



**Report Title: Wildlife Movement Western Science Experts Workshop**

**Working Group: Sustainable Ecosystems Working Group**

**Final/Approved Report Date: May, 2006**

**Contract Number: UCSE0106**

**COPYRIGHT # Pending**

*\*\*\*All information contained within this report is owned and copyrighted by the Cumulative Environmental Management Association. As a user, you are granted a limited license to display or print the information provided for personal, non-commercial use only, provided the information is not modified and all copyright and other proprietary notices are retained. None of the information may be otherwise reproduced, republished or re-disseminated in any manner or form without the prior written permission of an authorized representative of the Cumulative Environmental Management Association.\*\*\**



## **CEMA Disclaimer**

**Contract Name: Wildlife Movement Western Science Experts Workshop**

**Consultant Name: Wildlife Movement Task Group of the Sustainable Ecosystems Working Group in association with Golder Associates Ltd. and URSUS Ecosystem Management Ltd.**

This report was commissioned by the Wildlife Movement Task Group (WMTG) of the Sustainable Ecosystems Working Group (SEWG) of the Cumulative Environmental Management Association (CEMA), in its task of developing a management framework recommendation to address the cumulative effects of development in the Regional Municipality of Wood Buffalo that would ensure the maintenance of effective habitat connectivity for wildlife within the region. Specifically, this workshop was intended to acquire sound information on objectives to be broad in regional scope, not limiting to any particular landscape feature in:

- 1) Reviewing the issues relevant to wildlife movement in the region and prioritize them
- 2) Discussing some potential approaches to address the major issues
- 3) Proposing the best approach to accomplish the goals of the WMTG
- 4) Providing recommendations for the western science approach.

Ultimately, the results of this review will be used to help inform decisions regarding a western science approach to ensure maintenance of effective habitat connectivity for wildlife.

This report has been completed in accordance with the terms of reference issued by the Wildlife Movement Task Group. The Wildlife Movement Task Group has closed this project and considers this report final.

This report does not necessarily represent the views or opinions of CEMA, SEWG, or the Wildlife Movement Task Group.

The conclusions and recommendations contained within this report are those of the workshop participants, and have neither been accepted nor rejected by CEMA, SEWG, or Wildlife Movement Task Group.

Until such time as the Sustainable Ecosystems Working Group issues correspondence confirming acceptance, rejection, or non-consensus regarding the conclusions and recommendations contained in this report, they should be regarded as information only.

For more information please contact CEMA at 780-799-3947.

**Wildlife Movement Western Science Experts Workshop**  
**Final Summary Notes**  
**Coast Terrace Inn – Edmonton, Alberta**  
**March 14, 2006**  
**8:00-4:00**

**In Attendance:**

Guests/Experts:

Martin Jalkotzy (Facilitator) - Golder Associates  
Corey De La Mare (Presenter) – Golder Associates  
John Kansas (Presenter) – URSUS Ecosystem Management  
Stan Boutin - University of Alberta  
Lee Foote – University of Alberta  
Sophie Czetwertynski – University of Alberta  
Miles Scott Brown - Integrated Environments Ltd.  
Danah Duke - Miistakis Institute for the Rockies  
Scott Grindal – AXYS Environmental Consultants  
Chris Godwin Sheppard - AMEC Earth & Environmental,  
Rick Lauzon - WorleyParsons Komex  
Dave Westworth – Westworth Associates Environmental Limited  
Ann Hubbs - Alberta Sustainable Resource Development, Fish and Wildlife Division  
Matt Besko – Alberta Sustainable Resource Development, Fish and Wildlife Division  
Helene Walsh – Canadian Parks and Wilderness Society  
Ron Pauls – Syncrude Canada

Wildlife Movement Task Group Members:

Peter Weclaw – ASRD, Fish and Wildlife Division (Co-Lead)  
Dennis Kohlman – Petro Canada (Co-Lead)  
Margaret Herculson (Scribe) – SEWG Program Manager  
John Brownlee – Alberta Energy and Utilities Board  
Bill Kovach – Shell Canada  
Kevin Hannah – Canadian Wildlife Service  
Mike Norton – Environment Canada  
Joanne Hogg – Canadian Natural Resources Limited  
Leo Paquin – Suncor Energy

**Introductions:**

The breakfast and social occurred from 8:00-8:30 and then introductions and the agenda review occurred from 8:30-9:00.

