



UNIVERSITY OF ALBERTA

RANGELAND RESEARCH INSTITUTE (RRI)

**2013-2024
Strategic Plan**

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1. Introduction

In 2010 the Faculty of Agricultural, Life & Environmental Sciences (ALES), University of Alberta, acquired a 12,300 acre ranch through a generous donation from Edwin and Ruth Mattheis. This gift, combined with the greatly expanded land base available at the Kinsella Research Ranch, provides the University of Alberta and scientists across Canada with greatly enhanced research and teaching opportunities in rangeland ecology and management. In recognition of the historic gift, the University agreed to establish a Rangeland Research Institute (RRI) as well as fund the Mattheis Chair in Rangeland Ecology and Management. Research and teaching activities taking place on the Mattheis Ranch will be the immediate priority but the RRI will take advantage of complementary research facilities at other locations, including the fore-mentioned Kinsella facility.

Rangelands are found across Western Canada, including 43% of the agricultural land base of Alberta, and encompass native and introduced grasslands on both public and private lands. These grasslands are of great importance from both a socio-economic and environmental perspective. In addition to supporting livestock production through the provision of forage, rangelands are a key reservoir of biodiversity and play an important role in fulfilling basic ecological functions, for example by maintaining wildlife habitat, conserving soils and sequestering carbon, as well as providing clean water, among others. Despite their widespread geographic size, rangelands and the ecosystem services they provide, particularly those in the prairie and parkland regions, are among the most threatened in Canada as land uses such as intensive agriculture, energy exploration, recreation and urban sprawl continue to expand. The conservation and sustainable use of remaining rangelands depends on the gathering of relevant and timely information regarding their biology/ecology, socio-

The vision of the RRI is to demonstrate leadership in conducting innovative research and teaching on a wide variety of issues pertinent to rangeland ecology and management, including:

- *Grassland ecology;*
- *Wildlife management;*
- *Grazing systems and cow/calf management;*
- *The provision of environmental goods and services;*
- *The impact of climate change on mixed-grass prairie;*
- *The establishment, production, harvesting and storage of forages;*
- *Land reclamation; and,*
- *Water resources management.*

economic functions and fundamental response to management systems. Gathering this critical information is the primary mandate of the RRI.

2. Resources Supporting Core Research

Since rangeland ecosystems tend to be relatively well adapted to chronic disturbance and environmental stress, as exemplified by frequent and severe droughts in recent times, long-term studies are critical for a comprehensive assessment of ecological processes and the development of scientifically-based best management practices. Long-term studies and treatment applications dramatically increase the scientific scope of environmental research and are invaluable for the advancement of ecological and land management science. It is primarily through long-term studies that we will fully realize the scientific legacy of the U of A Rangeland Research Institute in addressing questions of key interest to rangeland scientists, private and public land administrators and policy makers.

The recent acquisition of the Mattheis Ranch near Brooks, Alberta, follows a number of developments over the last few years that have given the University and Faculty of ALES long-term and secure access to a diversity of agricultural lands, providing an unprecedented opportunity to establish long-term research programs focused on the pressing environmental and economic issues pertinent to these regions. These include doubling of the size of the Kinsella Research Ranch (150 km southeast of Edmonton) in 2008 with the purchase of the adjacent Cathton Ranch through the assistance of the provincial government, and the donation of the St. Albert Research Station (777 acres) by the Boccock family in 2009. Collectively, these facilities provide a significant land base (a ‘living laboratory’ so to speak) on which to conduct a wide variety of basic and applied research. However, the ability to conduct research is determined by more than land. In the absence of research operational funding, which remains heavily dependent on the priorities and allocation of outside funding agencies, significant tracts of research lands can remain under-used, in essence leaving rangeland scientists “land rich but resource poor”. In order to overcome this problem, a strategy is needed to secure long-term access to research operating resources, similar to that available to AAFC researchers from ‘A-base funding’.

a. Fiscal Planning & the Rangeland Ecology and Management Research Endowment

We envision the creation of a research endowment in Rangeland Ecology and Management that serves several purposes, including providing 1) core funding for important projects that would otherwise not be supported (i.e. projects that fall between priorities of other programs), 2) bridge funding for long-term studies during periods when other sources of core funding may not be available, 3) funding for routine operations of the RRI needed to support ongoing rangeland research activities (e.g. maintenance of spatial and related datasets, communications, internationalization, etc.) and 4) promoting long-term conservation of rangelands managed by the University. This endowment would function not unlike the Breton Endowment, which provides the fundamental resources needed to maintain and sustain long-term plots involving state-of-the-art agronomics in Gray Luvisolic soils.

Two primary means will be used to develop the endowment. The first is fundraising from private individuals and other stakeholders, including industry and non-government organizations. This process is well underway, as discussions have been initiated with several interested individuals and strategic stakeholders. The second is contributions from utility and surface lease revenue at the Mattheis Research Ranch. Our objective is to grow this endowment to approximately \$8M over the next 10 years. This time frame coincides with the period when oil and gas revenue on the Mattheis Ranch is expected to be relatively stable. However, potentially declining surface revenues after 2025 based on the current life expectancy of gas wells on the Mattheis Ranch may reduce the funding available for developing the endowment after that time. Consequently, there is considerable urgency in developing this endowment over the next 10 years.

