

# **Biodiversity Assessment and Monitoring Research**

## **A Summary Report of Activities – 2014**

**Yukon College**  
**Yukon Research Centre**  
**Box 2799, Whitehorse, Yukon Y1A 5K4**

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These projects mostly use bird species diversity and population performance as indicators of ecosystem health. In part using student energies, data bases are maintained tracking key demographic parameters of important focal species. Some of these now have well over 40 years of data. 2014 was the seventeenth year that this initiative has been based at Yukon College; in part the vision has been to contribute toward Yukon's commitment under the Canadian Biodiversity Strategy (1993)

The Biodiversity Project works with a broad spectrum of community, private and government partners in carrying out its tasks. The following abbreviations refer to: PARTNERS in 2014:

- YC=Yukon College;
- YRC= Yukon Research Centre;
- VGFN= Vuntut Gwitchin First Nation – Old Crow
- KFN= Kluane First Nation
- YTG =Yukon Government, (Department of Environment)
- CWS =Canadian Wildlife Service;
- BC = British Columbia Ministry of Environment
- NYRRC = North Yukon Renewable Resource Council
- YWP = Yukon Wildlife Preserve
- IPY = International Polar Year project
- TGP = True Grid Power, Ontario
- WCBP = World Center for Birds of Prey (Boise, Idaho)
- WMACNS = Wildlife management Advisory Council, N.Slope
- YSI = Yukon Science Institute

YC STUDENT INVOLVEMENT: Field assistance was provided by Graeme Poile, currently a student at the University of Victoria. He was hired through the Yukon Dept of Education STEP program Jesse Vigliotti and Chandelle King used parts of the research to produce research papers as academic credit at Yukon College. A variety of students assisted with the cataloguing of specimens and other aspects of the field work.

## 2014 Projects

The groupings of tasks are those identified at the first year’s public planning workshop held at Yukon College in Whitehorse, March, 1998:

### a) Communication and Public education

The College, with its prime mandate for public education, its school initiatives, its partnerships with the Yukon Science Institute, and its expertise implicit in publishing, is in a powerful position to disseminate public information.

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#### 1. **Public Lectures -- Whitehorse, Dawson** Educational events (10)

A similar effort as in past years: Two talks were given at school events, and one at a Community public event. The partnership extended to events planned and implemented by Yukon’s Department of Environment “Wildlife Viewing Program” A public lecture was given at the Dempster Interpretive Center, and one at the Yukon Beringia center as part of the Yukon Science Institute series.

D.Mossop, N.Barichello  
Support: YTG, YC

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**2. College Course Offerings -- Whitehorse**  
Conservation Biology, and Environmental Education at Yukon College

A similar effort as in past years: Two course offerings, an introductory course in the principles of Conservation Biology, Natural History of the North. Both are updated and supplemented in part through the project, to emphasize the concepts of local biodiversity.

D.Mossop,  
Support: YC

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**3. Yukon Wildlife Preserve partnership Whitehorse**

This initiative began in 2002, it is an attempt to meld the College educational and research mandates with the opportunities offered at the Yukon wildlife Preserve, 10 km West of Whitehorse. The collection of indigenous animals at the preserve offers opportunity in course offerings as well as hands on research experience for students and associates of the College. A Memorandum of Understanding has been signed to give the partnership structure. The College provides meeting rooms and D. Mossop has acted on the board of the non-profit volunteer society that operates the preserve.

Several courses made day trips to the preserve in support of course curriculum.