**CEMA/SEWG/WMTG Background – Peter Weclaw**

Peter Weclaw led the opening discussion with a presentation with a brief background review of the Cumulative Environmental Management Association (CEMA), the Sustainable Ecosystems Working Group (SEWG) and the Wildlife Movement Task Group (WMTG). The presentation is attached but the highlights include:

- SEWG Mandate
- SEWG Goals
- Overview of the WMTG
- WMTG Goals
- Work completed to date by the WMTG
- Future Plans
- Workshop Objective
- Indicators
- Major Issues
- Workshop Process

**The following 3 sections were displayed on posters around the room to keep the meeting focused:**

**1. Workshop Objective/Overview:** The objective of the workshop is to be broad in our regional scope, not limited to any particular landscape feature.

- 1) Review the issues relevant to wildlife movements in the regional and prioritize them.
- 2) Discuss potential approaches to address the major issues.
- 3) Propose the best approach to accomplish the goals of the WMTG.
- 4) Provide a recommendation for the western science approach.

**2. Indicators:** The indicators discussed will be confined but not entirely limited to:

- 1) Moose (seasonal movement)
- 2) Black Bear (preference for movements in some habitats)
- 3) Wolf (dispersal movements)
- 4) Lynx (dispersal movements)
- 5) Fisher (home range movements)

**3. Major Issues:** Some of the major issues identified by the WMTG are:

- 1) Adjacency of mines and river valleys.
- 2) Cumulative effects of logging and in situ operations and importance of riparian habitats.
- 3) Consequences of disrupted natural movement patterns (e.g., predator-prey interactions, limited access to resources).
- 4) Metapopulation and source - sink dynamics.
- 5) Barrier effects and isolation.

- 6) Recolonization of reclaimed areas (stepping stones, cross-mine movements).
- 7) Design of effective movement corridors.
- 8) Noise and sensory disturbance.
- 9) Study area locations (land use, ecodistrict and landscape) - why need to study in different areas.
- 10) Design a system that would ensure connectivity of habitats for wildlife in the region

**Questions:**

**Q:** Why was Woodland Caribou not included on the indicator list?

**A:** SEWG does not wish to duplicate the effort of other groups that may be looking at other important and related issues in the Regional Municipality of Wood Buffalo (RMWB). Therefore SEWG works to identify and interface with other organizations/initiatives. In this instance we are interfacing with the Alberta Caribou Committee who is already conducting work on caribou and their work will ultimately be included in recommendations based on their findings.

**Current Projects in the RMWB – Corey De La Mare**

Corey De La Mare delivered a presentation on some of the current and past projects that have already occurred in the Regional Municipality of Wood Buffalo on wildlife movement. The presentation is attached but the highlights include:

**Assessments of River Valley Use**

- **Suncor Millennium and Steepbank Corridor Assessment (since 1997)**
- **Albian Sands Muskeg River Mine (1999-2004)**
- **Shell Jackpine Mine – Phase One (2005-2006)**
- **Canadian Natural Horizon (2003)**

**Sensory Disturbance Assessment**

- **Suncor Millennium and Steepbank**
- **Fort Hills Oil Sands Project**

**Questions:**

**Assessments of River Valley Use – Suncor Millennium and Albian Sands Examples**

**Q:** What period of time was this work done?

**A:** January-March.

**Q:** Were there any fertilized areas that would have skewed the information? Fertilized clover, for example, can skew results.

**A:** No, most of this area was pre-development. Point taken regarding fertilized clover but it wasn't a factor for this study period and location.

**Q:** Did you look at snow depth as a co-variant?

**A:** Yes, felt it wasn't too deep to be a limiting factor but this can vary from year to year and is considered.

#### Assessments of River Valley Use – Shell Jackpine Phase 1 and Canadian Natural Horizon Project Examples

**Comment:** Jackpine – Phase 1 work just started last year so there are no results yet.

**Comment:** Canadian Natural Horizon Project used natural and linear features to place remote cameras. The track count results chart represents count.

#### Sensory Disturbance Assessment – Suncor Example

**Q:** What are the habitat types like?

**A:** Pretty similar. The upland area has a little more of a treed bog than the corridor river valley areas but all others are fairly similar.

**Q:** How many cameras were used?

**A:** Eight cameras were used in each study area. There were a combination of different types of trigger systems used; 4 active and 4 passive.

