

PROBLEM-BASED LEARNING  
IN THE SCIENCES

# Ferret It Out

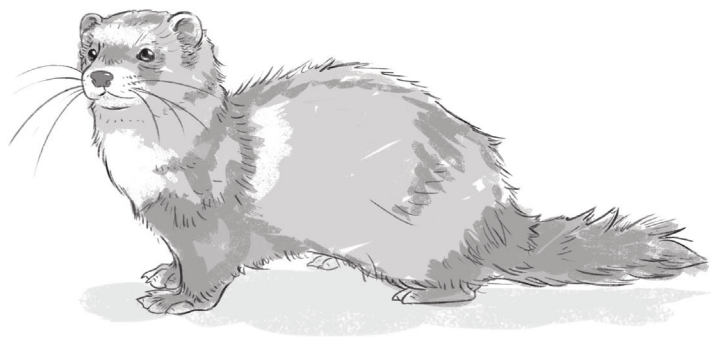
A Problem about Endangered  
Species and Animal Ecosystems

NAGC Curriculum Award-Winner

## Teacher Manual

Shelagh A. Gallagher

Dana L. Plowden



Royal Fireworks Press  
Unionville, New York

# Problem Narrative:

## The Storyline for *Ferret It Out*

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*Ideally, the direction of a Problem-Based Learning unit is decided through the questions students ask. To some extent, this is made manageable by the structure of the opening scenario presented during Problem Engagement. The opening scenario is carefully designed to point students in the direction of some predictable questions. For example, it would be hard to avoid asking why the black-footed ferret is endangered, what would constitute an ideal habitat, or why the “human climate” is an issue. The narrative below and the lesson plans in this unit respond to these more predictable questions and address other desirable learning outcomes. They also provide a helpful guide for teachers new to PBL. Experienced PBL teachers are encouraged to use this unit as a framework, selecting lessons that fit the students’ questions (and, as above, many should fit) and adding other lessons to address other questions.*

### Problem Engagement

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The students are in the stakeholder role of members of the Black-Footed Ferret Recovery Reintroduction Team (BFFRRT). They are tasked with creating a model habitat for the black-footed ferret using Fort Collins, Colorado, as a test site. The team receives a memo from their boss complaining that interest in the black-footed ferret is waning. Attached to the memo is a newspaper with an article about the black-footed ferret that validates those fears. (While the team members probably will not recognize it yet, a majority of the other articles in the newspaper also connect to the problem of reintroducing black-footed ferrets, making this newspaper a useful touchstone throughout the unit.) The team must research the critical elements necessary for successful reintroduction of black-footed ferrets, create a model for reintroduction, and give their presentation to members of the BFFRRT Project Oversight Committee.

#### ***Questions Students Should Ask***

- Why do black-footed ferrets need to be reintroduced?
- What is the Black-Footed Ferret Recovery Reintroduction Team, and what is its goal?
- What are the critical habitat elements needed for successful reintroduction?
- What, if anything, needs to change about the test site before reintroduction can begin?
- What needs to be considered to account for possible changes to the black-footed ferret as a result of the genetic bottleneck?
- What needs to be included in the model?

### Inquiry and Investigation

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Students research the various learning issues associated with the problem. As they work, they begin to gain a greater understanding of the genetic fragility of the black-footed ferret and the complex ecosystem in which it lives. During this phase of the problem, students could participate in an optional simulation modeling a genetic bottleneck, as well as a math exercise estimating the number of prairie dogs and acreage required to support the recovering black-footed ferret population.

The need for a substantial prairie dog population opens the door to another dimension of the problem, euphemistically referred to in the opening scenario as the “human climate.” Ranchers are not fond of prairie dogs because they believe that prairie dogs interfere with cattle grazing. Students have a chance to test this belief through their research. Threats such as disease or invasive prairie grass become yet another dimension of the problem.

Once their research is complete, students participate in an activity designed to help them understand the critical habitat elements necessary for the black-footed ferret's survival, and also the impact of the multiple threats to the black-footed ferret. They use the concept of *systems* to guide their thinking in this analysis.

### ***Questions Students Should Ask***

- What are the critical habitat elements needed for successful reintroduction?
- What, if anything, needs to change about the test site before reintroduction can begin?
- What needs to be considered to account for the fragility of the black-footed ferret?
- What impact does the genetic bottleneck have on successful reintroduction?
- What are other potential threats to the black-footed ferret?
- What needs to be included in the model?

