventy-five percent of bear species threatened with extinction.* Press release. https://www.iucn.org/content/seventy-five-percent-bear-species-threatened-extinction
- National Park Service. (n.d.). *American Black Bear.* Retrieved February 13, 2024, from https://www.nps.gov/articles/000/american-black-bear.htm
- Scheick, B.K. & McCown, W. (2014). Geographic distribution of American black bears in North America. *Ursus*, 25(1), 24–33. https://doi.org/10.2192/URSUS-D-12-00020.1
- Smithsonian's National Zoo & Conservation Biology Institute. (n.d.). *Red panda Ailurus fulgens.* Retrieved February 13, 2024, from https://nationalzoo.si.edu/animals/red-panda
- Texas Parks & Wildlife Department (TPWD). (n.d.). *Bear Safety in Mind.* Retrieved February 13, 2024, from https://tpwd.texas.gov/publications/pwdpubs/media/pwd_br_w7000_1428.pdf
- Texas Parks & Wildlife Department. (n.d.). *Black Bear (Ursus americanus).* Retrieved February 13, 2024, from https://tpwd.texas.gov/huntwild/wild/species/blackbear/
- Texas Tech University. (n.d.). *American Black Bear Ursus americanus Pallas 1790.* Retrieved February 13, 2024, from https://www.depts.ttu.edu/nsrl/mammals-of-texas-online-edition/Accounts_Carnivora/Ursus_americanus.php
- White, D., McPeake, R., & Eastridge, R. (n.d.). *Arkansas Black Bears: Biology and Habits.* University of Arkansas. Retrieved February 13, 2024 from https://www.uaex.uada.edu/publications/pdf/FSA-9086.pdf
- Wiig, Ø., Amstrup, S., Atwood, T., Laidre, K., Lunn, N., Obbard, M., Regehr, E. & Thiemann, G. (2015). Ursus maritimus, Polar Bear. *The IUCN Red List of Threatened Species 2015*: e.T22823A14871490. http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T22823A14871490.en