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生命科学

Ecosystems

生态系统

NANCY FINTON (美) 著

外语教学与研究出版社

FOREIGN LANGUAGE TEACHING AND RESEARCH PRESS

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A Pack of “Dogs”

一群“小狗”



“Yip¹!” A black-tailed prairie dog scans² the horizon³ and then jumps into the air with a little barking⁴ sound. In prairie dog language, that means “the coast is clear.” All around, more prairie dogs pop their heads out of holes in the ground and begin nibbling⁵ on grasses.

A rattlesnake⁶ slithers⁷ toward the animals. “Chirp⁸ yip!” The prairie dog gives a warning cry and shakes its tail. Quick as you can blink⁹, the animals dive¹⁰ into holes and scurry¹¹ away through a web of tunnels¹². The prairie dogs know that rattlesnakes can swallow¹³ baby prairie dogs whole.

By warning of danger, these little prairie dogs help one another survive¹⁴. But even in a group, prairie dogs can’t make it on their own. The group’s survival depends on the other animals, plants, soil¹⁵, and air in the ecosystem. So get ready to dig deep into a prairie ecosystem—and see some of the amazing¹⁶ ways that plants and animals work together.

- | | | |
|----------------|-------------|----------|
| 1. yip | <i>int.</i> | 尖声狂吠 |
| 2. scan | <i>v.</i> | 反复查看 |
| 3. horizon | <i>n.</i> | 地平线 |
| 4. bark | <i>v.</i> | 吠, 叫 |
| 5. nibble | <i>v.</i> | 一点一点地咬 |
| 6. rattlesnake | <i>n.</i> | 响尾蛇 |
| 7. slither | <i>v.</i> | (蜿蜒地) 滑行 |
| 8. chirp | <i>n.</i> | 唧唧声 |
| 9. blink | <i>v.</i> | 眨眼睛 |
| 10. dive | <i>v.</i> | 潜没; 消失 |
| 11. scurry | <i>v.</i> | 急赶 |
| 12. tunnel | <i>n.</i> | 地道 |
| 13. swallow | <i>v.</i> | 吞下 |
| 14. survive | <i>v.</i> | 幸存 |
| 15. soil | <i>n.</i> | 土壤 |
| 16. amazing | <i>adj.</i> | 惊人的 |

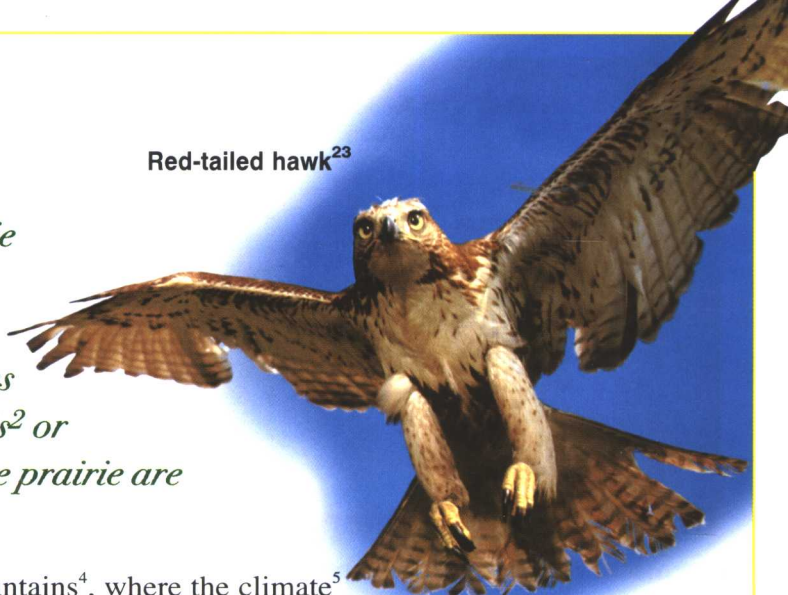


Striking a Balance

打破平衡



Red-tailed hawk²³



The North American prairie was once one of the largest grasslands on Earth. Today much of it lies beneath¹ cities or croplands² or roadways³. But parts of the prairie are still prairie.