### ***Content Students Should Encounter***

- The genetic bottleneck caused by the reduced number of black-footed ferrets could make them weaker.
- Despite years of effort, only a small percentage of black-footed ferrets survive after being released into the wild.
- Black-footed ferrets are more likely to survive if they are released when they are younger.
- The reintroduced black-footed ferrets do not travel more than a few miles for food.
- Evidence is emerging that the recovered black-footed ferrets have weakened immune systems, requiring easier access to food and greater protection from prey.
- Black-footed ferrets cannot survive without an ample population of prairie dogs.
- The prairie dog population was reduced by more than 90% as large ranches moved into the prairie.
- Prairie dog towns can be wiped out by bubonic plague, the same plague that wiped out a sizable portion of the European population in the 1340s. (Human treatments have improved since then, and in the rare instances when people contract plague today, they almost always survive.)
- Prairie dogs are a *keystone species*: many species are dependent on the prairie dog for survival, not just black-footed ferrets.
- Humans have negative attitudes toward prairie dogs. Prairie dogs are poisoned and hunted ("plinked") to get rid of them. Fear of catching the plague contributes to the negative attitudes.
- Pet dogs and cats can contract bubonic plague from a prairie dog.
- Cheatgrass is one of many non-native invasive grasses that are changing the composition of the shortgrass prairie (a biome), making the prairie more vulnerable to extreme and damaging wildfires.

## **Problem Definition**

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Students examine the cause-and-effect relationships among critical elements of the problem. In the process, they narrow down the many issues uncovered during research to the core issues. As they examine the core sources of the problem, they also identify constraints in the problem that limit their solution options. In the process, they come to recognize that the problem is as much about the prairie dog as it is about the black-footed ferret. Once they have created their problem definition, the students respond to a memo from their boss asking for a progress report.

### ***Questions Students Should Ask***

- Which aspect(s) of the problem are immediately responsible for black-footed ferrets having trouble surviving?
- What makes (x) the immediate cause?
- If (the genetic bottleneck) is immediately responsible for the black-footed ferret having a fragile genetic makeup, which aspect is immediately responsible for (the bottleneck)?

### ***Content Students Should Encounter***

- Black-footed ferret survival is dependent on prairie dog survival.
- Black-footed ferrets need prairie dogs living close together—it's not enough to have a large number of prairie dogs if they are spread too far apart.
- The cheatgrass invasion is due in part to a fragile prairie biome. The biome is fragile in part because of overgrazing.
- While cattle grazing contributes to the problem, it is also integral to the economy of the region.
- Two or three issues are at the heart of the problem: (1) overuse of land by humans, (2) near destruction of the prairie dog population, and (3) drought.

## **Problem Resolution**

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Another memo from the boss arrives thanking the team members for their work to date and urging them to turn their attention to building the model of a suitable habitat. Students conduct some last-minute research and spend time constructing their model and presentation. As they work, they need to keep in mind all of the information they have gathered from their research, taking into account the needs of the black-footed ferret, as well as the needs of the ranchers and any other constraints that may exist. Students may need to develop a public relations plan to persuade local landowners to accept their plan. At the end of these lessons, students present their finished model to the BFFRRT Project Oversight Committee.

### ***Questions Students Should Ask***

- What are the critical habitat elements needed for successful reintroduction?
- What, if anything, needs to change about the test site before reintroduction can begin?
- What needs to be considered to account for the fragility of the black-footed ferret?
- What needs to be included in the model?

## **Problem Debriefing**

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Students review what they have learned and reflect on the problem-solving process. A variety of activities are recommended for Problem Debriefing, including an analysis of the minutes of a real community meeting from Fort Collins that discusses issues involving the black-footed ferret and the prairie dog. Students are encouraged to see the universality of the concepts and generalizations presented in the unit, especially the importance of balance and proportion in a system.

# Problem Engagement




## *Black-Footed Ferret Recovery Reintroduction Team*

### Goals:

- Introduce students to the problem.
- Help students identify important questions.
- Develop issues on the Learning Issues Board.
- Prioritize learning issues.

**Grouping:** Pairs for think-pair-share activity; whole group for discussion

**Generalization:** Elements of a system all must function correctly or the system will break down.

 <b>Materials</b>	 <b>Problem Log</b>	 <b>Teacher Reference</b>
<p><b>Included in Unit</b></p> <ul style="list-style-type: none"> <li>• Memo from Dr. Ladner</li> <li>• <i>The Fort Collins Coloradoan</i> newspaper</li> <li>• Notes about the Problem</li> <li>• Learning Issues Board</li> <li>• Reflective Moment</li> </ul> <p><b>Additional Materials</b></p>	<ul style="list-style-type: none"> <li>• Notes about the Problem</li> <li>• Learning Issues Board</li> <li>• Reflective Moment</li> </ul>	<ul style="list-style-type: none"> <li>• Sample Learning Issues Board</li> </ul>

### Summary:

Students receive the opening scenario that introduces the problem. A memo arrives from Dr. Mitchell Ladner, the (fictitious) head of the U.S. Fish and Wildlife Service. In the memo, Dr. Ladner informs the team that public support for the black-footed ferret is diminishing, making improved progress imperative. The students are urged to demonstrate the viability of a new reintroduction site for the black-footed ferret. Students complete the Learning Issues Board and establish research priorities.

