

ALL HANDS AND BREAKOUT SESSION PROSPECTUS(S) AND ABSTRACTS

Date: March 8, 2016

ALL HANDS SESSION

Leader: Scott Carleton (AUL NM Unit)

Title: Improving the Ability of New Unit Scientists to Transition from Startup to Full Competency into the University and Federal Landscape

Background: Since FY2010, approximately 30 new Assistant Unit Leaders (AULs) and Unit Leaders (ULs) have been hired into the Unit program presently accounting for a significant percentage (30%) of the program's staff. New-to-CRU AUL/ULs come from diverse backgrounds: newer professionals directly from the post-doc ranks, entry level and early career academics, state staff, and USGS. New AUL/ULs in face a series of challenges when starting their new positions. Because they essentially wear two hats at their new jobs, they have to face the challenges of both transitioning into a faculty position and for most, they need to deal with meeting responsibilities as a federal employee. So, there are multiple hurdles to gaining competence in their jobs and developing research programs, funding research, hiring students, teaching courses, navigating the political world of academia, and understanding the multitude of federal requirements. Making matters even more difficult, is that Units across the United States often function differently in terms of Unit management, funding allocations, and relationships with university, state, and federal cooperators. Because of this, it can be difficult to obtain applicable advice from peers within the Unit system. This session will evaluate feedback garnered from a survey of new-to-CRU AUL/ULs to identify current gaps in key areas in professional development and opportunities for improvement in program practices regarding the transition to full competency. The goal is to begin the conversation to identify best practices and or ways to improve guidance and preparation for new-to-CRU AUL/ULs to deal with diverse cooperator demands, understand fully promotional requirements (strategic RGE) and pathways, opportunities for professional development and learning within the CRU program, and thoughts on future leadership investment.

Goal: The goal is to understand how to better prepare new AULs and ULs for the academic and federal landscape. Specifically, provide better guidance on developing research programs, teaching, advising, in addition to Federal requirements.

Format: Large group discussion and feedback from seasoned and shiny ULs and AULs

Date: March 8, 2016

BREAKOUT SESSION 1

Leader: Tom Edwards (AUL UT Unit)

Title: An Increasing Role for Landscape Perspectives in the Management and Conservation of National and International Resources

Landscape represents patchworks of biotic and abiotic elements interacting among themselves over space and time. Depending on philosophical source, these patchworks and their patterns derive principally from interactions among "natural" (ie *sans* humans) processes or are largely a consequence of humans, who are considered a dominant force of landscape change.

No matter the philosophical perspective, central to all landscape questions is the concept of scale, expressed in terms of extent and resolution of ecological elements and the patterns created through their interactions. To some, the basic scale should be interpreted at "human" scale; that is, in kilometric extents and resolution. Others argue that scale is system centric, and that exploration of landscape patterns and processes should closely mirror those of the system being studied, be it meters for some species or thousands of kilometers for others.

From an applied perspective, landscapes are not only an organizing schema for examining natural processes, but also for managing the impacts of human-induced land use change and its cascading effects into ecological systems. Landscape perspectives are also important from legal and policy to federal land management agencies (eg USDA Forest Service Planning Rule 36 CFR 291, DOI Landscape Conservation Cooperatives). Some basic – although by no means all – goals of landscape ecology relevant to our roles as scientists include: (i) Improve understanding of the structure, function, and processes of landscapes; (ii) Advance understanding of how drivers and stressors influence changes in landscapes; (iii) Improve understanding of services that landscapes provide to society; and (iv) Apply science to inform decision making for management, conservation, and restoration of landscapes. The (iii) is increasingly being viewed as a separate, stand-alone theme of landscape ecology often titled ecosystem services.

Relevant and high visibility issues requiring landscape perspectives include species like the greater sage-grouse, fire management, water quality and quantity, and conservation and management of migratory and nomadic species that cross multiple land tenure boundaries, both within and across nations. Cutting across all these high visibility issues are human-driven disturbance and land-use change patterns, which are operating at both short- and long-duration temporal scales.

