

# THE ROCKY MOUNTAIN LOCUST

## Extinction and the American Experience

by

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Immigration into the American west was happening at a rapid pace as settlers from the eastern U.S. and Europe headed to the west coast and the Rocky Mountains in search of gold and silver and their American dream. Some of those wayward travelers ended up homesteading in places such as Nebraska, Colorado, Iowa, the Dakotas, and Minnesota. This was the Great Plains—open, continuous grasslands, as far as the eye could see. In the eastern portion was the tall grass prairie, with grasses such as big blue stem that often reached heights of eight or nine feet. The western edge butted against the Rocky Mountains and was known as the short grass prairie, with grasses such as Buffalo grass growing usually less than a foot tall.

The Great Plains, as many settlers found, was a land of weather extremes. Brutal winters with recurring blizzards and temperatures dipping well below zero alternated with extreme summertime heat, often in excess of 100°F, which dried up the land. And there was the wind, the perennial wind that never stopped blowing. Wind chills in the winter often caused instant frostbite. When combined with the summer heat, the wind blew so hot and dry it scorched the earth.

The Great Plains was also a land of arresting beauty. George Catlin, an early 19<sup>th</sup>-century artist, was inspired to paint many pictures of the prairie, and considered the prairies America's true landscape. Catlin called for a government policy that would create a "nation's park, containing man and beast, in all the wild and freshness of their nature's beauty" (Tallgrass Historians L.C., 1998).

### **They Came**

Homesteaders came from the east, locusts came from the west, and they met in the Great Plains.

The prairie habitat provided new opportunities for agriculture. The prairie soils were deep and rich for farming. The U.S. government promoted post-Civil War settlement of the Great Plains. Americans, as well as many Europeans, jumped at the opportunity for free land to homestead and a future in farming.

But they ran into a problem—the destruction of their crops by massive swarms of the Rocky Mountain Locust, *Melanoplus spretus*. This species of grasshopper maintained its permanent range in the Rocky Mountains, but when its population fluctuated, the Rocky Mountain Locust expanded its range well into the Great Plains. The final swarms peaked from 1873-1877 at the same time that masses of European migrants were flooding the Great Plains.

Figure 1  
Breeding grounds of the Rocky Mountain Locust, *Melanoplus spretus*  
  
 (Source: U.S. Entomological Commission 1880)



One eyewitness account of the interaction between the homesteaders and the locusts comes from Laura Ingalls Wilder, author of the *Little House on the Prairie* series which chronicles life in the mid-1880s on the Great Plains. In her book *On the Banks of Plum Creek*, she describes the intensity of these locust swarms:

*... A cloud was over the sun. It was not like any cloud they had ever seen before. It was a cloud of something like snowflakes, and thin and glittering. Light shone through each flickering particle.*

*There was no wind. The grasses were still and the hot air did not stir, but the edge of the cloud came across the sky faster than the wind. The hair stood up on Jack's neck. All at once he made a frightful sound up at that cloud, a growl and a whine.*

*Plunk! Something hit Laura's head and fell to the ground. She looked down and saw the largest grasshopper she had ever seen...*

*The Cloud was hailing grasshoppers. The cloud was grasshoppers. Their bodies hid the sun and made darkness. Their thin, large wings gleamed and glittered. The rasping whirring of their wings filled the whole air and they hit the ground and the house with the noise of a hailstorm.*

The largest of the swarms covered a “swath equal to the combined areas of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island and Vermont” (Riley et, al., 1880).

## **They Devastated**

“Every vegetable, every weed and blade of grass bore its burden...” (Evans 1966).

The grasshoppers ate and ate; they devoured everything from barley and buckwheat to spruce and tobacco. The locusts even ate blankets that women put over the crops to protect them. A few records report the locusts eating fence posts, leather, dead animals, and sheep wool. Cannibalism was also observed. One common comment was that “grasshoppers ate everything but the mortgage” (Evans, 1966; Atkins, 1984).

The homesteaders relentlessly plowed and plowed, converting countless acres of prairie to crops, but much of this was quickly converted to food for the locusts. One report from 1874 (Evans 1966) suggested, “...only one family in 10 has enough provision to last the winter” and later wondered if the settlement of the prairie was a mistake. One homesteader stated (from Atkins 1984), “wheat and grasshoppers could not grow on the same land, and the grasshoppers already had the first claim.”