*Notes: Before this lesson, make a few copies of the issue of The Coloradoan newspaper. The Coloradoan is filled with articles related to the problem, but it is unlikely that students will understand the relevance of all of the articles at this stage of the problem. After students conduct their initial research, they will begin to understand the relevance of the news articles as they work toward accomplishing their goals.*

*Contemporary scientists often work in interdisciplinary teams. An element of authenticity can be added to the problem by assigning students different roles on the BFFRRT. Some students could focus on reproduction, others on acclimating young kits to the natural environment, and still others on releasing black-footed ferrets back onto the prairie.*

## Things to Do Before Class:

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1. Read through the materials in the opening scenario, and consider what questions to ask to draw out issues directly associated with the problem.
2. Download, print, and make copies of the memo from Dr. Ladner and *The Coloradoan* newspaper.
3. Prepare a Learning Issues Board on a whiteboard, smartboard, or LCD projector for whole-class discussion.
4. Use the website resources in Appendix B to prepare folders of information that students can use to begin their research at the end of class, time permitting.

## Things to Do During Class:

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1. Introduce the problem by pretending that it is just another day at the lab, saying something like, “Okay, team, we have an important task in front of us. Here is an update from Dr. Ladner.” Pass out the memo from Dr. Ladner, and ask them to read it. Students should ask about the article in the *The Coloradoan*; when they do, give a copy of the newspaper to a few of them. Then give them time to read and report information from the article to the class. This will help establish two good habits. First, students will learn that they receive information only when they ask for it, and second, they will learn to rely on each other for important information. Leave a few copies of the newspaper around the classroom after this lesson for students to refer to as they work on the problem.
2. Have students conduct a think-pair-share activity in which they pair up and use the Notes about the Problem page in their Problem Logs to record facts from the memo that seem particularly important. They could also use the Learning Issues Board in their Problem Logs to record their hunches about what’s going on, as well as any learning issues that arise.
3. Circulate throughout the room to give guidance as students work. Should students request a copy of a map of Fort Collins, direct them to Google Maps or another internet mapping service, or consider displaying a map for the whole class on a smartboard or whiteboard.
4. As a whole group, have students share what they know and what they want to know more about after reading about the problem. Record student responses on the class copy of the Learning Issues Board. Have the students copy the information into the Learning Issues Board in their Problem Logs.

## Key Questions:

- *What seems to be our job? What’s our role?*
- *What seems to be going on? Why is Dr. Ladner concerned?*
- *What terms in this memo need clarification?*
- *What information makes you think that... (i.e., something is wrong with the black-footed ferret)?*
- *What do you suppose our responsibilities are?*
- *What about the memo makes you curious?*

5. After students have finished listing their learning issues, direct them to engage in another think-pair-share to identify the two or three questions they need to answer first in order to make progress. As a class, discuss the students’ rankings, expanding the list to include five top-priority questions.

6. Help the students develop a plan of action to find the answers to their high-priority questions. Encourage them to think beyond using the internet as a means of conducting research. Prompt them to consider who they could interview, what visual resources they could use (including maps), or what other ways they could learn about the problem.

**Key Questions:**

- *What three questions have to be answered first so that we can make good progress?*
- *How should we go about finding answers to these questions?*
- *Where do scientists turn for answers to their questions?*
- *Where do they go to find out what is already known?*

7. If time permits, ask students to select one of the priority questions to research. As class draws to a close, have them complete the first Reflective Moment in their Problem Logs.



**Department of the Interior**  
**U.S. Fish and Wildlife Service**

To: All Team Members, Black-Footed Ferret Recovery Reintroduction Team (BFFRRT)  
From: Mitchell Ladner, U.S. Fish and Wildlife Service  
Subject: Fort Collins Project

Progress on the reintroduction of the black-footed ferret into natural habitats is not moving quickly enough. Already there is media coverage suggesting that attempts to save the black-footed ferret are too expensive and too labor-intensive, given our minimal successes so far. Just look at the recent edition of *The Fort Collins Coloradoan*, and you'll see what I mean—the project was buried on page 4! Given the current strains on the economy, we need to make sure our efforts show decisive results.

Clearly something has to change, and that is why you have been brought together as a team. In the past we have been reactive—that is, we have responded to different problems as they have cropped up. I think it is important that we become proactive by anticipating potential problems and by creating a model of a feasible, functioning habitat that's suitable for the black-footed ferret and all other inhabitants.