The purpose of this breakout session is to initiate discussion on landscape ecology and associated perspectives as related to CRU's research, education, and collaboration roles. To some, these perspectives can be conveniently labeled as transboundary concerns, where the ecological elements of interest do cross boundaries. Others include the roles of disturbance, be it pine beetle outbreaks that alter fire regimes and consequently modify habitat on which many species depend or landscape modifications affecting habitat integrity or water quality and quantity and aquatic organisms. In particular, the importance of a landscape perspective in meeting the conservation and management needs of our collaborators should be explored.

Some Questions to Initiate Discussion:

How can we improve the quality of landscape-scale data that stretches across multiple land-tenure or land-organization boundaries?

EX: *spp-specific geospatial data based on land-tenure derived definitions (eg mule deer habitat designations between CO and UT affecting transboundary studies)*

EX: *competing landscape organizational boundaries (eg TNC vs. Omernik-Bailey delineations of the Colorado Plateau)*

EX: *mismatched process-based delineations for organizing (stratifying) analytical units (eg HUC watersheds vs. habitat types)*

How can we incorporate transmission of landscape principles (eg connectivity, percolation / movement through fragmented habitats) and analytical outcomes to the students we teach, and the biologists and decision-makers with whom we interact? How are landscape analyses used?

EX: *landscape analyses can be complex; how do we transit research results to decision-makers? (eg large-extent species distribution models often at resolutions having limited applicability to localized management units)*

EX: *should issues like migration be viewed operationally, such as "transboundary" movement, or theoretically such as "percolation?" (eg historic migratory paths for many animals increasingly constrained due to, ie, urbanization, roads, energy development)*

How can we incorporate the "human" element, which both requires and demands access to landscape-scale resources?

EX: *many studies search for so-called "natural" (ie sans humans) systems for comparative purposes; is "natural" even real or relevant? (eg labeling of "reference" watersheds for flow rates, ecological indicators like invertebrates)*

EX: demographic shifts in US population make-up are inextricably altering use of landscapes for recreation purposes (eg some sociological studies indicate travel from home to "wildland playground" is principally a family activity of Caucasians; Hispanics tend to travel <20 miles for family activities and predominantly use urban and peri-urban facilities)

What limitations do we face in modelling processes and patterns at landscape-scales?

EX: linking local processes and patterns to landscape-scales still unresolved (eg. how reliable are point-generated process studies when translated to landscapes?)

EX: extracting legacy effects from current-day processes and patterns (eg. pinon-juniper woodlands "encroachment" vs. re-establishment after human alterations)

EX: so-called "state-transition" models – are they real, or do systems simply undergo repeated threshold tipping points (eg. how resilient are systems?)

Should landscape-scale research emphasize short- (eg decadal or less) or long-term (eg multiple decades, centurial) change elements? If both, how are they linked in a modelling environment?

EX: long-term climate change is indisputable; however, short-term land-use and ecological change(s) can over-whelm climate change signal (eg short-term successional change altering high-elevation meadow far outweighs management / conservation concern of climate change?)

EX: linking temporal scales of ecological process to societal scales problematic (eg policy / decision time scales rarely, if ever, follow the time scales of management endeavors, be it population management or habitat alterations; how do we counsel "patience?")

Date: March 8, 2016

BREAKOUT SESSION 2

Leaders: Matt Kauffman (UL WY Unit), Ted Simons (AUL NC Unit), Joe Zydlewski (AUL, ME Unit)

Title: Technology and science communication

Background: Developments in digital information technologies are rapidly changing fisheries and wildlife research. In this session we will explore the ways social media, citizen science, sophisticated tools to model and visualize data, and new publication models are changing the way we collect, share, and communicate our research.