Just east of the Rocky Mountains⁴, where the climate⁵ is very dry, lies a stretch⁶ of shortgrass prairie⁷. There you'll still find bison⁸ munching⁹ the plants and prairie dogs yipping. You'll see short, stubby¹⁰ grasses and big yellow sunflowers¹¹. You could see a snake glide¹² past or a hawk¹³ circling overhead¹⁴. And you might even catch sight of a jackrabbit¹⁵ or a deer-like pronghorn¹⁶—the fastest mammal¹⁷ in North America—speeding by.

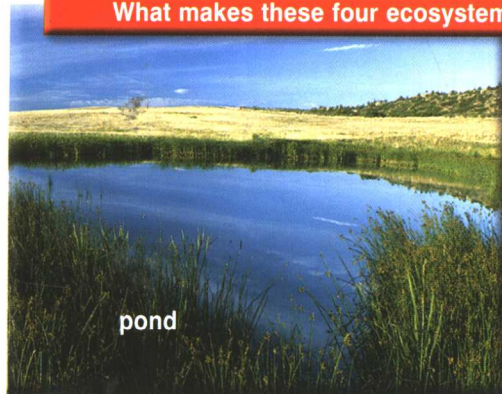
These plants and animals are all important to this prairie ecosystem. An ecosystem can be described as the soil, rocks, plants, animals, water, climate, land, and all the processes that link¹⁸ these things together.

All of the living things in the shortgrass prairie ecosystem work together to keep it healthy. These species¹⁹ might not survive in a different ecosystem—a forest or a swamp²⁰, for example. But each is right at home here, getting everything it needs from the prairie.

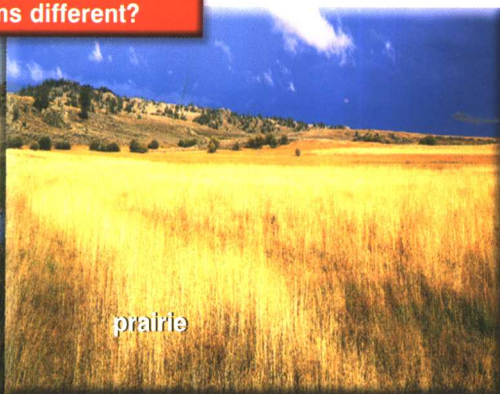
1. beneath	<i>prep.</i>	在……下面	12. glide	<i>v.</i>	滑行
2. cropland	<i>n.</i>	耕地; 农田	13. hawk	<i>n.</i>	鹰
3. roadway	<i>n.</i>	车行道	14. overhead	<i>adv.</i>	在头顶
4. Rocky Mountains		落基山脉	15. jackrabbit	<i>n.</i>	长耳大野兔
5. climate	<i>n.</i>	气候	16. pronghorn	<i>n.</i>	叉角羚
6. stretch	<i>n.</i>	连绵的一片	17. mammal	<i>n.</i>	哺乳动物
7. shortgrass prairie		北美矮草草原	18. link	<i>v.</i>	连接
8. bison	<i>n.</i>	野牛	19. species	<i>n.</i>	种
9. munch	<i>v.</i>	用力咀嚼	20. swamp	<i>n.</i>	沼泽
10. stubby	<i>adj.</i>	短而粗的	21. goldenrod	<i>n.</i>	一枝黄花属植物
11. sunflower	<i>n.</i>	向日葵	22. bloom	<i>v.</i>	开花
			23. red-tailed hawk		红尾鸢

Goldenrod²¹ blooming²² on the prairie

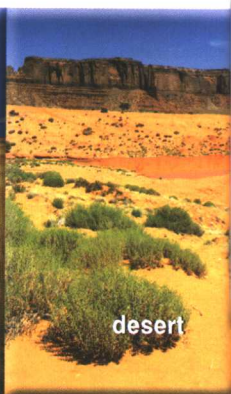
What makes these four ecosystems different?



pond



prairie



desert

Dry Air Makes a Difference

Each ecosystem has its own particular¹ climate. On the shortgrass prairie, the air feels as dry as dust and the sun beats down on you. You look for shade, but there are no trees in sight. A warm wind dries your sweat² as soon as it forms.