## b) Field Research and Monitoring

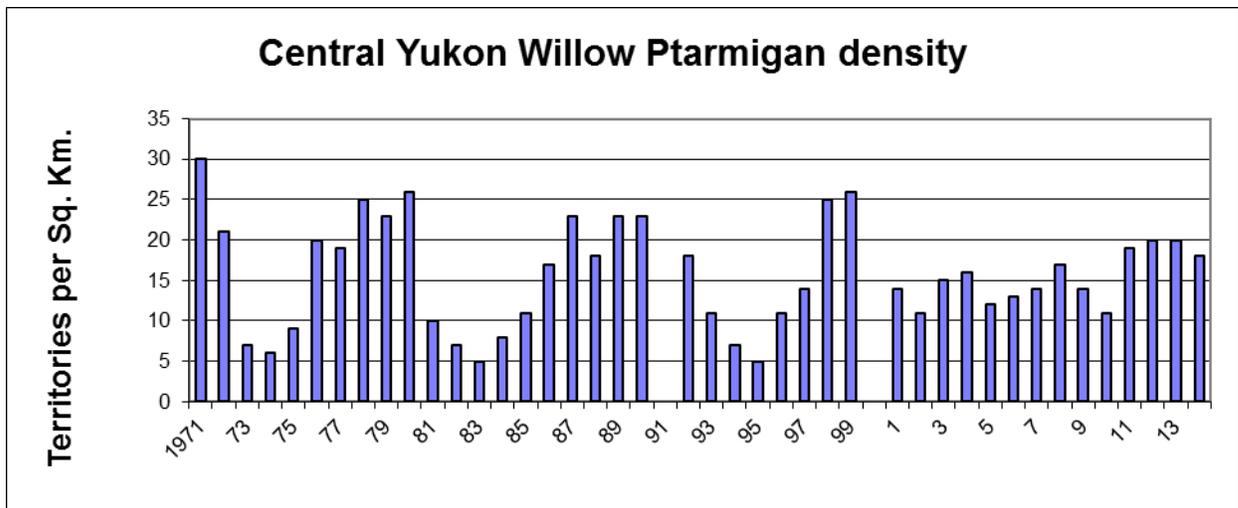
A key element of the project was again biodiversity research, basically tracking the status of key Yukon wildlife species. The Yukon Research Centre administers and coordinates this work. An important objective of College research is to engage communities, Non-government Organizations and local Resource Councils.

### 4. Willow Ptarmigan annual survey --Ogilvie Mtns, Coast Rnge, N.Slope

Two of 5 long-term study plots were searched for territorial pairs: The Chilkat pass plot on the Haines Hwy and The North Fork Pass plot on the Dempster Hwy. The North Slope aerial transects were revisited after a gap of 5 years

**Progress:** Basically, numbers have not changed since 2010-11. This was not expected; the period for the predicted high of the 10 year cycle has passed without it peaking; the populations should now be declining rapidly. The reasons for this potentially troubling finding will form the basis for future analysis. If this apparent change in the 10 year periodicity of this species' population persists it may be signaling one of the most serious disruptions to the Yukon's ecology. Climate change or some other major over-reaching cause is likely.

D. Mossop, G.Poile  
Support: YC, YTG(parks)



## 5. Gyrfalcon annual productivity survey --

## Coast Mtns ecoregion, North slope

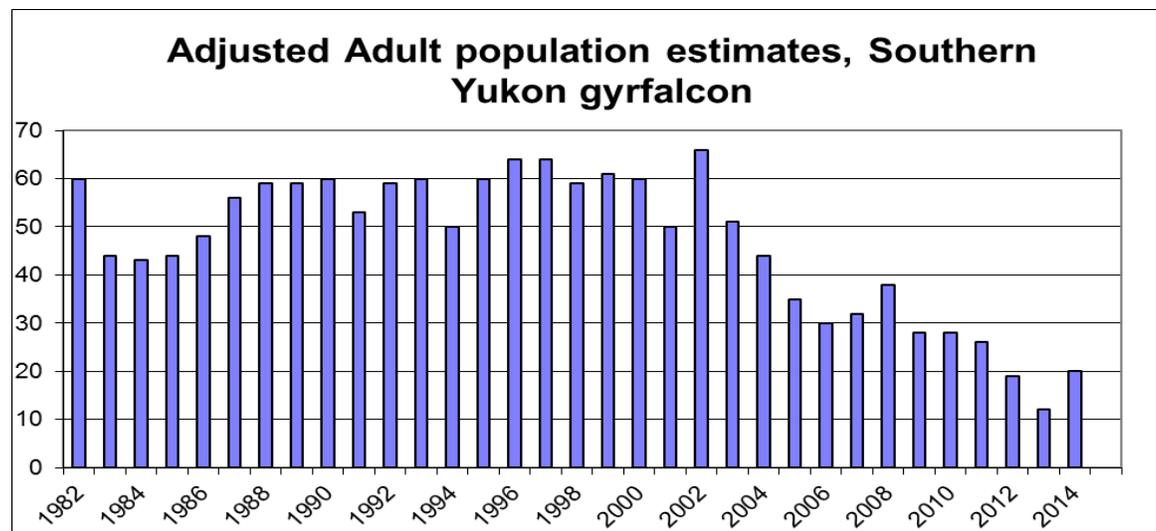
A standard sample of nest sites was visited by helicopter. Occupancy and productivity data were collected. Survey also occurred on the North Slope after a 5-yr hiatus.