**Comment:** Noted that wolves used the corridors in the winter and the upland areas in summer.

**Q:** Did any other species, other than those discussed and included in the presentation, use the corridors?

**A:** There was nothing definitive. The use of corridors more in the winter where snow was not as deep was noted.

#### Sensory Disturbance Assessment – Fort Hills Example

**Comment:** The sensory disturbance assessment is summarized on the last 2 slides of the presentation.

**Q:** Was there any snowmobile traffic on linear disturbance?

**A:** Only the biologists tracks were noted.

**Q:** Did the biologists note if the wolves traveled over the snowmobiles tracks?

**A:** Didn't note any tracks but assumed they would.

**Q:** How much can be explained by habitat preference as opposed to disturbance proximity.

**A:** Most was habitat preference but noted a slight difference in use based on proximity. Moose for sure by habitat. Wolf used linear features more.

**Q:** What have you learned from this and in the go forward what can you tell us?

**A:** Used previous programs to look at variability on species and try to determine preset effects. We wanted to know if we could determine percentage of difference. We have definitely learned. The items in EIA requirements are based on movement which is hard to study. What we are collecting is habitat features and looking at trends based on disturbance. It is useful in determining zone of influence by disturbance.

**Q:** Is it useful? It is suggested that it is useless in looking at riparian areas.

**A:** Perhaps moose and fisher are better indicators then. It would be useful if we expanded the scope and looked at a larger area. If we pool data we can get there. It is useful for indirect effects. Approval conditions ask for appropriate set backs.

**Comment:** Temporal aspects could be important too. If you repeat the study you can see what the impacts and changes are. That would be more useful.

**Comment:** Proponents are tied to approval conditions. So there is a trade off. The proponents are saying we are doing this but not getting any answers.

**Comment:** The question is do we have a sustainable population and then look at a larger spatial scale.

**Comment:** This research is good for looking at habitat types and how they are used but wouldn't address movement over the larger landscape.

**Comment:** The proponent can tell us if we still have movement as development proceeds. We can say we have individuals moving but don't know if it across.

**Q:** Is the best data coming out of telemetry studies?

**A:** Yes. We are doing baby steps. We need to address movement and populations on a larger scale.

### **Example Techniques and Approaches – Corey De La Mare/John Kansas**

Corey De La Mare led us through a discussion on what techniques and approaches are being used to study wildlife movement in the RMWB. Corey's presentation is attached.

#### **The main methods discussed were:**

- Track Counts
- Backtracking,
- Remote Cameras,
- DNA fingerprinting or hair snagging, and
- GPS collaring

#### **Questions:**

**Comment:** It was noted that predator traps did not come up. Some felt that coyotes and increased predators is a concern. Predator prey dynamics in corridors is a key issue. If you design a perfect corridor, what does it lead to? Sink source dynamics.

**Q:** What about scat collection?

**A:** Noted that DNA quality is medium with this type of method.

**Comment:** One benefit with backtracking is being able to apply statistical methods to address this issue. There is a study being done that is working well on this in conjunction with radio collaring (John Kansas can provide further information if required.)

John Kansas provided us a presentation (attached) on what his company, URSUS Ecosystem Management, has been working on for Devon Canada in the Christina Lake area since 2002. It is a very intensive winter tracking program that has been conducted for the past five years, every winter, since 2002. It is designed strictly for monitoring purposes. In the last two years they started back trailing 59 kilometers of caribou trails. Recalling that Simon Dyer's work which implied linear features are largely avoided in the boreal. John's study found caribou used linear features 23% of the time. What happens is they get on linear features, run or walk fast for a short time, and then go into the lichen areas and stay in there to forage. They also did back trailing on fisher, lynx, coyote, wolf, and caribou. In 3D seismic coyotes will walk along the edge and will get food off inside edge of the line. Back trailing can give you this where no other technique, to the best of John's knowledge, can.

### **Wildlife Habitat Classification Approach – John Kansas**

John Kansas the provided an update on the work he is doing for CEMA on wildlife habitat classification mapping. Presentation attached.

**Comment:** Perhaps URSUS's wildlife habitat mapping product could help to stratify out the habitat preferences before using some of the other techniques discussed seeing as movement and habitat are intimately linked.

**Comment:** Don't think it would be much more difficult to take the next step of overlaying the human disturbance over the work already done?

**Q:** The habitat moose habitat suitability map for moose shows moose along the rivers. However, Corey's De La Mare's research is not showing this pattern. Why is this?

**A:** John Kansas feels that the stream orders can explain this.

**Comment:** There are wetland species that play by different rules. There are obligates that are qualitatively driven. Muskrat, river otter and wetland fowl for example.

**Comment:** The point is that habitat mapping shows us that habitat is ideal along the river. We don't need to reinvent that. What we need to ask what is we would need to do to make this habitat critical. Regulators need to tell us what we need to see and then we can develop the scientific approach to do this work.