The heat, wind, and lack³ of water on the shortgrass prairie are as much a part of the ecosystem as the animals and plants. Only species that are adapted⁴ to these conditions can survive there. Prairie grasses need long roots that soak⁵ up water from deep underground. This helps grasses survive long droughts⁶. The strong winds spread pollen⁷ among grasses and help them make new seeds. Bison can graze⁸ all day in the sun without seeking shade, and prairie dogs and badgers⁹ live in burrows¹⁰ to keep cool in summer and warm in winter.

Community¹¹ Living

Water, air, and earth are nonliving parts

of an ecosystem. The living part is the community of plants and animals. Animals in a community count on other members of the community for food. And that's not the only way they help one another.

In the prairie community, butterflies and other insects¹² spread pollen from flower to flower, helping new plants grow up to feed more animals. Ladybugs¹³ help plants by eating smaller insects that could chew¹⁴ through the leaves and stems. Prairie dogs build burrows that other animals share: Burrowing owls¹⁵, black-footed ferrets¹⁶, rattlesnakes, mice, lizards¹⁷, and spiders¹⁸ all make cozy¹⁹ nests in abandoned²⁰ prairie dog tunnels.

- | | | | | | |
|---------------|-------------|------|-------------------------|-------------|-------|
| 1. particular | <i>adj.</i> | 特殊的 | 11. community | <i>n.</i> | 群落 |
| 2. sweat | <i>n.</i> | 汗水 | 12. insect | <i>n.</i> | 昆虫 |
| 3. lack | <i>n.</i> | 缺乏 | 13. ladybug | <i>n.</i> | 瓢虫 |
| 4. adapt | <i>v.</i> | 适应 | 14. chew | <i>v.</i> | 咀嚼 |
| 5. soak | <i>v.</i> | 吸收 | 15. burrowing owl | | 穴鸱 |
| 6. drought | <i>n.</i> | 干旱 | 16. black-footed ferret | | 黑足鼬 |
| 7. pollen | <i>n.</i> | 花粉 | 17. lizard | <i>n.</i> | 蜥蜴 |
| 8. graze | <i>v.</i> | 啃食牧草 | 18. spider | <i>n.</i> | 蜘蛛 |
| 9. badger | <i>n.</i> | 獾 | 19. cozy | <i>adj.</i> | 暖和舒适的 |
| 10. burrow | <i>n.</i> | 地洞 | 20. abandoned | <i>adj.</i> | 被遗弃的 |



forest

Interesting Questions . . .

Q: Pronghorns can run 97 kilometers per hour (about 60 miles per hour), and jackrabbits can run 72 kilometers per hour (about 45 miles per hour). Why might prairie animals need to run faster than forest creatures⁷?

A: On the prairie, there's nowhere to hide from a hungry coyote or another predator⁸. So animals need to be able to speed way.

Q: Is shortgrass the only type of prairie in North America?

A: No. The height of prairie grass is linked to the amount⁹ of rainfall¹⁰. In the rainy eastern sections¹¹, some species of grasses grow 2 or 3 meters (about 7 to 10 feet) high on the tallgrass prairie¹². Farther west, tall grasses blend with shorter species on the drier mixed-grass prairie¹³. Still farther west lies the shortgrass prairie. (See map on page 11.)

- | | | | |
|-------------|---------|-------------------------|--------|
| 1. claw | 爪 | 9. amount | 数量 |
| 2. coyote | 丛林狼, 郊狼 | 10. rainfall | 降雨 |
| 3. exit | 出口 | 11. section | 地区 |
| 4. tense | 变得紧张 | 12. tallgrass prairie | 北美高草原 |
| 5. spring | 跳, 跃 | 13. mixed-grass prairie | 混草北美草原 |
| 6. flee | 逃走 | | |
| 7. creature | 生物, 动物 | 14. pup | 幼崽 |
| 8. predator | 捕食者 | | |

Coyote pup¹⁴



Habitat¹, Sweet Habitat

In your home, you find what you need to survive: food, water, dry land, air, and temperatures that don't make you freeze or boil². A wild plant or animal finds everything it needs in its habitat. Even the harshest environment can be a perfect place for some plants and animals to live.