We will use the Fort Collins, Colorado, region as the test site to develop our model habitat. Your job is to identify the different aspects of successful black-footed ferret reintroduction, paying particular attention to these questions:

1. How suitable is the natural habitat for black-footed ferret preservation? What, if anything, needs to change before we begin reintroduction?
2. What in particular needs to happen to the Fort Collins habitat to account for any changes the black-footed ferrets might experience as a result of the genetic bottleneck?
3. What is the nature of the "human climate" with regard to the black-footed ferret? Identify any necessary changes in that area, and provide ideas on how the changes can be made.

These questions should be enough to at least get you started, but remember, you may encounter other unexpected factors along the way. Keep track of these, and incorporate them into your model as appropriate. You will be presenting the model and findings to members of the BFFRRT Project Oversight Committee at its meeting in about two weeks.

I realize that this is a complex task, but I am confident that, given the nature and diversity of the membership of this group, you will be successful. With continued effort, the black-footed ferret will be able to once again fill its niche in the prairie ecosystem.



# Fort Collins Coloradoan

Tuesday

August 3, 2010

www.coloradoan.com

The Forecast

Sunny

High 98

Low 90

## Fire Ravages McClintock Farm

BY TAMARA ROBBINS

Scorching temperatures and drought conditions created a recipe for disaster yesterday afternoon for one of Fort Collins's oldest established ranches. Ranch hands at McClintock Farm report that just before noon, they noticed thick, black smoke trailing up from the western edge of the property. Poudre Fire Authority, along with Union Colony Fire and Rescue, were dispatched and arrived on the scene within a matter of minutes. Firefighters worked tirelessly to control the conflagration,



Fire rages through the farm, leaving grazing areas blackened.

but weather conditions were not on their side. It took more than six hours to control the blaze, and when firefighters were finally able to extinguish it, more than 2,000 acres

of land had been blackened. Captain Anthony Ramirez stated, "We tried as best we could to contain the fire quickly, but with the heat and the abundance of cheatgrass,

we were fighting an uphill battle." Ranch owner Clive Murphy said that he was thankful for the efforts of "hard-working

See FIRE/Page A3

## Plink, Poison, or Proliferate: What to Do about the Prairie Dog

BY ROSA ALVAREZ

For such a small creature, the prairie dog certainly has created quite a ruckus. The battle over what to do about the prairie dog is nothing new to the Fort Collins area. The debate has been plaguing local and federal officials for years. On one side of the argument are ranchers who

believe that prairie dogs are ruining the public land they rely on for grazing. On the other side are wildlife conservationists who assert that killing prairie dogs causes irreparable damage to the delicate prairie ecosystem. Will an understanding between the two parties ever be reached?

### What Should Be Done?

At the center of this controversy is the disagreement on the best method and need for prairie dog management. Ranchers, hunters, and other parts of the general population believe that plinking

See DOG/Page A2

## Juror's Award of Excellence Goes to Global Warming

BY WILLIAM LAWSON

Science and art merged beautifully this weekend at Colorado State University's annual Art and Science Exhibition. The exhibition, established less than a decade ago, is designed to celebrate the creativity of the CSU faculty, students, and staff and to explore

See EXCELLENCE/Page A2

## Dog -FROM A1

(or shooting) and poisoning are the most effective and inexpensive ways to control the population. Ranchers like Ronald Fischer, owner of Mabel's Way Ranch, would just like the animals to go away. Fischer said, "These rodents are everywhere. They are eating up all the fields I use for cattle grazing, they are disease-ridden, and they are just plain disgusting. Do you know how many cows have broken their legs in the holes they leave? I don't care how they get rid of them—poisoning, hunting, whatever. I say the federal government should declare open season on them."

For as strongly as ranchers feel about ridding the prairie of prairie dogs, environmentalists feel just as strongly about preserving them. They contend that poisoning prairie dogs is not only



*The debate on prairie dog population control rages on.*

inhumane, but it also negatively impacts the surrounding species. Walter Hastings, a spokesperson for the Prairie Dog Coalition, said, "Whoever said that poisoning was a more humane method of

management is full of it. The poison causes suffering. It's beyond cruel." He went on to say that, "When coyotes, hawks, and other predators get hold of a poisoned prairie dog, they are also poisoned. The negative effects on the prairie ecosystem if the use of poison continues will be far-reaching."

Other opponents of lethal prairie dog management include wildlife preservationists endeavoring to recover the endangered black-footed ferret. Tanya Marks of the U.S. Fish and Wildlife Service commented, "If the federal government continues to sanction the destruction of prairie dogs, our efforts to reintroduce the black-footed ferret will be in vain."

