

## Cheryl Penny Introductory Presentation

Question: What do we know about the mandate of National Parks?

Sue McAdam - Depends on the park, NHS, remote parks, national park, facilities, conservation, recreation, education.

Cheryl Penny – Conservation, for people? Ecological integrity.

- education, enjoyment and use for now and future generations
- if people don't use a park, it's not a Parks Canada a comfort level with this project now that wasn't there a few years ago
- we have an incredible opportunity here to achieve the mandate
  - learning and education
  - people have to be involved and knowledge is critical to this
  - we have to make this make a difference
  - have to reach Canadians so that this makes sense
- Short Horned Lizard monitoring program using visitors
- Good example of how to engage and involve visitors
- Needs to know from us who and how to involve people
- 3 provocative questions
  1. How do we become the **top of mind** with prairie researchers, provincial allies, with ranchers, with "western producer magazine", granting agencies,.....
  2. Who are the partners that we need to work with to make our job better (First Nations?)
  3. What are the tolls and knowledge that we will leave behind with students and staff? Transfer of knowledge.
- Story about childhood and tall grass prairie

John - Are researchers users?

Cheryl - not research for research sake – should plan field days, outreach extension, that kind of communication

Darcy - this is a heads up to include outreach in our research

## Tim Teetaert Presentation Summary of 2007 field season

- plot set up took 9 days
- should get fire training for the crew
  - o the whole crew was evacuated 3 times in 2006 for fires
- need training in basic first aid
- should meet community pasture folks
- vehicle maintenance and trouble shooting for quads
- 3 rounds of bird work

- 2 rounds of carabid beetle pitfalls
  - 3 hours/pasture/person is what is needed to cover all plots
  - grasshopper ring counts – first round abandoned; round 2 – O.K.
  - 2 rounds of sweeps – 4 May and July – 1 day sweep with 2 to 4 people
  - flag markers may affect the distribution of cattle
  - Loop flag markers may be an alternative
- Jeff
- bury sewer balls to mark sites and locate with metal detectors
    - o work and are permanent
  - Vegetation Sampling
  - Upland took just over a month
  - Valley – took a couple of weeks
  - 1 pasture per day, slower at beginning
  - team work worked well
  - They've saved a collection of rare, hard to I.D. plant
  - part of plant saved
  - middle of Whittaker not yet staked
    - o would need 520 stakes to complete
  - vegetation clipping took 2 weeks
  - drying and weighing took the most time
  - used Dan Johnson's oven (convection – in the shed)
  - 8 clip plots per plot – veg and litter
    - 5 plots/day (6 upland or 4 valley)
    - dry = 50-60 bags at a time
    - good labelling system this year
  - N probe sampling – exclusive sites and 10 miles in exposed sites
    - Not too much work, worked with distilled H<sub>2</sub>O

#### Results:

- Ungrazed mean = 70g more grass,
  - Litter = 30 gr. More (grawses/4 square metre dry weight)
    1. litter is what can be scraped up by hand
- 15% utilization on grazed
- total biomass
- Richness
  - 49 species/Whittaker on grazed,
  - ungrazed = 44

#### Nicky Koper preliminary results regarding power of study

- objectives:
  - importance of large scale experiment
  - compare ANOVA and regression design
  - advantages of regression power and appropriations & interpretation

- BACI design
- preliminary results presented
  - in almost all cases, regression design more powerful than ANOVA
  - for almost all large scale effects, we will have enough replicates (9)
  - for most small effect sizes we will have enough replicates
  - suggestion to include McCown's Longspur in the examples
    - o Savannah sparrows
  - Demonstrates that it is critical to do pre-treatment sampling
  - Reinforces 2 years of pre-sampling
  - Take home – sample prior to treatment
  - Large scale experimentation critical
  - Regression design better

**Cheryl wants a funding strategy call – before end of November**

- Birds and grass presentation
  - Point count sampling going very well
  - 130, 6 minute distance – sampled plots
  - 3 rounds, each 4-6 days
  - need to complete birding by June 30
  - can't be started before May 21-24
- Nest searching
  - Searched at 27, 300 x 300 plots
  - One plot got burned and was moved
  - Hired field assistant to increase sample size from 06 to 07
  - 185 nests in 2007 (133 were monitored) (16 SPPI)
  - o.k. but not target
  - 187 were done in 2006 with less effort (164 of these monitored)
    - o (19 SPPI)
  - pipit densities are very high compared to AB
  - such an intact area
  - no grazing effect on abundance
  - more pipits on uplands, similar to edge and habitat
  - avian diversity higher on burned plots
  - 5 different burns
  - nest densities – higher in upland (not slope)
  - higher nest in grazed than ungrazed
  - nesting success (modified Logistic regression)
  - no effect of visit date
  - only sample with different success from SPPI was SAUS
  - only sample to respond differently from SPPQ was LARB

