



HEROES NEEDED TO KEEP INVASIONS AT BAY IN RUMSEY

By Cheryl Bradley

On a beautiful summer day in 2006, I was with a group of friends and colleagues enjoying the largest block of plains rough fescue grassland in the world – the Rumsey Natural Area and Ecological Reserve. We happened upon a narrow pipeline disturbance recently seeded to a robust tufted grass with comb-like seed heads. There was a collective gasp, followed by shocked silence. It was crested wheatgrass!

Here in the heart of this designated protected area north of Drumheller, a gas company employee had cast crested wheatgrass seeds onto the narrow strip of bare ground that ran several hundred metres from a wellsite to a connecting pipeline. We were facing another formidable foe in the heart of an area we were working to protect and restore.

Among those interested in preserving rough fescue grasslands, there is fear and loathing at the thought of crested wheatgrass, smooth brome grass, and Kentucky bluegrass getting a foothold in natural areas. These introduced species reduce biodiversity and wildlife habitat, and compromise the aesthetics of our native prairie ecosystems. They raise the spectre of prolonged battles of human energy and ingenuity against the powerful life force embodied in the seeds and spreading roots (rhizomes) of these invasive agronomic species.

Since agronomic species are chosen by landowners to plant for livestock forage, soil stabilization, or turf, our provincial weed law does not require their control. The effort to control or eradicate them in native grasslands must first be mobilized in government offices and industry boardrooms, and around the kitchen tables of landowners and leaseholders.

Southern Alberta's moist, loamy soils are similar to those in Europe and Asia, where crested wheatgrass (*Agropyron cristatum*), smooth brome (*Bromus inermis*), and Kentucky bluegrass



Spring 2008 – bright green tufts of crested wheatgrass are growing through vegetation killed with herbicide along a recently constructed pipeline in the Rumsey Natural Area.

PHOTO: C. BRADLEY

(*Poa pratensis*) originated. There are native elements of smooth brome and possibly Kentucky bluegrass in North America, which have interbred with their introduced cousins, but they did not occupy near the range of habitats that the introduced species do. Although one would expect native species to be better adapted than non-natives to their environment of origin, our native grasses tend to lose out in the fierce competition for resources with these species, which have the advantage of being unconstrained by the factors controlling their growth in their original habitats. The spreading roots of smooth brome and Kentucky bluegrass rapidly creep into small unoccupied spaces, seizing resources from native bunchgrasses such as rough fescue. The abundant seeds produced by crested wheatgrass germinate early in the spring, and the

vigorous seedlings get a head start on native grasses in the race for unoccupied space. Once they have occupied a site, the invaders do not give it up.

In drier mixedgrass prairie, smooth brome and Kentucky bluegrass are confined to moist draws, valleys, and wetlands. Crested wheatgrass, a native of the dry steppes of Siberia, survives under a broader range of climatic and site conditions, including upland sites of mixedgrass prairie. In the moister climate of central Alberta and the foothills where rough fescue grasslands occur, all three invasive grasses can persist and spread into all but the driest upland sites. They have the capacity to overwhelm native grasslands and dominate the modified plant community for many decades. An official acknowledgement that these modified communities will persist for the foreseeable future on a large proportion

of southern Alberta's rangelands occurred just a few years ago when government-issued foothills range guides were revised to recognize plant communities dominated by Kentucky bluegrass.

The plains rough fescue (*Festuca hallii*) grassland communities of central Alberta are at risk of extinction, and non-native species invasion is the biggest threat. A 2003 study found that more than one-third of grassland sites remaining in the Central Parkland Natural Subregion were predominantly non-native. Only one in ten sites had plains rough fescue communities, and about half of these had invasive agronomic species. The Northern Fescue Natural Subregion has experienced a similar loss of native grassland. Less than one-quarter of that subregion supports native vegetation, and only about 5 percent persists as plains rough fescue grassland. The native grasslands that remain are experiencing invasion of non-native species from roads, trails, fields, livestock use, and industrial and residential developments.

Managing sizable (>10 km²) natural areas to prevent and arrest invasion of non-native species is our best hope for preserving rough fescue grasslands. On a recent visit to the second-largest protected area in the Northern Fescue Subregion, the Hand Hills Ecological Reserve (22 km²), I was dismayed at the rapid spread of smooth brome into the undulating rough fescue grasslands. Brome's bright green sod occupies draws and depressions, and is fingering its way upward into more of the soft green rough fescue bunchgrass community. Attempts to reduce the cover and competitiveness of agronomic grasses in rough fescue grasslands using fire, mowing, herbicides, and livestock grazing have so far met with poor results.

The Rumsey Natural Area and Ecological Reserve (183.5 km²), which straddles the Central Parkland and Northern Fescue Subregions, offers our biggest and best opportunity to check the advance of invasive agronomics into plains rough fescue communities. The extent of invasive species in the protected area has yet to be fully documented. Ensuring that native vegetation remains in good condition is the most effective way to prevent invasion of Kentucky bluegrass, smooth brome, and crested wheatgrass. Where these species already occur, control measures tailored to the



A patch of smooth brome (outlined) has invaded plains rough fescue grassland from a nearby wellsite in the Rumsey Natural Area. PHOTO: C. BRADLEY

species and the site are needed.

Kentucky bluegrass has taken hold in some parts of Rumsey, particularly sites that were disturbed. Management to avoid industrial disturbances and overgrazing could prevent further spread. It is unlikely that Kentucky bluegrass will be eliminated from the sites it currently occupies. With proper management, however, co-dominance of rough fescue and Kentucky bluegrass will likely occur. Rough fescue will have a competitive advantage on drier sites in dry years, and Kentucky bluegrass on moister sites and in wet years.

Smooth brome has occupied some draws, wetlands, and industrial disturbances on moist sites in the protected area. Its spread may be checked by control efforts such as shading, herbicide wiping, and early-season mowing or grazing targeted specifically at the occupied sites. Repeated treatment over several years will be required. Follow-up seeding with desirable species may help prevent its regrowth. New disturbances need to be avoided.

Crested wheatgrass has been seeded and is invading at only a few industrial sites. Targeted application of herbicide through wiping early in the spring, prior to seed formation, is likely the most effective control measure. This will need to be done several years in a row to exhaust the seed bank. Native seeds will need to be planted to fill the gaps. A key measure is to ensure that no more crested wheatgrass seed is introduced.

Working against attempts to preserve plains rough fescue grasslands and

control invasive agronomics in the Rumsey Natural Area and Ecological Reserve are those who wish to undertake new gas development, thereby increasing disturbance and risk of invasion. There also are issues around ill-defined range management. Fortunately, a reclamation advisory committee is working to address some of the issues, but ongoing approvals for pipeline and well construction confound their efforts.

On another beautiful day this past spring, I again visited the site in the heart of the Rumsey protected area where crested wheatgrass seed had been scattered along the narrow pipeline right-of-way a few years earlier. I found patches of dead vegetation where herbicide had been applied the previous year. At least someone was trying to address the problem. Green tufts of crested wheatgrass, however, were growing in these patches and had advanced several metres up a hillside. Seed was already being produced. I reflected on the powerful life force of invasive agronomics and the powerful human forces, including greed for the profits of non-renewable energy production, that are leading to death-by-a-thousand-cuts of our native rough fescue grasslands. These are formidable forces. It will take heroic efforts to overcome them. 🍌

Cheryl Bradley is a professional botanist living in Lethbridge. She has worked in prairie environments for three decades. She currently serves as southern director for the Alberta Native Plant Council.