Many homesteaders were held hostage. Some left, but many were unable to. From Atkins (1984):

*Southwestern Minnesota lost settlers during the dark days of the 1870's, those who up and left, permanently and temporarily, as well as those who never arrived, but thousands remained. Some could afford to stay; some could not afford to leave. Debts held some. Others wanted to hold on to their investments of time and energy. Some felt different attachments; as one man explained “I have lost my all here and somehow I believe that if I find it again, it will be in the immediate neighborhood of where I lost it.” More important he wrote, “I have a child buried on my claim, and my ties here are stronger and more binding on that account.”*

In 1876, Minnesota Governor John S. Pillsbury chose not to request relief for those impacted by the locusts as he had in prior years, with the state legislature killing numerous bills that would have provided some form of aid to the hopper-stricken. The state legislature did pass two bills that asked the federal government to fund bounties for grasshopper destruction. Minnesota never petitioned the federal government for direct aid. Aid did come in indirect forms though; in 1874, the federal government exempted the grasshopper sufferers from “residency requirements.” This act allowed homesteaders to briefly leave their land to work elsewhere. In 1875, the federal government released \$30,000 to distribute seeds to farmers in the Great Plains affected by the locust plagues.

## **And Then the Locusts Were Gone—For Good**

Devastated by the volume and intensity of the locust swarms, many homesteaders moved back to the city or elsewhere. Farming was over for many and their fortunes were lost. But in spite of the devastation by the locusts, immigrants continued to pour into the west.

Another excerpt from Laura Ingalls Wilder from a later chapter in *On the Banks of Plum Creek* describes the impression of these locust swarms as they were leaving:

*...Across the dooryard the grasshoppers were walking shoulder to shoulder and end to end, so crowded that the ground seemed to be moving ...*

*...Grasshoppers were walking over Carrie. They came pouring in the east window, side-by-side, end-to-end, across the window sill and down the wall and over the floor.*

*...That whole daylong the grasshoppers walked west. All the next day they went on walking west. And on the third day they walked without stopping.*

*...They walked steadily over the house. They walked over the stable. They walked over Spot until Pa shut her in the stable. They walked into Plum Creek and drowned, and those behind kept on walking in and drowning until the dead grasshoppers choked the creek and filled the water and live grasshoppers walked across them.*

*...The fourth day came and the grasshoppers went on walking. The sun shone hotter than ever, with a terribly bright light. It was nearly noon when Pa came from the stable shouting: "Caroline! Caroline! Look out doors! The grasshoppers are flying."*

This represented the last stand of the Rocky Mountain Locust on the Great Plains, and no major swarms were recorded again in the Great Plains. The last specimens collected were recorded from southern Canada in 1902.

No one knows for sure exactly what happened to this locust, but **Lockwood and DeBrey's (1990)** primary conclusion was that the breeding grounds in the permanent range were destroyed by agriculture and grazing of livestock. These locusts were forever gone, yet the homesteaders remained, steadily increasing their population throughout the Great Plains.

Now, over 135 years later, we learn the rest of the story. The locusts are extinct, and for all practical purposes, the prairie that once covered over 250 million acres of the central U.S. is almost gone as well. In Minnesota (18 million acres original prairie, 12,000 acres remain) and Iowa (30 million original prairie acres, 20,000 acres remain), less than one percent of what once was still remains. Just as we can find glacial remains of the locust (Figure 2), we can also find postage-stamp remnants of this greatly endangered ecosystem. Numerous local, state, and federal agencies are investing millions of dollars to restore and reconstruct the pre-settlement prairie. These remnants often contain 100 or more species of plants and another order-of-magnitude of other organisms that are dependent on this ecosystem.

**Figure 2**  
Mummified Rocky Mountain Locust collected from glacial deposit.  
Photo courtesy of J. A. Lockwood



## Notes to the Reader about Basic Grasshopper Biology

Think of grasshoppers and locusts in a behavioral continuum. When they are non-damaging and non-migratory, with a low-density dispersed population, they are considered grasshoppers. When they are both damaging and migratory with a high-density concentrated population, they are considered locusts ([Thopal, 2002](#)).



## Questions for Discussion

### Set 1. Social Responsibility

1. What responsibility did the government have to protect farmers and ranchers from outbreaks of pest species such as the Rocky Mountain Locust? (See [Atkins, 1984](#); Chapters 7 and 8.) Is this a local, state, or federal issue?
2. What would appropriate aid look like? Reflect on your observations from recent natural disasters.

### Set 2. Extinction

1. The Rocky Mountain Locust is now extinct, and represents the only example in the world of an endemic pest species that has gone extinct in the history of agriculture. What lessons can we learn from this? (See [Lockwood, 2001](#).)
2. Is it a good thing for species to go extinct, even if they were considered a pest? Define your moral guidelines for an appropriate extinction.
3. There are no Rocky Mountain Locusts left. Did the homesteaders win or lose?
4. One hundred years after the last known collection of this species (1902, in Canada), we still ponder the reason for the extinction of this species (see [Lockwood and DeBrey, 1990](#)). The leading hypothesis is loss of breeding habitat. Are there other hypotheses you might be able to generate as to the cause of their extinction?