**Discussion:**

- avian density up in grazed

- density of SPPI does not decline with grazing
- nest density higher in grazed
- nesting success not reduced by grazing
- virtually no trampling
- may attract insects
- future research and funding
  - o not expensive, ESRF funded
  - o ESRF should be continued but uncertain; cannot count on 2008
  - o Other funding sources?
  - o No other likely sources apparent

Darcy - give this presentation to livestock grazing industry

Pat - tough year for livestock industry  
 - do we have \$ for point counts for next year?
 

- o We could get a student working on it

 - may not be able to do nest searches (\$15 K. minimum)  
 - when are the results disseminated?  
 - ESRF report due in December  
 - Student working on it  
 - Nicky offered help to promote this project with these data

Darcy SOIL SAMPLING presentation

- why are we monitoring these variables?
- EI → Park Mgmt. Plan → Grazing → variability in pastoral grazing
- Want to avoid destructive sampling
- Need to sample at large scale
- Need to do it cheaply (keep lab costs down)
- A simple nutrient that is effective and important is Nitrogen

Jeff - describes the root soil probes  
 - root simulator  
 - now looking at background variability  
 - replaced in same plot (replacement necessary to avoid saturation)

Pat - baseline now; when do we resample?  
 Darcy - can we detect a grazing effect due to scale of probe

Jeff - repeat after 1, 5, 10 years  
 - found differences in other studies between grazed and ungrazed and the probes picked up these differences  
 - we should look at carbon practice with real soil samples

- detailed Phosphorus characterization would be very useful and he has a graduate student on this. Would need soil samples.
  - Small surface cores from small areas
  - He has funding to do analysis if we were to collect samples.
- Darcy - could we look at something at a smaller scale than we could apply to the experiment (distribution of nutrients)
- Ken - a lot of talk about redistribution of nutrients but very few measurements.
- Jeff - this is an emerging field of information
- Ken - he has a student looking at this in improved pastures
- Pat - could we change our methods and accommodate these measurements?
- could we put probe under dung or urin patches
- Ken - pour urea on top of a probe in soil
- Jeff - in terms of kinds of treatments, what do we have by research experiment?
- Ken - Kernan prairie (grazing experiment as well)
- burning it
  - opportunity here
- Jeff - probes would work well with management (burn graze)
- P, K, Ph
- would like 0-5 cm samples from all of our plots
  - 2.5 cm surface area
  - frozen or air dried for storage
  - better to freeze
  - plastic bag into freezer
  - may need to bag another freezer
- Sue Michalsky - have we considered soil biodiversity?
- Darcy - mites, ect. Were considered
- need apparatus on the site, logistically difficult
  - tough at this scale
- Pat - logistics doable, expertise a problem

Darcy - smaller scale study

### John's presentation on LAI measurements

- interest in assessing biomass / quality relationships

### John led the discussion on Grasshoppers & Beetles:

- discussed study beetles and David L. in Maple Creek
- discussed Dan Johnson's work to date
- could give David sub sample of grasshoppers and get him to try

### Cheryl Podemski Aquatic Sampling and Stream Crossings

- There are no prairie streams outside of parks that have not been damaged by agriculture and development
- livestock damage streams
- this represents a unique opportunity to document riparian management practices and to quantify damage
- DFO focus on education if possible but will use big stick if necessary
- MSc for for Cyndi Wlasichuk
- Starts in January
- Collected data last summer

#### Questions:

- how grazing changes stream morphology list
- bank erosion
- water table
- riparian shading and winter temp.
- riparian vegetation and terrestrial carbon subsidy
- water quality impact
- change in invertebrate communities
- sensitive to impacts
  
- not a lot of results yet
- stream properties
- community pastures have "V" shape
- ungrazed pastures have terraced "U" shape
- narrow stream trench when ripple runs
- where grazed, ripple destroyed by trampling
- soil compaction (penetrometer)
- network of erosion pins are installed
- 50 cm stainless Steel rods
- in October already saw soil erosion in 2 months (grazed)
- water quality samples
- partial size