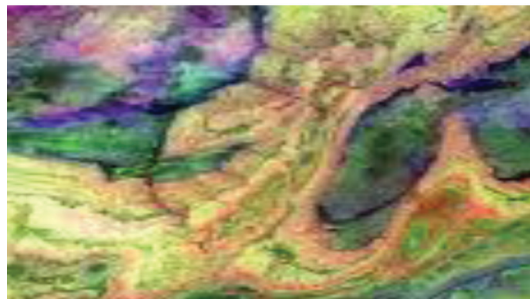
## The Debate Continues

It is unlikely that this conflict will soon be resolved, but Larimer County is working with various federal agencies in an effort to revisit the current prairie dog management policies. A spokesperson for the county stated, "We continue to investigate every possible avenue. We are soliciting input from ranchers, the Prairie Dog Coalition, the Natural Areas Program, and all other interested parties as we work to resolve this issue."

Wildlife preservationist Addison Walker added, "I'm glad that the policies are being revisited. Let's just hope change doesn't come too late."

## Excellence -FROM A1

the relationship between art and science. Each year dozens of entries are submitted, and eight awards are given. This year, senior Jake Milford's *Lost Treasure* was awarded the top prize for his interpretation of global warming effects on the prairie. Millford said that he was inspired by his love of the complexity of the prairie. "Every-



*Curfman Gallery exhibit showcases marriage of art and science.*

thing is so interconnected. Each creature is so reliant on the other. I wanted to capture the beauty of that relationship but also emphasize the

delicacy of it." He went on to say that "Everyone knows about the polar ice caps, but global warming affects us right here in our own prairie backyard, too." Award-winning entries will be displayed until the end of April at the CSU Curfman Gallery.

PHOTOS ON  
COLORADOAN.COM



## Beef Is Hit Hard

BY BILL HERRICK

The recession has affected countless industries over the last few years, and the beef industry is no exception. According to the National Cattlemen's Beef Association (NCBA), beef prices have been dropping steadily over the past few months, and the trend will continue for the foreseeable future. NCBA Spokesperson William Coker stated, "Last year we saw a slight increase in pricing, and we were optimistic that the trend would continue, but unfortunately we were wrong."



There are several well-known reasons for the plummeting prices, including the increasing price of oil and corn, but one less-known factor is the fight for cattle grazing land. Fort Collins Rancher Brevin McCoullough stated, "We are really struggling to provide high-quality beef. What people don't realize is that our herds are competing with other wildlife for food, and there just isn't enough to go around."

The primary food competitor for livestock is the black-tailed prairie dog. Ranchers have been claiming for years that the available grazing areas can't support both their cattle and these native creatures. McCoullough added, "Buyers want large animals. There is no money in selling underfed, thin cows."

NCBA members are thankful that the U.S. Fish and Wildlife Service recently revoked the prairie dogs' endangered species status but feel that the beef industry will still take time to recover. "I don't know why it took so long to realize that the prairie dog varmints aren't in any danger. We could poison or shoot them every day for ten years, and there would still be millions of them left," stated Coker. He added, "What the NCBA wants to do now is to come up with a plan to replenish our grazing land so that we don't have to sacrifice herd size in order to get the large cows we need to sell. It will take some time, but it's do-able if we can get rid of the prairie dogs."

Not everyone agrees with the NCBA's stance on prairie dogs. Wildlife preservationist Dr. Asha Bharwani commented, "It's important to remember that the prairie dog is a keystone to the prairie ecosystem. Instead of focusing simply on eradicating the prairie dog, we need to examine the problem as a whole. There are many other possible contributing factors to the decrease in forage for livestock—desertification and climate change, just to name a few." Dr. Bharwani added, "It is true that prairie dogs and cattle share the same space; however, there is some data to support the idea that while prairie dogs may reduce the quantity of forage, they actually improve the forage quality."

Unfortunately, it is unlikely that the prairie dog/rancher debate will be resolved soon. Until then, most can agree that measures need to be put in place to help the beef industry recover lost revenue.

McCoullough added, "I'm being hit pretty hard by these lower prices. I need something to be done soon, or I'll be in real trouble."

### Fire -FROM A1

firefighters." When asked what he thought caused the blaze that destroyed almost half of his usable grazing land, Murphy lashed out and said, "I blame those darned prairie dogs. I've been saying for years that they are a threat to my

fields. Now look at what's happened. We have over 500 head of cattle and 100 horses, and now I have to figure out where they are going to graze."

Officials have several theories about what caused flames to ignite yesterday, and an investigation is under way.