### Set 3. Conservation Issues

1. There is an effort among some scientists to bring back species from extinction. Would we want to bring the Rocky Mountain Locust back from extinction if we could? Why or Why not?
2. Are restorations complete if we don't bring all of the species back? If we don't, do we possibly create an "illusion" to the general public of what the environment may have been like prior to settlement by an agrarian society?
3. Why bother with restoration at all?

## Literature Cited

- Atkins, A. 1984. Harvest of Grief: Grasshopper plagues and public assistance in Minnesota. St Paul, Minn.: Minnesota Historical Society Press.
- Evans, H.E., 1966. "Year of the Locust" from *Life on a Little Known Planet*, New York: Dutton.
- Lockwood, J.A., and L. D. DeBrey. 1990. A Solution for the Sudden and Unexplained Extinction of the Rocky Mountain Grasshopper (Orthoptera: Acrididae). *Environmental Entomology* 19:1194-1205.
- Lockwood, J.A. 2001. Voices from the Past: What we can learn from the Rocky Mountain Locust. *American Entomologist* 47: 208-215.
- Riley, C.V., A.S. Packard, Jr., and C. Thomas. 1880. Second report of the United States Entomological Commission. Washington, DC: Government Printing Office.
- Tallgrass Historians L.C. 1998. *Tallgrass Prairie National Preserve Legislative History, 1920-1996—Administrative History*. Prepared by Tallgrass Historians L.C. for the National Park Service.  
[http://www.cr.nps.gov/history/online\\_books/tapr/index.htm](http://www.cr.nps.gov/history/online_books/tapr/index.htm)
- Thoopal R. K. 2002. Why do Locusts Swarm?  
<http://www.pitara.com/discover/5wh/161.htm>
- Wilder, Laura Ingalls. 1937. *On the Banks of Plum Creek*. New York: Harper Collins Publishers.

## Supplemental Reference Material

- Chapco, W., W.R. Kuperus and G. Litzenberger. 1999. Molecular phylogeny of melanopline grasshopper (Orthoptera: Acrididae). The genus *Melanoplus*. *Ann. Entomol. Soc. Am.* 92: 617-623.
- Custer National Forest  
<http://www.fs.fed.us/r1/custer/recreation/grasshopper.shtml>
- Lockwood, J. A. 1989. Taxonomic Status of the Rocky Mountain Locust: Morphometric Comparisons of *Melanoplus spretus* (Walsh) With Solitary and Migratory *Melanoplus sanguinipes* (F.). *The Canadian Entomologist* 121:1103-1109.
- Lockwood, J.A., J.C. Burne, L.D. DeBrey, R.A. Nunamaker and R.E. Pfadt. 1990. The preserved fauna of grasshopper glacier (Crazy Mountains, Montana): Unique insights to Acridid biology. *Bol. San. Veg. Plagas* (Fuera de serie) 20:223-236.
- Lockwood, J. A., S. P. Schell, J. K. Wangberg, L. D. DeBrey, W. G. DeBrey and C. R. Bomar. 1992. Preserved Insects and Physical Condition of Grasshopper Glacier, Carbon County, Montana, U.S.A. *Arctic and Alpine Research* 24:229-232.
- Lockwood, J. A., C. D. Thompson, L. D. DeBrey, C. M. Love, R. A. Nunamaker and R. E. Pfadt. 1991. Preserved Grasshopper Fauna of Knife Point Glacier, Fremont County, Wyoming, U.S.A. *Arctic and Alpine Research* 23:108-114.

- Lockwood, Jeffrey A., Richard A. Nunamaker, Robert E. Pfadt, and Larry D. DeBrey. 1990. Grasshopper Glacier: Characterization of a vanishing biological resource. *American Entomologist* 36:18-27.
- Rocky Mountain Locust Plague: A Natural Tragedy Stalls the Triumph of the Plow. [http://www.nationalhistoryday.com/03\\_educators/teacher/rockymt.htm](http://www.nationalhistoryday.com/03_educators/teacher/rockymt.htm)
- The SER Primer on Ecological Restoration A Publication of the Science & Policy Working Group. April 2002 (First Edition) ©2002 Society for Ecological Restoration International. <http://www.ser.org/reading.php?pg=primer1>
- Yoon, C. K. 2002. What plagued the locust? St. Paul Pioneer press. April 28, p.4A.

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