



Bird vetch blankets a hillside. *Photo courtesy of Janice Chumley*

Alien Invaders

Can Alaska avoid the mistakes made elsewhere in the country?

By Kim Morris

Driving through parts of Mississippi, Alabama and Georgia is like moving through a Christo and Jeanne-Claude installation. But instead of the landscape being swathed in fabric, the fences, trees and abandon cars are covered in kudzu (*Pueraria lobata*). This Asian member of the pea family was introduced into the U.S. in 1876 and promoted as a forage crop. What started out as a promise of better animal feed is now a land management nightmare. Today kudzu spreads at a rate of about 150,000 acres annually, killing everything in its path, and infests anywhere from 2 million to 7 million acres. Large stretches of southeastern U.S. are carpeted in this green death. A similar scenario is beginning to play out thousands of miles away in Alaska.

The John Butrovich Building, the University of Alaska's statewide administration building, is located on the west ridge of the University of Alaska Fairbanks (UAF) campus. It has a commanding view of the Alaska Range and is one of the first Fairbanks buildings visible to

visitors who arrive by train. When the building was completed in 1995, the steep slope below it was bare. Within a few years, isolated bird vetch plants began colonizing the slope. Their purple flowers added color and their roots stabilized the slope. Bird vetch (*Vicia cracca*), a member of the pea family native to Europe and Asia, had established a foothold on the UAF campus. Fifteen years later, it blankets the entire slope and is invading the nearby experimental farm and forest. No wonder that some land managers call it the Alaska kudzu.

Most garden flowers, fruits, and vegetables we grow come from other ecosystems and climate zones. They flourish because we help them. Almost all of the plants that spread their seeds or runners beyond the field or garden die because they can't cope in the natural environment. Only 1 percent of these escapees thrive in areas beyond their natural range. These invasive plants are adaptable, aggressive and prolific. They threaten local agriculture, forestry, waterways, subsistence resources and tourism. The economic cost of these invaders, due to loss of natural habitat, reduction of productivity and the cost of combating them, exceeds \$120 billion annually in the United States. Invasive plants are a relatively new problem in Alaska and their footprint is small. The harsh climate, low soil temperatures and limited road and rail system protected the state from these aliens. But now new plants are showing up everywhere people go. Will the state make the same mistakes as the rest of the country or rise to the challenge and eliminate, or at least limit the spread of, these invaders?

Invasive plants are cunning infiltrators. The threat they pose is not immediately apparent. The casual observer might mistake them for wildflowers when the plants first arrive on the scene. But given time, they can overwhelm the local ecosystem, out competing native plants, displacing indigenous animals, even changing the soil's chemistry. Bird vetch crawls over and climbs up other plants, monopolizing light, water, and nutrients. It establishes itself in grassy areas and along roadsides but can invade undisturbed forest habitats. It survives fire, drought and cold winters. Its pea-like flowers are densely packed, some 15-40 flowers per cluster. Each flower produces a pod that contains 4-8 seeds. The seeds can be stored in the ground for five to seven years – these are called seed banks. This plant also alters soil conditions. It does this through a mutually beneficial relationship with a bacteria living in its roots. The bacteria take nitrogen from the air and make it available for plant nutrition, a process called nitrogen fixation. The nitrogen-based compounds that result from the nitrogen fixation are available only to the host plant.

Bird vetch was first cultivated on the U.S. government experimental station at Rampart in 1909 as a potential forage crop. Experiments continued at stations in Fairbanks and Palmer until the early 1970's. Eventually, bird vetch escaped from these fields and spread along the limited road and rail system, especially the Parks Highway from Anchorage to Fairbanks. This high traffic area has plenty of disturbed ground from construction and roadwork, providing both a way to get around and a place to grow. Though the highest concentrations of bird vetch are in the Fairbanks and the Matanuska-Susitna regions, other areas of South Central and Interior Alaska are affected as the secondary road system becomes more heavily used. The Alaska Exotic Plant Information Clearinghouse (AKEPIC),

a cooperative project among federal and state agencies and the University of Alaska, has developed a invasive ranking from 1 to 100 (100 is the worst case). AKEPIC describes bird vetch as highly invasive and gives it a ranking of 73. This invader is routinely named on “Alaska’s Most Wanted Invasive Species in Alaska” lists although, in this case, the plant isn’t really wanted at all.

Darcy Etcheverry is the Invasive Plant Coordinator at the Fairbanks Soil and Water Conservation District (FSWCD). She helps landowners prioritize invasive plant control efforts and get the most effective solution with available resources. The FSWCD supports an integrated approach to combating invasive plants that includes prevention, identification and rapid response and the limited use of herbicides. Sitting in her cramped office, she brings up a graph on her computer screen that shows the interplay between the increase in land coverage of an invasive plant over time and human response. It looks like a stylized S. In the first phase, called the proactive stage, the rate of spreading is slow. If the plant is recognized as invasive at this stage it can be easily dealt with. In the second stage (active phase), there is an exponential increase in the amount of land covered by the invasive plant. . Ideally, the plant is recognized for what it is early in this phase and action is taken. If this happens the plant can be contained or, better still, eliminated. Unfortunately, awareness of the problem usually occurs towards the end of this phase when the plant has spread and easy solutions won’t be effective. In the final phase (reactive stage), the plant reaches its maximum distribution. Now the solutions are costly and time-consuming. In some cases, herbicide may be the most practical option.