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**Where Northern  
Colorado moms meet:**

**Fort Collins, Loveland,  
& Windsor**



## Honey-Baked Ham Closes Down in Fort Collins, Greeley

BY COLORADOAN STAFF

The store with one primary product, ham, closed its Fort Collins and Greeley stores over the weekend, leaving Northern Colorado with no place to buy a spiral-cut honey-baked ham.

The Honey-Baked Ham Store and Café at 731 E. Harmony Road closed Sunday, and a sign on the door directs customers to the Honey-Baked Ham website, [www.honeybakedham.com](http://www.honeybakedham.com), to redeem gift cards or purchase products

online. The store at 3766-B W. 10th St., Greeley, closed Saturday.

It was not unusual for the Honey-Baked Ham store in Fort Collins to sell more than 2,000 hams at Easter, as customers flocked to the store to buy its specialty honey-



glazed, spiral-cut ham. The store is licensed with the city of Fort Collins to Jones-Montez Specialty Foods in Broomfield, owned by Carolyn Jones of Broomfield and Peter and Lila Montez of Johnstown. Phone calls to the Jones, the Montezes, and Honey-Baked Ham corporate offices were not returned by press time.

The Honey-Baked Ham company has about 400 stores nationwide, many of which are owned by franchisees.

## Recovery Program in Danger

BY KIEFER DOLLINS

Officials from the National Black-Footed Ferret Conservation Center announced yesterday that the future of the Black-Footed Ferret Recovery Program is in question due to recent budget cuts. The Center, which is located just outside of Fort Collins and was completed in 2005, plays a vital role in attempting to successfully reintroduce now almost-extinct black-footed ferrets into their native prairie habitat. The U.S. Fish and Wildlife Service uses the Conservation Center as a staging ground for reintroducing ferret kits bred in captivity into the wild. “We have found that the



*Budget issues threaten the Black-Footed Ferret Recovery Program.*

reintroduction success rate is much higher if the kits undergo preconditioning,” stated federal wildlife

biologist Angela Kim. Preconditioning means that ferrets are introduced to elements of their natural habitat such as prairie dogs and prairie dog burrows before they are released into the wild. “Black-footed ferrets and prairie dogs have an amazingly interwoven relationship. It is important to introduce kits to the prairie dogs so that they learn their role as predator without the threat of predation,” added Kim. When asked to comment on the budget crisis, Center director Harold Ramirez stated, “We are extremely frustrated with the decision that has been made about our funding.

Saving the ferrets is paramount for the survival of the prairie ecosystem as we know it.” He also said, “We are pursuing other avenues of funding, such as our *Adopt a Ferret* program, but we are not optimistic that this will make up for the deficit in the long-term.”

Center biologist Elena Craven added, “We have been fighting for the black-footed ferret for more than sixty years, and we have seen more success in recent years than ever before. We can’t stop now.”

More information on the recovery program can be found at the Black-Footed Ferret Recovery Program website: [www.blackfootedferret.org/index.htm](http://www.blackfootedferret.org/index.htm).

# There are plenty of numbers to ponder at hugely popular Colorado Marathon

BY SEAN DUFF

The Colorado Marathon, the most popular running race in Northern Colorado and one of the top events in the state, is all about numbers.

Lots of numbers.

2 - The number of days before the race.

3.1 - The distance, in miles, of the 5K race.

5 - The number of people on the race committee.

6.2 - The distance, in miles, of the 10K race.

9 - The anniversary of this year's race.

12 - The number of aid stations along the marathon course.

13.1 - The distance, in miles, of the half marathon.

20 - The percent of entrants who list a state other than Colorado on their entry form.

26.2 - The distance, in miles, of the marathon, which starts in the Poudre Canyon and ends in Old Town.

73 - The percent of entrants who list a city other than Fort Collins on their entry form.

94 - The number of people who bought a charity spot, with 100% of the entry fee going to charities.



Runners get ready for the 2009 Colorado Marathon. Registrations for this year's run are already filled.

300 - The number of volunteers on race day.

500 - Amount, in dollars, a runner gets for setting a course record.

1,000 - Amount, in dollars, a runner gets for setting a state record.

1,127 - The net elevation decrease, in feet, from the race's start to finish.

4,000 - The number of runners expected in the marathon, half marathon, 10K, and 5K.



The Colorado Marathon was voted most scenic route in 2008.

4,981 - The elevation, in feet, at the end of the race.

6,108 - The elevation, in feet, at the start of the race.

23,500 - Amount, in dollars, raised

from charity spots that will go to numerous nonprofits, including high school cross country teams, the Harmony School, the Boys and Girls Club, and more.

"What I think is one of the most awesome things is the charity spots," race director Brian Cathcart said Thursday. "We sold out 94 of those in one week. Some races give the difference between a charity entry fee and a regular entry fee to charity; 100% of our charity fees go to charities."