The prairie has hot summers and cold winters. So how do plants survive this range³ of temperatures, harsh winds, and dry soil? Adaptations⁴ help them survive. Prairie plants send roots deep and wide so that they can soak up moisture⁵ and stand firm in the wind. The thick tangles⁶ of roots hold soil so that it doesn't blow away. They hold so tightly that settlers⁷ used to slice⁸ out blocks⁹ of dirt called sod¹⁰—held together by roots—and use them like bricks¹¹ to build houses.

If they lose too much of their habitat, populations—plants and animals of the same species in a certain area—are

reduced¹² in number. And that's just what happened as the *human* population grew in prairie regions¹³. When settlers crossed the nation in the 1800s, they began to turn large areas of the prairie into farms and cattle¹⁴ ranches¹⁵.

Today much of the prairie has been turned into commercial¹⁶ farmland. And many cities and towns have spread across what was once open grassland. In some states, as much as 90 percent has been lost over the past 150 years.

1. habitat	<i>n.</i>	栖息地
2. boil	<i>v.</i>	沸腾
3. range	<i>n.</i>	幅度；范围
4. adaptation	<i>n.</i>	适应性的变化
5. moisture	<i>n.</i>	湿气；水分
6. tangle	<i>n.</i>	纠结的一团
7. settler	<i>n.</i>	早期开拓者
8. slice	<i>v.</i>	切开
9. block	<i>n.</i>	大块
10. sod	<i>n.</i>	草皮
11. brick	<i>n.</i>	砖
12. reduce	<i>v.</i>	减少；缩小
13. region	<i>n.</i>	地区
14. cattle	<i>n.</i>	牛
15. ranch	<i>n.</i>	大牧场
16. commercial	<i>adj.</i>	商业的

Settlers who farmed the prairie in the 1800s often built their houses of the tough prairie sod.



Finding a Niche¹

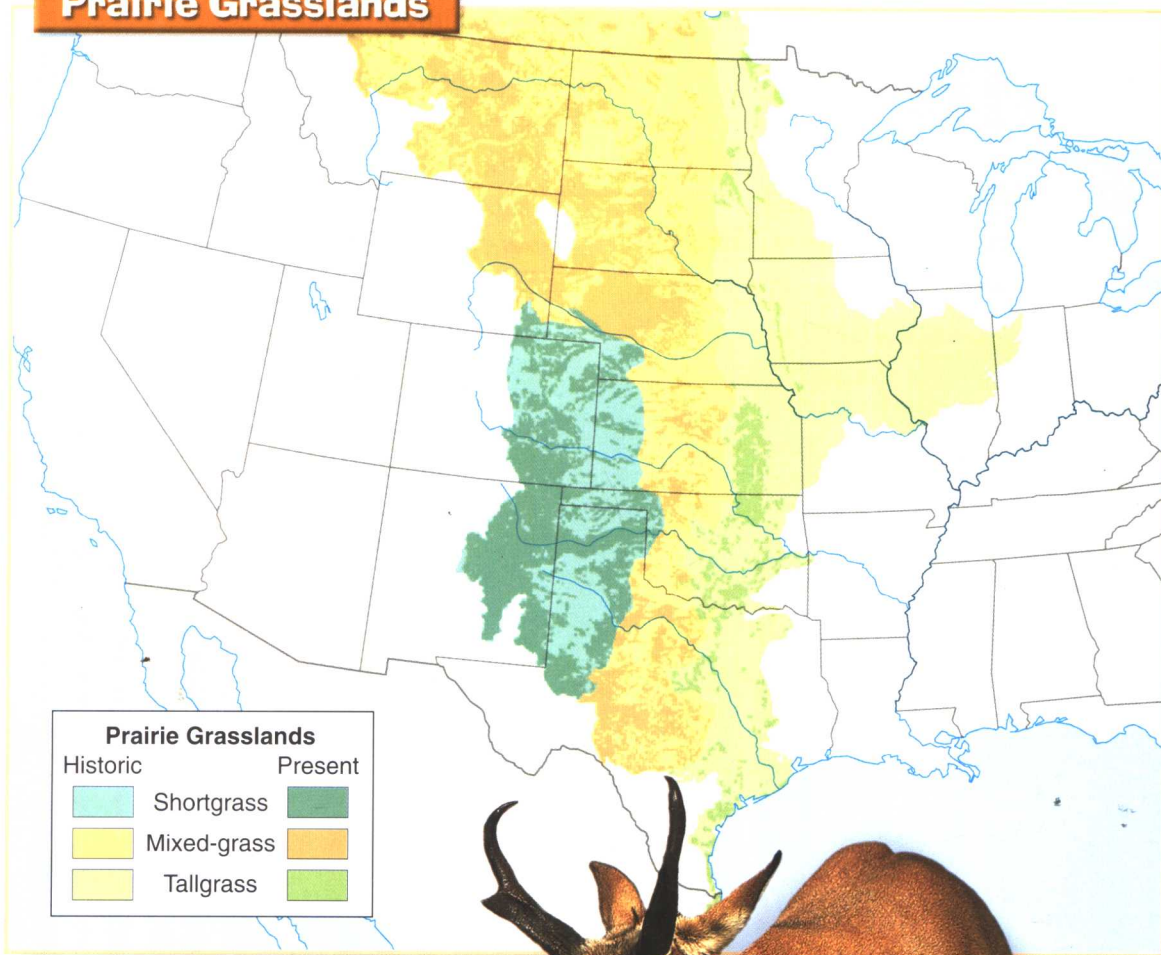
Each species in an ecosystem performs² a special function³, or role. That role is called a niche. A niche includes everything that a species eats, as well as when a species sleeps and where it lives.