- may install solar power samples
  - tens of thousands of dollars
- Ken - how do you account for upstream impacts?
- Cheryl - tough to do
- stream channel shading (occludometer)
  - PAR with water depth
  - Macrophysics collection (“Rock snot”)
  - Water temperature sensors are installed
  - HOBO (\$200 each)
    - o Temperature reading every 30 minutes
    - o Pools now, next summer, pools & riffles
    - o Water quality
- Colin - but thee streams have been grazed for 100 years
- Cheryl - cattle impacts in streams is disproportionate and great.
- Pat - the cattle impact we can see on a very lightly grazed field.  
Bodes unwell for heavier intensity treatments
- Gary - why is Colin uncomfortable?
- Colin - value judgement
- what is it we are trying to communicate
  - how might a producer hear this message
  - some ranchers have “healthy” waterways
- Darcy - how is GNP representative of national range of variability
- Pat - how can PCA manage both plains minnows and McCown’s longspur
- Sue McAdam. - Piping Plover & sturgeon
- Cheryl - DFO has to evaluate how large the footprint is
- DFO provides operational guidelines
  - All scales of response to an impact on streams
  - Livestock absolutely have an impact
- Gary - credit to this group that we have recognized effects of creating terrestrial heterogeneity on aquatic systems
- Michael - is it possible that grazing treatments may not have impact on riparian area because we provide offsite water?

- Nicky - how long will it take until you shut us down
- Cheryl - won't happen for this project because it's research  
 - could be affected by listing of plains minnow  
 - DFO needs data on impacts on aquatic system  
 - Data have land mgmt.
- Pat - we could apply for a permit to destroy habitat
- Cheryl - cannot use regressive design for aquatic study  
 - given this environment, this a regression design should be there to compare different treatments (exposure to impact)  
 - water quality
  - o DO, pH, temperature
 - Channel sediment
  - o 4 samples per pasture
  - o organic content
 - N signal should increase with manure  
 - Aquatic invertebrate collection at 18 sites  
 - Better if treatments were low to high upstream and downstream  
 - 3 minute kick sample with a dip net  
 - found fish living in every single pasture – except pasture 1  
 - Black Bullhead  
 - Lake Chub  
 - White Sucker  
 - Stickleback  
 - Evidence of *Pyganodon grandis* shells in large numbers up to pasture 2
  - o Evidence of permanent water – a long-lived fresh water Mussel – do not move; cannot dry out, could be up to 10 year old animal; none of them live.
 - Stream crossings  
 - Need a culverts and armoured crossings (fiords)  
 - Plans for 2008
  - o Long list includes looking for additional funding
  - o Clearly an expanded program
  - o Add 20-30 new sites
 - want to get Gary Scrimgeour involved
- Sue Michalsky - can we focus on biodiversity rather than disturbances  
 - grazing is a “natural” disturbance like fire  
 - there are bison wallows in creeks like cattle  
 - gearing research to field something we already know
  - o findings are pre-determined
 Cheryl - disagreed that the findings are pre-determined

- Gary - also doesn't think that the outcomes are predetermined but agrees that there are some useful predictions
- Sue Michalsky. - should provide a cautious message for ranchers, community in the riparian impact issue
- Gary - these are value issues  
 - grazing is a natural disturbance but cattle are not necessarily a good mimic of bison grazing  
 - what are Sue's levels of discomfort
- Sue Michalsky - mainly links between conservation and agriculture. Others are making progress working on riparian health in livestock. If the views she heard today got into the "Western Producer", then we could have to shut down our program. We should focus on the biodiversity. Grazing is not just a disturbance.
- Rob - Grazing is a disturbance we are trying to measure that.
- Colin - have to connect grazing and conservation – understanding that there are value assumptions heard in our perspective of the positive/negative effects of cattle impacts.
- Pat - we also need to be cognizant of Cheryl's observation of how damaged the prairie is now that we cannot find reference sites. These streams in GNPC are the best of a bad lot. We are measuring effects, there will be different interpretations of these effects.
- Pat - problems of treatment locations within the existing design.
- Cheryl - understands the need for random allocation of plots. Cannot use our design - should use a reference condition design.
- Colin - possible expansion of experiment? Possible to replicate at a private ranch.
- Cheryl - sure. Once build a reference condition., we can use it to compare it to anything. (other activities for instance)
- Darcy - riparian health assessment comparison
- Cheryl - yes. Assessments are qualitative but before do it would be great to use both here.