350,000 to 400,000 - Amount, in dollars, that runners alone spend in the city, according to Tyler James, director of sales for the Fort Collins Convention and Visitors Bureau.

"The town is sold out," James said. "There are a few other things going on, but it's a very successful event, and we're lucky to have it in our area."

Cathcart said he expects both featured races, the marathon and half marathon, to be wide open. "We should have another good event," Cathcart said. "The weather looks like it's cooperating, too."

Said James: "The bottom line is that it's a great event."

# Classifieds

## MYSTERY SHOPPER/MER- CHANDISING POSITIONS AVAILABLE

Job type: Full-Time/Part-Time  
Pay: \$15.00 - \$20.00/hour  
Mystery Shoppers and Merchandis-  
ers Wanted Part-Time AND Full-  
Time. Here's your chance to get paid  
for shopping and dining out.  
Flexible schedule.

Contact Edie: 654-2396

## PATIENT CARE DIRECTOR - HOSPICE - RN - HOME HEALTH - REGISTERED NURSE

Job type: Full-Time  
Pay: \$60k - \$75k/year  
Patient Care Director - hospice - RN  
- home health - registered nurse -  
community health patient  
care director.

Contact Drew: 675-9845

## SHIFT MANAGER

Noodles & Company is looking for  
shiny, happy people who thrive in  
a fast-paced (but not fast food) en-  
vironment and appreciate balanced  
schedules, awesome hours, and lots  
of room to grow. But fear not—  
while we do want to be a part of your  
life, we don't want to consume it  
(hey, we have lives too!).

Job Type: Full-Time

Contact Murphy: 675-5632

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## CONTRACT CALL CENTER CUSTOMER SERVICE REPRESENTATIVE

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room for negotiation.

Requirements:

At least two years of call center  
customer service experience at one  
company is required.

High school diploma or equivalent is  
required.

Must be computer literate with the  
ability to learn customer service soft-  
ware applications.

Duties require professional verbal  
and written communication skills and  
the ability to type 30 wpm.

Contact Rodney: 555-3212

## E-LEARNING INSTRUCTIONAL DESIGNER

Managed Business Solutions is  
seeking an e-Learning Instructional  
Designer for a role with one of our  
partners in Northern Colorado (Ft.  
Collins). This is a possible contract-  
to-hire role. This position will help  
our partner to shape game-oriented  
e-learning platforms in a 3D environ-  
ment. Only local candidates will be  
considered; no third-party or agency  
candidates, please.

Contact Isla: 555-9854

## QUALITY ASSURANCE TESTER

Managed Business Solutions is seek-  
ing a Quality Assurance (QA) Tester  
to support our software initiatives in  
Ft. Collins, CO. This is a full-time/  
salaried opening with our program  
team at the National Parks Service.  
Only local candidates will be con-  
sidered; no third parties or agencies,  
please.

Contact Isla: 555-9854

## SANDWICH ARTISTS

Perform a variety of duties relating to  
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ing greeting and serving custom-  
ers, cold and hot food preparation,  
stocking counters and steam table,  
and maintaining sanitation standards.  
Responsible customer service is a  
major component of this position.

Contact James: 555-9565

# Classifieds

## Job Announcement: Diseases Technician (prairie dogs/black-footed ferrets)

Colorado Division of Wildlife, Wildlife Health Program

Position: **DNR CF86**

www.wildlife.state.co.us

317 W. Prospect Rd., Ft. Collins, CO 80526

**POSITION (TITLE):** Temporary Aide (Technician I: Disease – Prairie dogs/Black-footed ferrets; 1 position)

**PAY RATE:** \$13.50/hr.

**LOCATION/DUTY STATION:** The first two months (April – May) of this position will be stationed in Moffat County (NW Colorado); after this time we expect the position to be stationed in Fort Collins, with occasional travel required. The position is expected to last through September.

**JOB DESCRIPTION:** **Expected start date is 1 April 2011.** This position will aid in management of and surveillance for sylvatic plague in Colorado. The successful candidate will be required to live in a relatively isolated location in Moffat County for the first two months; rudimentary housing will be provided during this time (e.g., a trailer). The remaining tenure of the position will involve assisting Wildlife Health Program staff with routine disease surveillance, research, and associated activities and will be stationed in Fort Collins.

The first two months of this position will largely be dusting prairie dog burrows with Deltamethrin dust via a backpack dusting unit (i.e., on foot). This will complete an effort to actively control fleas (the known vector of plague) in black-tailed prairie dog burrows in the area with the largest population of endangered black-footed ferrets in Colorado. Dusting burrows will require occasional work in inclement weather and can be physically demanding and tedious. If time permits, additional opportunities for experience may be available (e.g., spotlighting for black-footed ferrets). Must be willing to be flexible with the work schedule, as field work may be dictated by weather, and be willing to occasionally work weekends. This position will also require collection and identification of fleas for plague surveillance and research, following scientific protocols.