Social Media. Because much of the public loves the outdoors, loves wildlife, or loves to hunt and fish, they are inherently interested in the work that we do. But they are generally not interested in science, and many - especially in rural areas - have a mistrust of science and scientists. The popularity of social media has created the opportunity to share fish and wildlife research with the public in rapid compelling ways. This section will explore the various social media tools that researchers are employing to share their work with the public. It will describe some of the unique technical challenges associated with these approaches. Sharing fish and wildlife research over social media is certainly not a panacea. The final portion of this section will explore some of the pros and cons of using social media to communicate science to the public.

Modelling and visualization. Integration of science into management decisions is central to our roles in the CRU. While publications are critical for conveying technical information, this medium can fall short in conveying a clear and cogent message to many stakeholders. The growing inclusion of complex data sets often results in our reliance on spatially extensive data and complex analysis. This can further hinder technical explanation. Innovative means of visual presentation can provide a common and interactive platform for managers and researchers. We will consider several examples where complex data were communicated to stakeholders with varied success.

New Publication Models. Digital information technologies are providing new tools to store and share data that are accelerating and expanding the scientific publication process. These include data repositories, open source software, and open access journals. This capacity is stimulating new models of peer review, and new publication standards aimed at greater transparency and the capacity to validate and replicate research in ways that were previously impossible. We'll discuss the challenges and opportunities of new publication models and their implications for Unit Program scientists, students, and cooperators.

Date: March 9, 2016

ALL HANDS SESSION

Leader: Jonathan Mawdsley (AFWA)

Title: **Science needs and science opportunities for state fish and wildlife agencies**

State fish and wildlife agencies in the United States occupy a unique niche as custodians of much of the country's fish, wildlife, and plant biological diversity. These agencies are committed to science-based resource management but often depend on external partners

for scientific information and analysis. Recent surveys conducted by the Association of Fish and Wildlife Agencies illustrate how scientific information is obtained and integrated into management decision-making at these agencies. This presentation will provide information about current scientific needs identified by state wildlife agency directors and managers, and provide examples of science-management partnerships at state and regional scales that are viewed as effective by state wildlife agency directors.

Date: March 9, 2016

BREAKOUT SESSION 1

Leader: John Organ (CRU HQ)

Title: **Science-Policy Interface Panel**

The science-policy interface panel breakout will provide the opportunity for further discussion regarding presentations on March 9 by Larry Voyles, Jonathan Mawdsley, and James Cummins and John Organ on March 8. Collectively these presentations will have set the stage for a rich follow up discussion on the importance of science to natural resource management and policy decisions, CRUs vital role in that interface, challenges to delivering science, and potential novel future solutions to make more effective, CRUs role and relevance to the program's management partners.

Date: March 9, 2016

BREAKOUT SESSION 2

Leaders: Barry Grand (UL AL Unit), Colleen Caldwell (UL NM Unit), Cecil Jennings (UL GA Unit)

Title: **Using technical assistance to maintain and strengthen science partnerships**

Background: Technical assistance is one of the three missions of the Cooperative Research Unit program, and it can be an important means of building productive partnerships between Units and state cooperators. For the purposes of this discussion, technical assistance is defined as the transfer of information outside of funded research projects, traditional university courses, and graduate education. It includes briefings, presentations, and participation at meetings,

continuing education for professionals and conducting analyses and projects that do not require additional funding. Realizing that every Unit and state agency is different, we asked the Association of Fish and Wildlife Agencies to poll Unit scientists, supervisors, and state cooperators to determine 1) determine the type of technical assistance Units are providing and why, 2) determine which type of technical assistance state agencies find effective and why, 3) examine the past and potential effects of technical assistance on science partnerships with state cooperators.

Goal: The results and ensuing discussion will be used to develop recommendations for use of technical assistance to maintain or strengthen partnerships with state cooperators.

Format: During this breakout, the results of the surveys will be presented followed by a moderated discussion. The intent is to prepare a white-paper for use by Units and cooperating agencies.