On Wednesday June 23, 2010 Marie Heidemann held the Bird Vetch Weed Pull as part of Invasive Weed Awareness Week, a nationwide event. Volunteers filled about a dozen large garbage bags with bird vetch that was overwhelming the native vegetation along the ski trails and the alpine hut on the west ridge of UAF. This sounds like a lot but as Heidmeann, a graduate student in the School of Natural Resources Management and Agricultural Sciences, said, “This didn’t make a real dent in the infestation. It only slowed it down.”

This event highlighted the growing invasive plant problem on UAF’s main campus. Starting with an existing invasive plant survey completed in Summer 2008 by UAF senior Jessica Guritz, Heidemann, spearheaded the formulation of the UAF Campus Invasive Plant Management Plan. It is no surprise that bird vetch was described in the plan as an established invader on campus. Unfortunately, bird vetch is difficult to eradicate once established. Hand pulling can be effective for small infestations, but this needs to be done several times a year for several years in order to make sure all the seed bed has been exhausted. Mowing is more cost-effective for large infestations but must also be done repeatedly. Spot spraying of herbicides is also effective. In the end, the plan concluded that containment could only be achieved by a combination of mowing and trimming to prevent seeds maturing, and by the limited use of herbicide. The problem is so larger that weed pulls are not an effective way to deal with the infestation. However, it is the only way to remove these plants from trees, fences and other structures. Heidemann and her 13-member task force recommended that weed pulls be used as an educational tool. Bird vetch containment “doesn’t have to be costly,” Heidemann said. “A lot can be done by

changing practices.”

Even a relatively pristine environment like Denali National Park and Preserve is not immune to invasion. “There are roughly thirty seven non-native plant species that occur in the park,” said Carl Roland, the park’s plant ecologist. Fortunately, infestations are confined to the immediate footprint of human development such as roadsides, building pads, and airstrips. While dandelions are the most visible and easily recognized weeds in the park, they are not the problem. “They are in the park to stay,” Roland said matter-of-factly. “There are actually several native species of dandelion in the park.” Bird vetch is the real threat to Denali. Like most visitors to the park, it arrives via the Parks Highway. Some precautions are taken to minimize the introduction of non-native plants by vehicles. Any kind of construction equipment is sprayed before it is allowed in the park. The buses that run tours in the park are washed every day. But the main source of invasive plant material is private cars and trucks. The vetch is controlled by primarily by pulling. Herbicide is used sparingly in the park. Volunteers, often student groups, pull weeds for a week and get to stay in the park for free. This means that the park’s costs for invasive plant management are relatively low – about \$20,000 a year.

Katie Spellman is a graduate student in the Resilience and Adaptation Program at UAF. She has organized five-to-six workshops a year for the last two years for teachers in areas of high infestation. Along with her mother, a teacher at Denali Elementary School, she developed a curriculum called Weed Wacker, which includes a lesson specifically aimed at bird vetch. “Students are a captive audience and a gateway into their families,” Spellman said. “The kids feel empowered because combating alien plants is something they can do.” They are also willing and enthusiastic recruits in the fight against these invaders.

Not all of Fairbanks’ locals consider bird vetch a problem. “Have I told you about the bee keepers?” asks Etcheverry, the invasive plant coordinator. “They think bird vetch is great.” The plant produces a lot of flowers. That allows bees to produce a lot of honey. This also explains why some members of the community are not enthusiastic about the FSWCD recommending the use of herbicides. They are concerned about the effects it will have on the bees as well as other plants. Etcheverry insists that using herbicides in a responsible way is part of an integrated approach. This stance is echoed by Michele Hebert, who, until recently worked for the Cooperative Extension Service (CSE) at UAF. “Most people don’t understand how specialized herbicides have become. Some common items in your kitchen, like vinegar, are more harmful to plants and insects,” she said. The CSE attempts to overcome some of these misunderstandings by offering a course in herbicides and pesticides for local gardeners.

Honey production sounds like a benefit. But, Etcheverry said, if the bees are busy pollinating the bird vetch, they might not be visiting the local native plants. This could undermine the reproductive success of these plants, allowing the bird vetch to further dominate the area. Little is known about this at the moment but in a few years’ time Spellman may have the answer. Her Ph.D. research is on the impact of invasive plant species on plant-insect interactions in Alaska. One of the things she is interested in is

whether or not invasive plants will steal pollinators from the native plants Alaskans depend on for food like wild berries.

Meanwhile, the fight to limit the spread of bird vetch continues. A couple of days after the Bird Vetch Weed Pull on the UAF campus, Etcheverry held the First Annual Weed Smackdown at Tanana Lakes Area in Fairbanks. Before the 88 participants were let loose on the park, they were given a copy of the 2010 Weed Smackdown Invasive Plant Field ID Guide, a “Just Say No to *Cracca*” temporary tattoo and some training. After all, bird vetch looks almost the same as milk vetch and alpine sweet vetch, which are both native Alaska plants. The weeders pulled more than 3400 pounds of invasive plants from about 27 acres. This event was a big success - Smackdown II is already in the planning stage.

Bird vetch has made inroads into Alaska but there is a dedicated corps of natural resource professionals and committed citizen volunteers committed to limiting its spread. “Our salvation is going to be early detection and rapid response”, Spellman said. If they are smart and lucky they will be successful and Alaska will never be a northern version of the kudzu wastelands of the southeastern U.S.