**Comment:** ASRD noted that, as regulators, there are objectives and targets that they need to define and make explicit to agencies and stakeholders. A lot of this is stakeholder driven and informed. ASRD needs to be clear as to what the stakeholders want with respect to where and when for objectives and targets. The stakeholders and CEMA need to define what kind of numbers they want and outline what will it take to get those. Then government can regulate this.

**The main techniques/approaches agreed to consider for our purposes today are:**

- 1 Radio telemetry - GPS collaring
- 2 Snow Tracking
- 3 Snow Backtracking
- 4 Aerial Survey
- 5 Remote Cameras
- 6 Genetics (including scat)
- 7 Landscape Modeling

**Uncertainties and Knowledge Gaps:**

The following Q/A session and comments addressed some of the broader issues that are beyond the mandate of this Task Group but were noted as relevant concerns to be considered.

**Q:** Is there a convention that could take a big holistic look at this wildlife movement issue?

**A:** At this juncture CEMA is not mandated to look beyond the RMWB. We have lots of data but we don't have the context for the larger RMWB.

**Q:** Who could address this?

**A:** Regional stakeholders in conjunction with ASRD. The regional stakeholders need to identify the issue and then have ASRD tell us what they want to see done.

**Comment:** Out of this workshop there could be a process that defines appropriate indicators and then the research framework could kick in.

**EUB Comment:** From the Board's perspective there is a policy vacuum. The Board continues to make decisions, as we have now, in that the applications that are weighed based on their merit individually. However, we would rather have a policy framework in place. That is why the Board is actively participating on these groups.

**Comment:** Another concern that would need to be reviewed is the quality of our Northern data sets. They are inadequate to have comparable analysis due to the extremely old phase data. We could request to have this data updated but what will this tell us? How will it be useful? It could be important to move this task ahead. We need to identify if there is a need to be looking over the entire area because right now we are only looking in select area. It is most cost effective to look from general to specific. Right now we do not know if we are hitting the hot spots.

**Comment:** When appropriate scale falls out we may note the appropriate questions.

**Other concerns raised by participants:**

- 1) Assemble the wildlife data collected in the region to date.
  - a. Provide a database for above.
- 2) How wide is wide enough? (corridors) Location? (upland or drainage).
- 3) Ecological knowledge (basic research for key species).
- 4) Ecotoxicology / wildlife health.
- 5) What spatial or temporal scale do we / are we looking at? Is this appropriate / adequate?
- 6) Are movement corridors important for the indicator species we are addressing?

Ultimately we hope to have a clear direction with where we think this should go. For our purposes today, however, we want to focus on what the issues are and which species to look at to address these issues.

**Issues Review – Group Open Discussion**

The intention of this portion of the workshop is to revisit and revise the issues that are posted and in the meeting package handouts. Once we have the revised list of issues, we can determine what techniques can/should be used to address each of these issues.

Again, the issues already identified by the Task Group are as follows:

- 1) Adjacency of mines and river valleys.
- 2) Cumulative effects of logging and in situ operations and importance of riparian habitats.
- 3) Consequences of disrupted natural movement patterns (e.g., predator-prey interactions, limited access to resources).
- 4) Metapopulation and source - sink dynamics.
- 5) Barrier effects and isolation.
- 6) Recolonization of reclaimed areas (stepping stones, cross-mine movements).
- 7) Design of effective movement corridors.
- 8) Noise and sensory disturbance.
- 9) Study area locations (land use, ecodistrict and landscape) - why need to study in different areas.

10) Design a system that would ensure connectivity of habitats for wildlife in the region

**Comment:** It was noted that there were 3 general issue categories; causal elements, effects and responses and management issues.

It was suggested that we could shorten the list by grouping numbers 6, 7, and 10 as they are regarding the design of corridors or designing approaches for connectivity. **E.g. Configurations and effectiveness for design criteria for corridors.**

With respect to number 6, the recolonization of reclaimed areas, it was decided to keep as separate issue since there should be a minimum time frame for criteria of reclamation. We need to maintain corridors so we would only agree to mine underneath these corridors, for example, once the corridor was replaced.

Issues 3, 4, and 5 can be grouped together as the bottom line is the maintenance of the populations. These issues all address movements and maintaining connectivity on landscape for indicator species. We can also ask “Does connectivity matter at all?” or “How can we look at movements for the indicator to enhance or ensure that movement occurs?” **E.g. Why are corridors important to maintain metapopulations and what mitigations are important to maintain this?**

We agreed to discard issues 2 and 8.