## Sharon Thomson presentation Archaeology on the grazing experiment

- starts with collection of slides of archaeology sites
- cairns (pasture 2)
- sweat lodge (pasture 8)
- Teepee ring (pasture 8)
- concentration of stone flakes (knife river flint)
  - o probably originates in N. Dakota
  - o lithic scatters are sparse in GNP
  - o The quantity of KRF seems comparable to other sites in southern Saskatchewan and Alberta.
- selected 26 sites in grazing experiment
- near and far from water and roads, fences
- 3 to 4 sites in each grazed pasture and 3 to 10 in control
  - o idea to visit sites in year 5 & 10 for moderately grazed pastures and in year 2, 5 & 10 in high intensity pastures
- checked impact of proposed fence line
  - o she found 6 sites n the fence lines have been moved as a result
  - o she's installed monitoring pins
  - o photo points
  - o permanent sampling grids to get a feel for artefact
  - o 26 sites to be monitored
  - o inspected 4 additional sites for fence construction
  - o don't like fences through sites, particularly large sites that are significant. She's sensitive to the fact that this is a grazing experiment but if grazing is going to continue longer than 10 years she would request more changes.
  - o 3 recommendation for fence movement
- water pipeline relocation in one location
- monitoring in 2009, 2012 and 1017 to assemble photo and descriptive record fo observable change sin cultural resource condition

Ken - why don't we move fence lines now?

Sharon/Rob - would have to shift permanent sampling points and would exclude some landscape types.

Pat - artifacts here are robust. Most vulnerable sites have been detected

Sharon - o.k. within the experiment – this is not ideal but tolerable.

## Colin Schmidt presentation on Communication & Interpretation

- how to get the science to the people
- Mega-grazing experiment – science & interpretation – uncomfortable bed fellows
- when was the last time you intentionally changed your behaviour?
- Burkina Faso, West Africa 1994
- Emotion is what drives us to change
- Water hugely scarce and important
- How do we learn?
- Hockey & skating story – student focussed
- Learned how people learn
- What the student thinks is fun and interesting
- Have to break down the message
- Make it interesting, make it about play
- Why the focus on behaviour change
- Our deepest conservation challenges are behaviour changes
- Give access to information and experiment
- To do, to participate
- Not what does GNP want them to learn, what do they want to learn?
- Give them the opportunity to try
- We now need to tell the story
- Colin's ideas
  - o Getting stuff published
  - o Getting research staff to communicate with the community
  - o Volunteer opportunities
    - Individuals and school groups
  - o Regional students
  - o This work carried out through the school year
  - o Monthly site visits from local students
  - o Ways to get info to staff and to Ottawa
  - o Ways to make land monitoring public
- Soil biodiversity tool
  - o personal education
- SK. Youth
  - o Prairie learning centre
  - o The park is the classroom
- Natural history clubs
- Ranchers, Mankota Community Pasture patron Meetings

Rob - is there a need for a pamphlet on the grazing experiment?

Colin - perhaps a thematic newsletter from the park on grazing experiment  
 - newspapers or “western producer”

Nicky - was interviewed on CBC Regina and Winnipeg

### Pat Water and Fencing update

- pipeline has been laid, but pump has not yet been installed.  
Troughs are out
- fencing contract let in August, low bid
- contractor may be able to meet conditions of contract
- options
  - o could defer a year
  - o push hard and try to get it done
  - o need weather to cooperate
  - o could do environmental damage
- what are the experimental design consequences of deferring for a year?

Darcy - more baseline data, but less data for students

Pat - nothing we can do about the contract  
- could disqualify this contractor and go with someone else  
- contract deadline is Dec. 15<sup>th</sup>

Nicky - but we have a month to do this job

Michael - but we can't go ahead and do this work ahead of the contractor and not pay them

Pat - second bidder doesn't want the job  
- want cows for second week of May (May 25<sup>th</sup>)  
- could fence in riparian areas now to minimize damage  
- the contract does not specify a start date

Darcy - can we continue to contact the successful bidder?

Gary - how many person days required to put up fences  
- 19 miles of fencing

Pat - other risk is to contract the cattle can't do that without the fence.  
The contracts are ready to go but they have not been let yet.

Gary - Should we delay putting in livestock?