**MINIMUM REQUIREMENTS:** Those with an interest in wildlife conservation, disease, and/or entomology are encouraged to apply. A B.S. degree in Wildlife Biology, Zoology, other natural resources field, or at least one year completed coursework toward a degree in the fields listed previously (i.e., actively pursuing degree) is desired.

- Must be willing to work in areas that may have had plague epizootics in the past, and must follow personal safety guidelines provided (plague is a zoonotic disease caused by the bacterium *Yersinia pestis* and is usually contracted from the bite of an infected flea).
- Must be able to hike with a backpack (<30 lbs.) for up to seven hours each day (expected April – May only).
- Must have a valid driver's license; experience driving 4WD vehicles in adverse driving conditions, operating an ATV, and use of a GPS is preferred but not required.
- Applicants must be detail-oriented, familiar with MS Word and Excel, willing to learn and use CDOW WHP standards for data collection and entry, and have good communication skills.
- Must be able to work independently or with others in somewhat remote areas, often with little direct supervision.

**HOW TO APPLY:** Please send a letter of interest, C.V. or resume, and contact information for three references via email with "Disease Management Position" in the subject line to [bpolder@wildlife.net](mailto:bpolder@wildlife.net).

**APPLICATION DEADLINE:** October 1, 2010. New technicians will be chosen from the training sessions in November or February.



### Notes about the Problem

*Directions: Use this space to list up to 10 facts that seem important to this problem. Also make note of questions that come to mind as you read, especially information that seems to be missing from this account that would help you understand the problem better.*

1. \_\_\_\_\_

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10. \_\_\_\_\_

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## Learning Issues Board

Hunches:

<b>What We Know</b>	<b>Learning Issues</b>	<b>Plan of Action</b>

***Reflective Moment: Encountering a Problem***

*Briefly respond to one of the questions below. Place an x by the question answered.*

\_\_\_\_\_ Why do you suppose the black-footed ferret is so important?

\_\_\_\_\_ What seem to be the most important elements of the problem at this point?

*A quality response: (1) addresses the question, (2) stays on topic, (3) is plausible or reasonable, and (4) gives enough detail to make your ideas clear.*

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## Sample Learning Issues Board

Hunches: Efforts to save the ferret have not been very successful, and we need to change our tactics. We might lose our funding. Maybe something is wrong with the ferret. It must be hard to reintroduce black-footed ferrets into a suitable habitat.

What We Know	Learning Issues	Plan of Action
<ul style="list-style-type: none"> <li>We are members of the Black-Footed Ferret Recovery Reintroduction Team.</li> <li>Progress on reintroduction of black-footed ferrets is not moving quickly enough.</li> <li>Some believe efforts are too expensive and too labor-intensive.</li> <li>The media is covering our efforts.</li> <li>We need to be proactive by anticipating problems and by creating a model of a feasible habitat suitable for ferrets and other inhabitants.</li> <li>Fort Collins, Colorado, is the test site.</li> <li>Black-footed ferrets are fragile.</li> <li>We need to take into account the “human climate.”</li> <li>We are required to present a feasible model to the Project Oversight Committee in about two weeks.</li> </ul>	<ul style="list-style-type: none"> <li><b>What is the Black-Footed Ferret Recovery Reintroduction Team (BFFRRT)?</b></li> <li>Why are we reintroducing ferrets?</li> <li>What is so special about the black-footed ferret?</li> <li><b>What is a genetic bottleneck?</b></li> <li>What did the media say?</li> <li>How much does it cost to reintroduce black-footed ferrets?</li> <li>Why were we brought together as a team?</li> <li>Could we just go somewhere else?</li> <li><b>What makes a suitable habitat for this kind of ferret?</b></li> <li><b>What challenges have occurred during past reintroduction efforts?</b></li> <li>What can we learn from less successful attempts?</li> <li>Do we need to change anything at the test site in order to be successful?</li> <li>Do we need to do anything to accommodate the fragility of black-footed ferrets?</li> <li><b>What does “human climate” mean?</b></li> <li>What makes a good model?</li> </ul>	<ul style="list-style-type: none"> <li>Research the goals and objectives of the BFFRRT.</li> <li>Research past ferret reintroduction efforts to see if there are things we can learn.</li> <li>Look at maps of the Fort Collins area.</li> <li>Read the newspaper article.</li> <li>Ask a biologist why the black-footed ferret is “fragile.”</li> <li>Find information about the black-footed ferret habitat.</li> </ul>

Bold items represent students’ top priorities for research.