Complicating the process of building the Rangeland Research Endowment, is the need to pay-off the balance of an internal loan (approximately \$2.2M) that covered costs associated with acquiring the Mattheis Research Ranch. This liability will hinder development of the endowment over the next 10 years. Moreover, if projections of surface lease revenues decline, growth of the endowment could end prior to the RRI meeting its goal. Further, the RRI will continue to use a portion of its revenues to fund research through a Competitive Grants Program as well as the administrative costs of the Rangeland Research Institute. The amount allocated to research versus the endowment will be evaluated on a year-to-year basis, and will depend on the quality

of research proposals received, and the strategic value of these to the RRI. Continuing to fund high quality research is critical to building institutional capacity, and establishing the RRI as a prominent and credible research institute. Consequently, developing the endowment from multiple sources must be a priority for the University of Alberta and the RRI.

Finally, we will explore opportunities for private stakeholders and industry groups to strategically fund research that is of interest to them, but is not typically supported through conventional research programs (e.g. research targeting alternative revenue models as environmental goods and services from rangelands). These contributions will be used as ‘seed money’, which is necessary to leverage additional support from programs such as Growing Forward II (25% industry funding required), NSERC Collaborative Research and Development (50% industry) or consortium funding (e.g. ACIDF, ALMA: 50% industry)

b. Building Scientific Capacity in Rangeland Research through Industry Involvement

In order to become a world recognized center for excellence in rangeland research, our capacity for conducting science will need to increase. This is further emphasized by the low number of range scientists across Canada in general, a cohort that has been declining in many institutions over the last few years due to retirements and lack of rehires. In order to maintain, and build on, the momentum gained by the acquisition of the Mattheis Research Ranch, further research capacity in rangeland ecology and management, and related disciplines, is needed. Moreover, growth in research capacity would be consistent with that required to meet the growing demand for relevant research on sustainable rangeland management and conservation across western Canada.

Opportunities to increase this capacity are unlikely to be filled internally through the U of Alberta, particularly with the current fiscal climate in the province. Instead, positions are more likely to be developed in the short-term through Endowed Professorships or Research Chairs, which in turn, are derived from industry funds, typically leveraged with other opportunities such as NSERC. Key themes that are well suited for potential chair positions associated with the RRI could include 1) quantification of environmental goods and services from rangelands, 2) reclamation and rehabilitation of disturbed prairie agro-ecosystems, 3) rangeland hydrology and function, and 4) cow/calf beef production efficiency from rangelands. The establishment of 2

professorships and/or chairs over the next 10 years would represent a significant increase to intellectual expertise and research capacity across Alberta and Western Canada. Additionally, while some extension can be carried out by existing U of Alberta faculty and RRI staff, having a dedicated extension scientist affiliated with the RRI would significantly increase the institute's capacity to meet its objectives related to teaching and technology transfer. The RRI will pursue opportunities to establish such a position, for example by leveraging industry funds to create a new faculty position or co-locating a government scientist (e.g., a forage/range specialist from Alberta Agriculture) within the Faculty of ALES.

3. Communications

A key factor regulating success of the RRI and its ability to promote relevant research and teaching regarding rangelands and their sustainable management will be in promoting and utilizing more effective communication. Conducting research in isolation, and outside the context of sustainable rangeland management systems, is less likely to attract industry support, particularly if it does not translate into deliverables for producers and land managers. Thus, a communication strategy will be developed for the RRI over the next 2 years that strives to 1) highlight the key role and opportunities created by the RRI, in conducting innovative research on rangelands, developing highly qualified personnel, and meeting socio-economic needs, 2) regularly bring the (limited number of) range scientists together from across Western Canada and beyond to share ideas and establish joint research projects, 3) regularly and efficiently translate cutting edge range research into useful information and products for producers and other practitioners, and 4) effectively reach out to all stakeholders with an interest in rangelands, including scientists, students, producers, industry, land administrators, and NGOs, using a variety of mediums (website, written material, conference and other presentations, etc.).

a. RRI Communications to Aid Technology Transfer

There is a rich history of rangeland research in Western Canada, and in particular in Alberta. However, research is only as effective in altering land management on private and public land, as the associated efforts to translate this information into working management practices or policy. Significant opportunities for technology transfer in Alberta have largely been through the Western Canadian Grazing Conference, which is held every other year in Alberta,

and at one time, the Western Range Science Seminar, held several times in the early 2000's. Other major opportunities arise as well such as the Prairie Endangered Species Conference. In the future, the RRI will have to establish an identifiable presence at these events. This could take a number of forms, such as having a booth presence and informational material available for the public, and where possible, organizing and hosting thematic sessions at major conferences. Ideally, should the need and opportunity arise, the RRI may also take the lead in directly sponsoring major seminars, potentially through the resurrection of the Western Range Science Seminar, to facilitate information dissemination, particularly to that audience not reached in other conferences. However, this will require significant resources to undertake.