Darcy - how much of a delay?  
- Fall?  
- Different foraging patterns

- Pat - mid-June versus mid May  
 - depends heavily on the weather
- Ken - there will be a ton of yearlings next spring because the market has crashed. The problem is the fence.
- Cheryl - can you let a cattle contract quickly with Public Works?
- Pat - not sure, but should not be a problem.
- Ken - we could probably delay until Feb. 1 to let the cattle contract. Then they will know if they are going to keep them for grassers or sell them.
- Sue Michalsky. - electric fence?
- Pat - not much cheaper, not reliable enough for our purposes
- Sue Michalsky. - have to point out to the successful bidder that he can't do all the work now.
- Cheryl - delay for a year would not affect him
- Nicky - has told her students that she won't believe that a fence will be built until she's seen it.  
 - her issue is not with the students, but her ability to get a paper from grazing experiment before she applies for tenure
- Ken - has a student coming on but could switch that if he has to.
- Cheryl - won't be a complete disaster for anyone.
- Ken - has grant applications now based on this.
- Pat - we'll talk with the successful bidder, we'll get as much work done until snow flies.
- Nicky - December is early enough to change plan for next summer  
 - perhaps not all veg. Sampling  
 - do the burn study – need some composition information then  
 - grasshopper rings – we still don't have 2 years of this  
 - have to have a discussion about student allocation by Christmas  
 - financial effects of dallying a year
- Ken - knowing by December would be beneficial

- Mike - could the park risk manage fencing the low lying areas this fall to ensure these are done before spring
- Pat - need to determine this with a contracts person
- Colin - Parks labour team is small and this already has been extended so this might be a challenge
- Gary - don't want to lose momentum

Michael Fitzsimmons presentation Environmental Assessment follow-up

- Bran Nobel provided a framework to assess whether the mitigations were undertaken and effective
  - Ashley Wruth is conducting this follow-up
  - She will have question for us to see if our data can answer these mitigation challenges
  - Not much money available to independently conduct follow up
  - Ashley needs to report back to managers and public that while we are allowing this project, the mitigations are effective
  - So far she has found very few, very minor violations
  - Ashley will be monitoring fence if and when it gets built
  - She'll probably focus on next year
  - Cattle and fencing
  - Put follow-up report on website
- Gary - are funds for EA outside the EBGE budget?
  - Rob/Pat - yes
  - Mike - the process helps to mitigate research

Walter Willms Partnerships – U of A, AAFC (Onefour), EBGE

- provide sampling and research objectives
  - develop complementarity in our work
  - Onefour 17,000 hectares in size
  - we met in spring to discuss options for partnerships
  - I talked about MOA versus letter of support
  - Onefour stability is no longer an issue
- Darcy - Last Mountain Lake and PFRA with EC, started as an informal agreement
  - MOA, small scale
  - formalized into an MOA

- IRF has 50% \$ increase
- Melissa Vance in charge

Ken Wahlberger presentation Proposed cattle distribution study

- continuous, season long system is the hardest system on the environment
- more interest in looking back at the old stocking site literature from Europe
- pasture based grazing systems
- low stocking rate will patch graze and use pasture inefficiently
- cattle distribution affected by water
- if you distribute water to upland you pull it out of the equation
- Baily 1995 – heterogeneous environment alters how cattle move
- 3 possible outcomes from grazing intensity distribution relative to water

increasing = likely

flat = possible

Decreasing = Unlikely

- use does not always correlate with utilization
- Coe et al 2001 - cattle closer to H<sub>2</sub>O than pasture graze
- however Wallenberger (in press) during peak grazing time, cattle far from water
- objectives
  - o beef cattle distribution
  - o diet composition
  - o *one more I missed*
- has funding for 30 GPS collars – University equipment grant
- 150 day grazing permit (Kedzig)
  - o 1 observation avg. 20-30 minutes
  - o ambient temperature
  - o head up, head down
  - o location
    - 3- 10 errors in location
- ocular utilization estimates with GPS
  - o correlate this w/ LAI
  - o create utilization maps on each pasture
  - o every 30 days
- forage production measures with production cages
  - o grass, forb and shrub

- etoliated growth determined each spring
  - o gross carbohydrate resources
  - o Romo + Harrison 1999
- Redistribution of nutrients
- Differences in stocking rates effects on C and N
- Botanical compensation of diets
- Microhistological analyses of fecal samples
  - o \$250/sample,
  - o 30 days
  - o done in house cheaper
  - o corrected for bias in digestion
  - o total N and C