**Progress:** Historically, productivity in the Coast Range was high from 1999 through the 2007 survey, In 2008 a significant drop was noted. This accompanied a growing troubling indication that the adult breeding population in this group may be declining. In 2012 and 2013 productivity was basically zero. In 2014 productivity improved somewhat to almost 30% of nest sites checked.

The network of circumpolar gyrfalcon research tracking of the ecological status of tundra habitats has continued. The World Center for Birds of Prey has begun coordinating, funding through the Peregrine Fund.

### Reporting:

- 2011 The overwhelming influence of ptarmigan abundance on gyrfalcon reproductive success in the central Yukon, Canada. In: R.T. Watson, T.J. Cade, M. Fuller, G. Hunt, and E. Potapov (Eds) Gyrfalcons and Ptarmigan in a changing world. The Peregrine Fund publ.
- 2011 Long-term studies of willow ptarmigan and gyrfalcon in the Yukon Territory: a collapsing 10-year cycle and its apparent effect on the top predator. In: R.T. Watson, T.J. Cade, M. Fuller, G. Hunt and E. Potapov (Eds). Gyrfalcon and Ptarmigan in a Changing World. The Peregrine Fund Publ. Boise.



D. Mossop, T. Powell, R. Florkiewicz  
Support: YTG, YC,.

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**6. Waterfowl pair counts -- Nordenskjold wetland**

As in past years, a standard sample of water bodies was visited weekly and surveyed for water birds; five counts were made. Water level gauges track the volume of water in this sample of wetlands as a measure of overall wetland health in the central territory. Data were collated and entered into a database.

**Progress:** The data were pooled with cooperators surveying similar wetlands elsewhere and collated by C.W.S., Whitehorse. Ponds in the study area generally held more water than in recent years.

G.Poile, D.Mossop,  
Support: Y.C., CWS,

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**7. Breeding songbird survey -- Eagle plains, Dempster Hwy**

Two standard breeding bird surveys were carried out along the Dempster Hwy in the Blackstone and Eagle River/Arctic Circle area. All data were collated and submitted to the National Breeding bird survey, Ottawa.

D. Mossop., G.Poile  
Support: YC,

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**8. Peregrine falcon productivity study -- Yukon Wide**