No two animals have the same niche. For example, both bison and pronghorn graze

on prairie plants, and both are part of the same community. However, the bison eats grass and the pronghorn eats a plant called sage⁴. Each animal occupies⁵ a different niche and doesn't compete⁶ with the other.

- | | | |
|-----------------------|----|--------|
| 1. niche | n. | 生态位 |
| 2. perform | v. | 施行 |
| 3. function | n. | 作用 |
| 4. sage | n. | 鼠尾草属植物 |
| 5. occupy | v. | 占有 |
| 6. compete | v. | 竞争 |
| 7. pronghorn antelope | | 北美叉角羚 |

Prairie Grasslands



Pronghorn antelope⁷

Changing and Staying the Same

Ecosystems tend¹ to stay in balance even when conditions change. For example, in warm, dry years, grasshopper² populations may soar³ until the prairie hops⁴ with up to 30 of them per square meter (square yard). Then, birds, mice, coyotes, and other predators have a feast⁵. They munch the big green insects and soon the grasshopper population drops again. The system stays in balance.

Ecosystems can regain their balance even after huge changes, such as those caused by fire. In fact, fires clear away invading⁶ trees and shrubs⁷. Fires also clear away the dead plants that pile up on the soil. Grasses and native⁸ prairie plants survive. The system stays in balance.

Native plants have adapted to survive destructive⁹ fires. Many grasses can grow again from underground roots or stems after a wildfire. Bolts of lightning¹⁰ have been setting off prairie fires for thousands of years. Native Americans also learned to set prairie fires. They knew that tender¹¹ green grass would grow back, attracting¹² the bison. They also knew that the mix of grazing animals, fire, and climate kept the prairie healthy.

1. tend	v.	趋向
2. grasshopper	n.	蚱蜢；蝗虫
3. soar	v.	猛增
4. hop	v.	跳跃
5. feast	n.	盛宴
6. invade	v.	入侵；侵占
7. shrub	n.	灌木
8. native	adj.	本土生长的
9. destructive	adj.	破坏的
10. bolts of lightning		闪电；霹雳
11. tender	adj.	嫩的
12. attract	v.	吸引



Bigger Changes

Once there were wolves and grizzly bears¹ on the prairie. Wolves sometimes kill cows and dogs. Grizzly bears may attack humans. So settlers hunted these animals and took over their habitat. Wolves and grizzlies were eventually² in danger of becoming extinct³. Now scientists are working to help increase the size of these populations.