Additionally, the RRI will continue to work closely with agencies having an interest in rangeland management across the province to promote extension activity. For example, the RRI Director and his graduate students have participated frequently in delivering 'lunch and learn' sessions for Alberta Environment and Sustainable Resource Development (AESRD) staff. These are web-cast interactive sessions accessible to AESRD staff across the province. Similar opportunities may exist to deliver these types of sessions with other groups, including member associations of the Agricultural Research Extension Council of Alberta, to promote technology transfer to various districts, including local counties and municipalities. Future activities of the RRI should build on, rather than compete with or duplicate, existing technology transfer activities, such as those associated with ForageBeef.ca, etc. Finally, the RRI will cultivate relationships with government and non-government agencies that form a network through which research results can be passed, and ultimately inform policy. As the institute's body of research and associated implications for policy reform increases, the RRI will identify agencies or individuals that will formally partner with the RRI to package findings in such a way that these will have the greatest impact.

b. Promoting Internationalization

An important aspect of the RRI is to foster the exchange of ideas and expertise at the international level. However, these types of collaborative efforts often require resources to undertake, particularly for new projects that may not have resources available to them to foster this level of interaction. Consequently, a mechanism is needed to promote international collaboration and travel by graduate students, scientists, and other personnel. In order to achieve

this, the RRI will work towards providing a reasonable amount of annual funding in support of international travel awards (e.g. \$5,000 annually). Ideally this amount would grow (perhaps through external sponsorship) and eventually allow for significant two-way travel of researchers between Canada and other collaborating administrations in other countries. Guidelines will be established to identify who can apply, acceptable use of funds, and other conditions of the award.

4. Enhancing Highly Qualified Personnel

Many science and natural resource courses at the University of Alberta have field trips designed to provide high-quality hands-on experiential learning in natural resources and sustainable management. The RRI has and will continue to provide significant opportunities for undergraduates to study the ecology and management of rangelands including: basic and applied ecology, grazing management, habitat and wildlife conservation, prairie reclamation and restoration, irrigation management, prairie hydrology (natural and augmented), and groundwater monitoring, among others. In addition to facilitating the training of undergraduates, facilities of the RRI will also contribute to graduate training, as well as serve in technology transfer to producers, administrators and land managers.

Both the Mattheis and Kinsella Research Ranches, coupled with complementary facilities held by AAFC at Stavely and Onefour, hold significant potential for use in coordinated resource experiments (i.e. experiments using the same protocol at all locations). These activities, in turn, would allow for widespread educational opportunities through experiential learning (class field trips), graduate research activities, producer demonstrations, and tours for other organizations. As these locations are at least 200 km from one another, each has significant potential to serve as a practical outdoor laboratory for a large region of the province. In doing so, the Mattheis and Kinsella Ranches could serve as model ranches that can be the foci of knowledge transfer programs for farmers and ranchers, non-governmental organizations and industry, as well as regulators, land administrators and policy makers.

A significant challenge exists in ensuring that the research and teaching facilities of the University of Alberta and RRI be utilized as effectively as possible for undergraduate education. This is particularly important given the growing need to incorporate experiential learning into undergraduate education. As a significant constraint that limits the use of facilities like the

Mattheis Research Ranch for teaching is the costs associated with travel, programs will be explored to acquire the resources in support of undergraduate teaching, potentially through industry sponsorship. In addition, improved alignment needs to occur with respect to the training of undergraduates at various academic institutions across the province, with specific reference to rangeland ecology and management. This includes strengthening formal ties between colleges and universities across the province, with the goal of increasing the quality of curricula and experiential learning for students throughout their programs. These types of linkages are also consistent with the province's interest in promoting Campus Alberta.

Despite the large number of biophysical opportunities for graduate training at the Mattheis and Kinsella Research Ranches, resourcing can be challenging to support a large number of graduate students, particularly for research topics that may not fall directly within the interest and/or priority of conventional funding agencies. Thus, opportunities will be pursued to increase opportunities for graduate student training on rangelands. One option here is to develop an NSERC CREATE application to establish a major significant research thrust in the area of Environmental Goods and Services from rangelands. A successful CREATE application would provide a significant infusion of resources to directly support graduate student training, as well as international travel opportunities, and in the process, also reduce the need for funding commitments from oil & gas revenues, which ultimately must be used to build the RRI Endowment.

5. Linkage to the ALES and University of Alberta Strategic Plan

Activities of the RRI, including components of this strategic plan, will be carried out in close alignment with other initiatives through the University of Alberta, including the Alberta Land Institute, the Land Reclamation International Graduate School, the University of Alberta Water Initiative, etc., and will be consistent with the U of A and Faculty of ALES Strategic Plans. In addition, activities associated with the RRI and this plan will take into consideration the needs of Campus Alberta, and incorporate strengths of other institutions, both for teaching and the development of highly qualified personnel, as well as collaborating on common research interests and capacity.