Date: March 9, 2016

ALL HANDS SESSION

Leader: Carl Schreck (UL OR Fisheries Unit)

Title: **The future ain't what it used to be: How to succeed with the science of the future**

Learn from my mistakes, both in administration and science. Regarding administration, aim to create problem solvers by surrounding yourself with the best and brightest. For this, trust your brain not your heart, and solve problems immediately. Encourage a broad education and being well-rounded. Recognize that you can't train common sense. Our work is fraught with ethical dilemmas. Regarding science, what we will do in the future is "cargo cult science", big data generation capacity and big data analysis capability. We still need (1) knowledge of baseline environmental conditions, (2) to look at problems at multiple scales (micro to macro and including all members of communities), (3) to consider small effects as well as the big ones, (4) to understand variation in whatever we are studying and not concentrate on the means, (5) to make sure we are not hampered by missing the obvious because we are operating with the wrong model, and (6) to form more unique, non-conventional collaborations. A broad, simple approach to complex problems is best. Keep cooperators happy, easily done by keeping them involved. The best science changes paradigms, but most of the science we will do will be driven by special interest groups with their own agendas, not by what we think is important. The

nature of the special interest groups will shift over time as the demographics of our country changes. Don't get bogged down worrying about strange things (I'll provide examples) that will come up. Most importantly, have fun.

Date: March 10, 2016

BREAKOUT SESSION 1

Leaders: Kevin Pope (AUL NE Unit), Pat Mazik (UL WV Unit), Terri Donovan (AUL VT Unit)

Title: **Effective and creative education solutions for the future**

Background: Cooperative Research Units are designed to enhance or supplement existing Fisheries and Wildlife Sciences programs at their respective universities. One core of our mission is graduate education, but some Units do not have the number of classes or expertise that might be needed. Sharing of expertise and classes across Units will not only enhance our mission, but allow graduate students to take classes that may not be available to them at their home Unit. The FWS National Conservation Training Center (NCTC) is interested in partnering with CRU to develop online classes and administrate them. Advantages would be that these classes would be open to students across the Units.

Questions:

1. What sort of courses are Unit priorities?
2. Can the Unit provide courses to meet the needs of our federal partners (e.g. USFWS) through NCTC?
3. How can we formalize a partnership with NCTC? MOU? Other?
4. How to develop classes? NCTC will oversee, but what does this consist of?
5. How do we deal with University tuition, etc. for classes? (NCTC will not charge tuition to administer classes)

Goal: The main goal is to gauge interest from Units in creating online classes through NCTC, identify steps needed to formalize a partnership with NCTC, and identify steps needed to formalize course-sharing across institutions.

Format: Brief group presentation by Pat Mazik of information/experiences with NCTC online classes. Discussion on interest, priorities, course development and formalizing a partnership with NCTC. Depending on numbers, we'll break into groups and each group provide an outcome for one of the above questions.

Date: March 10, 2016

BREAKOUT SESSION 2

Leaders: Sammy King (UL LA Unit), Scott Bonar (UL AZ Unit), Megan La Peyre (AUL LA Unit)

Title: **Science Communication**

It is increasingly common for graduates in Natural Resources to attain positions where they are responsible for communicating complex scientific topics to an increasingly skeptical and polarized audience. Most graduate programs in Natural Resources do not intentionally select students with strong interpersonal communication skills, such as conflict management, negotiation, and how to persuade, nor do they emphasize the development of these interpersonal skills or communication strategies in graduate training. Our breakout focuses on the challenges presented by diverse communication environments and media and the interpersonal communication skill sets useful for public meetings, landowner interactions, personnel management and agency negotiations.

The objectives of this session are to: 1) Increase awareness of this issue among Unit scientists and provide data why these skills are critically important for natural resources professionals; 2) Identify potential strategies to address this need; and 3) Provide some case examples where science communication and social skills have been integrated into graduate curriculums in Natural Resource schools. Some specific questions to be addressed are: 1) What training in science communication is currently available for Unit scientists, and is it adequate? ; 2) Does the structure and and cooperator focus of the Units provide unique training opportunities for our students?; 3) How can science communication be integrated into already full graduate programs?; and 4) What communication skill sets should our students attain during their graduate program?