Darcy - how many grad students

Ken - 1 grad student, microhabitat  
 - 1 grad student - ocular estimates

Jeff Schoenau presentation soil characteristics under grazing

- why a decline in sage grouse
- quantity of food and habitat
- looked at soil nutrients
- E& W Block of GNP and Consol PFRA pasture
- Soil characteristics
- Parcel grazed and ungrazed samples
- Butte creek EB
- Frenchman WB
- Consol willowcreek in PFRA
- probes in for 21 days
- total N same in grazed and ungrazed
- plot N – same in grazed and ungrazed
- P same in grazed and ungrazed except in control site
- Higher in ungrazed
- Also in plant phosphorus
- Conclusion
  - o Normal grazing does not affect fertility of sage brush or soils
- What might we measure
  - o 10 cm. Depth
  - o also measure particulate carbon (new)
  - o extractable nutrients
  - o 24 hr. supply with PRS probs
  - o could measure 80 soil samples
  - o on 15 to 20 do detailed assessments
    - chemical specification, IR, cyclotron spectroscopy

- may be possible to go for NSERC strategic to look at food web nutrients
- Gary - probably not a powerful enough design to detail a difference but robes have potential
- Jeff - lots of variability in probes
- Nicky - compare probe measure to cow dung densities to be able to stratify your sampling strategy
- Jeff - would be happy to visit the site to sample design
- Pat/Nicky - Funding situation
  - have carry forward \$70K from last year
    - may have to use for creek crossings?
  - priorities
- Nicky - No
- Pat - has a lot interest in microtines. Tough to do.
- Darcy - what did it cost to do the monitoring program?
- Nicky - 4 people (students and PA)
  - RA = \$8700 to \$9000/year
  - Student = \$14,000/year
  - Main expense is stipend for students
  - Costs ~ \$70K/year to run monitoring program
  - \$48K = people
  - \$10K = truck and gas (1 truck)- Enterprise)
    - fleet \$133/km.
    - CWS uses Central Vehicle Agency (CVA)
    - 10,000 km limit.
  - Fuel = \$5-\$10 k
  - Power = \$5 k
- Nicky - 1 full sampling year = \$64,400
  - RA 9,066 x 2
    - stipend 16,000
    - truck 7,000
    - field supplies
  - does not include next searching
  - collection but not analysis
- Gary - scaled down fish = \$56 K for two years

- he can get ½ from Calgary Service Centre
- he would want the other half from us
- he's looking for \$28K

Options for getting money:

- IRF with links to one/one or DND
- SAR funding in transition
- Invasive species fund – not frozen
- Transboundary fund (EA ) frozen
- HSP – has to be done outside the Parks Canada could use it on Mankota community pasture
- “program evaluation”
- intended for SAR
  - o plains minnow?
- Fish and wildlife development fund
  - o \$5 to \$10K funding possible
  - o Sue should help with what they're looking for
- NSERC may support program
  - o To fund research station
  - o Field manager
  - o Need a consortium of universities that use the field station
  - o No idea how likely
- All NSERC deadlines have passed
- NSERC focus grants
  - o Soils was the focus this year
  - o Need this year's data to build a stronger proposal
  - o Will go for it next year
- NSERC/Ag Canada/Industry
  - o Costs split 3 ways
  - o Apply any time

Jeff - may have been phased out

Walter - has been suspended at best

Sue Michalsky. - Ag Farm Plan – not sure about research dollars
 

- o not likely

 - Invasive Species – not sufficient invasive species in area

Nicky - made clear she is not going to be able to bring in big \$\$ (\$10K or so) to contribute to the \$65K needed

Darcy - needs itemized list of in-kind contributions to use for grant applications
 

- Innovation Fund?

- TNC has an identical project on Palouse Prairie (Eastern Oregon)
  - o Could be complimentary project

- Darcy
- Data mgmt. Intellectual Property
    - o Falling by the wayside
    - o need training

- Colin
- communicaton costs
  - Innovation Fund for communication?
    - o Colin to find out

- Pat
- doesn't think it is desperate
  - perhaps there is a future with CWS and EC
  - by Christmas things will be clearer

IN KIND:

PCA	<ul style="list-style-type: none"> <li>- Quads</li> <li>- rhinos</li> <li>- house – power.water,phone</li> <li>- fuel</li> <li>- website</li> <li>- insect ID</li> <li>- N probe analysis</li> <li>- riparian health</li> <li>- LAI</li> </ul>	<ul style="list-style-type: none"> <li>\$65 K/year</li> <li>\$50K labour</li> <li>\$10K vehicles</li> <li>\$5K supply</li> <li>bird pts.</li> <li>grasshoppers</li> <li>beetles</li> <li>by production</li> </ul>
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