Prairie dogs still have a hard time in the United States. Ranchers⁴ fear that prairie dogs eat too much of their cattle's grass. So they shoot and poison⁵ prairie dogs, severely reducing their numbers. This has nearly wiped out black-footed ferrets, which rely on prairie dogs for food and energy.

Some animals manage to live with humans better than others do. As people took over their habitat, coyotes changed their diets⁶ to include garbage⁷, as well as insects and other small animals found in lawns⁸ and gardens. Coyotes have adapted so well that their habitat has actually increased in the past hundred years. They were once found only in the West, but now they thrive⁹ in every state except Hawaii¹⁰.

1. grizzly bear		灰熊
2. eventually	<i>adv.</i>	最终
3. extinct	<i>adj.</i>	灭绝的
4. rancher	<i>n.</i>	大牧场主
5. poison	<i>v.</i>	毒死
6. diet	<i>n.</i>	日常食物
7. garbage	<i>n.</i>	垃圾; 食物下脚
8. lawn	<i>n.</i>	草坪
9. thrive	<i>v.</i>	茁壮成长
10. Hawaii		夏威夷州



Pass the Energy, Please

请传递能量

You're a member of the Lakota Indian tribe¹ in South Dakota². Today you're riding your horse out onto the prairie to check on your herd³ of bison. Your tribe has more than 3,000 of the huge animals. You count many baby bison trailing⁴ their mothers.

(注释见第 15 页)

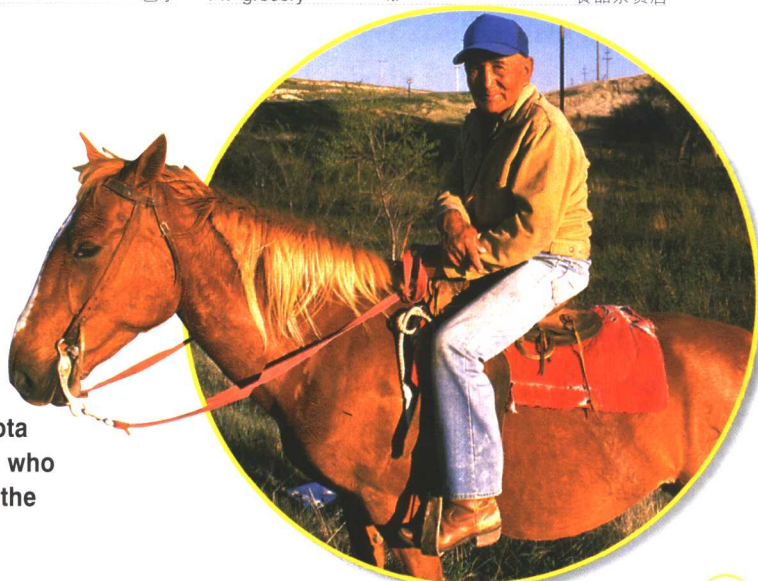


In the past, your tribe depended on bison for meat and more. Men and women sewed⁵ skins⁶ into shoes and blankets⁷. They melted⁸ bison fat to make soap and boiled hooves⁹ to form glue¹⁰. Tribe members even carved¹¹ bones into tools, such as scrapers¹² to clean bison skin.

In the late 1800s, European settlers killed most of the bison. Across North America, the bison population fell from more than 50 million in 1800 to *one thousand* in 1900. Many Native Americans starved¹³ to death. Today your Lakota friends and family get much of their energy from the food they buy at the grocery¹⁴ store. But Native Americans have also started to eat bison again. Fifty Native American tribes are working together to bring thousands of bison back to the prairie.

Every population in an ecosystem needs energy from food to survive. And some populations are themselves food for others.

1. Lakota Indian tribe	拉科塔的印第安部落	8. melt	v.	使熔化
2. South Dakota	南达科他州	9. hoof	n.	蹄
3. herd	n. 牧群	10. glue	n.	胶
4. trail	v. 跟随	11. carve	v.	削, 砍, 凿
5. sew	v. 把……缝入	12. scraper	n.	刮刀
6. skin	n. (兽)皮	13. starve	v.	挨饿
7. blanket	n. 毯子	14. grocery	n.	食品杂货店



A member of the Lakota tribe, one of 50 tribes who are bringing bison to the prairie.