**Comment:** It all comes down to numbers and population. What data will you accept to tell us that corridors are important? What tells us that an indicator needs corridors to be viable. It is great to ask the question, but scientifically we don't know if we can do that. We could set a broad objective for target number of animals. It would then be easy to monitor for that target. We would have to figure out what the target number should be which is where it becomes difficult. Scientists talk about Minimum Viable Population (MVP) or target populations but it should be above viability. We could also get the gene frequency to determine if we need frequency.

**Comment:** There is no data to show there is a metapopulation. For fisher, what tells us and where there is a metapopulation issue?

**Comment:** We don't want to manage connectivity for connectivity's sake. We need to question whether corridors are important. We need to know what species connectivity is important for. If it is determined that connectivity is important we then need to know that the habitat is something the animal uses. We can then design the buffer distances and then test this. However, this may not be the best way to go.

**Comment:** We want to look at high suitability habitat and look at connectivity in those areas rather than riparian areas and then look and industrial activity within those areas.

**Comment:** We need not to manage status quo, and then for what is happening over the landscape. Look at beaver over 10 years and moose for seasonal movement. Maybe for some of the indicators, we need to look at the right habitat for species to get through the oilsands so they can maintain connection with each other. These corridors will allow animals to better redistribute in reclaimed areas if they are willing to use them.

**Comment:** We need to know that corridors are a good thing and this is what we are striving for. We cannot definitively state that corridors are critical. There are some indications that connectivity for moose are important. The telemetry that Hauge, Keith and Fuller conducted shows that seasonal movements show basic habitat requirements. Once you determine this, then you can say you want to maintain this. In a fragmented landscape corridors will become more important. This also depends on whether the species is a habitat specialist or not.

**Comment:** Some people felt quite strongly that seasonal movements play a key role depending on things like snow depth. Can we design for climate change?

**Comment:** There are also other important issues around avoidance and disturbance with regards to linear features. E.g. Speed limits, limiting access. Mitigative measures for these issues are important.

**Comment:** There are as lot of other questions and issues that are important to note that will not be addressed by us today such as: “If we want to maintain corridors, how wide would they want to be?” or “How close can you mine to the Athabasca River and what do you look at for open pit mine and reclamation for those areas?” or “As a manager, what do you do when you see a difference; start reclamation along the river to manage this issue right away”?

### **Revised and Ranked Issues Results:**

Based on the discussion, the issues previously provided were revised and then ranked using a dot system method. Every expert was provided with a set numbers of dots that they could use to rank the issues they felt were the highest priority. Dots could be used in any manner including allocating all dots on one issue. The results were as follows:

- 1) A system to ensure the design of effective movement corridors and connectivity (26%)
- 2) Consequences of disruptive natural movement patterns / barrier effects / metapopulation dynamics (25%)
- 3) Recolonization of reclaimed areas (15%)
- 4) The following two were ranked equally (14%)
  - a. Ensure adequate connectivity of protected areas.
  - b. Adaptive management system
- 5) Location and Methodology (study design) (4%)
- 6) Adjacency of mines and river valleys (2%)

## **Workshop Conclusions:**

Using the following criteria:

- A = Moose (seasonal movement)
- B = Black Bear (preference for movements in some habitats)
- C = Wolf (dispersal movements)
- D = Lynx (dispersal movements)
- E = Fisher (home range movements)

- 1 = Radio telemetry - GPS collaring
- 2 = Snow Tracking
- 3 = Snow Backtracking
- 4 = Aerial Survey
- 5 = Remote Cameras
- 6 = Genetics (including scat)
- 7 = Landscape Modeling

## **Effective Movement Corridors and Connectivity – Physical Attributes**

1. A, B, C
2. A-E
3. A, C, D, E
4. B-E

## **Effective Habitat Use of Corridors - Use**

1. A,B,C
2. A, C-E
3. A, C-E
4. A,C?
5. A-E
6. B-E

## **Population Viability (10-30 Yr, 60-100Yr)**

1. A-C
6. B-E
4. A
7. HSI Modeling

Thanks were extended to everyone who was able to attend the workshop. The attached survey was provided to workshop participants for feedback. Only one response was received.

“Ask Sue Hannon at the U of A about birds and connectivity of habitats plus dispersal. It seems we kept getting back to the small scale corridor issue. Conservation groups are concerned also about the large scale issue and the recognition that large corridors that avoid the mineable area can be

established. For this to be possible it is useful to advise government how to identify potential corridors and keep them free of leases”.

**Meeting Adjourned:** 4:00 p.m.