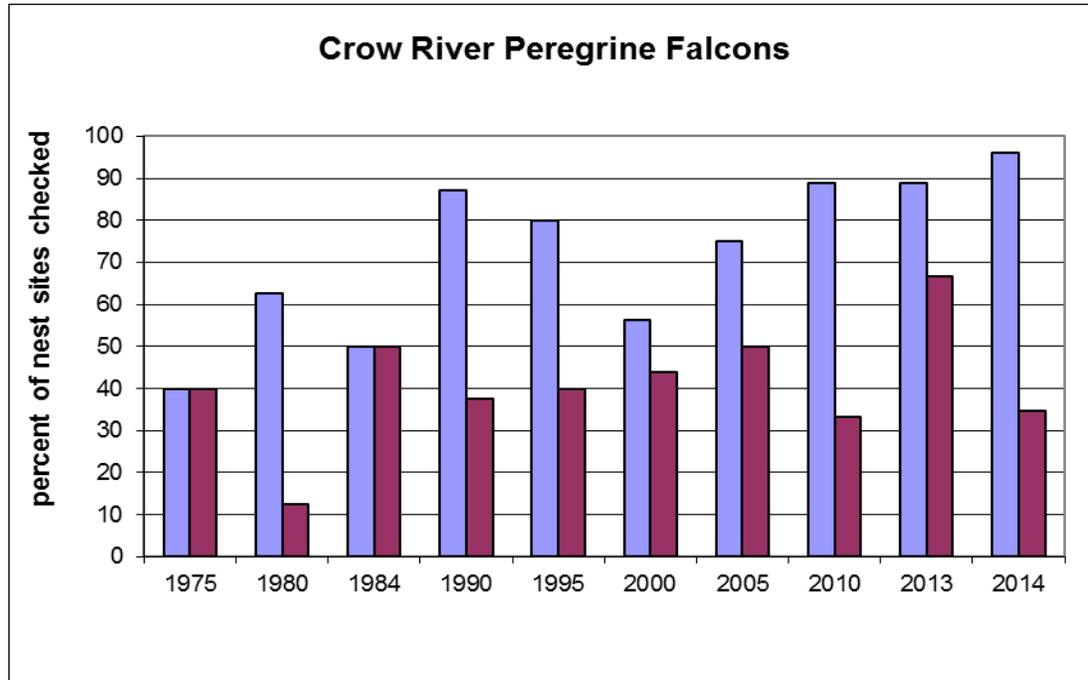
Key reporting for the national peregrine falcon survey occurs every 5 years. In 2010 all 5 sub-populations in the Yukon were surveyed by a variety of mostly volunteer and government personnel. Just under 70% of known pairs were visited (approximately 170 sites visited).

Survey in 2014 covered only the Old Crow River upstream to approximately the mouth of Timber creek.

**Progress:** Production of young again dropped in the breeding pairs surveyed to about 30% of those checked: (This is in contrast to the relatively high productivity observed in the previous year, but more similar to that observed in the last decade.)

**Reporting:**

- 2010. Population status of the peregrine falcon in the Yukon Territory. Northern Res. Inst ms, Yukon College 12 pp + append
- 2011 Prey use and selection in relation to reproduction by peregrine falcons breeding along the Yukon river, Canada. J. Raptor Research 45(1): 27-37. R. D. Dawson sr author



(Light bars are proportion of known nest sites with attending adults, dark bars are proportion of sites producing young)

D. Mossop, Briana Tetlich, A.Frost, G.Poile  
Support: YRC, VGFN

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**9. Environmental Monitoring at the Yukon Wildlife Preserve**

This project was an initiative to establish a suite of data bases that would track the progress of various indicator species at the Yukon Wildlife Preserve near Whitehorse. College students Kawina Robichaud, and Chandelle King have used Northern Research Institute grants to do most of the field work and used the work for credit in a directed studies course at the college.

**Progress:** Eight sets of protocols were carried out, b) a standard 'plant watch' program, c) a bird 'feeder watch'. d) a butterfly monitoring transect, e) a winter track count transect, f) a standardized wildlife sighting protocol, g) Standard frog watch, h) waterfowl counts. In the current year Chandelle advanced the work into a directed research project of nest

parasites in our nest boxes under the direction of YC instructor Dr. K. Aitken, YC.

Chandelle King, D.Mossop, K. Aitken  
Support: YRC(funding), YWP

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## 10. Breeding status of American Kestrel, -- Yukon wide



Breeding numbers of American Kestrel have collapsed alarmingly in the last decade. This project uses artificial cavities to track the status of the species;. The work is part of a larger effort examining the status of American Kestrels across North America.

Boreal Owls and other larger cavity nesters like Bufflehead ducks are also involved with an overall objective to understand these species' interrelationships to 'true old growth'.

**Progress:** In the current year we re-checked 95 nest boxes for use. Kestrel numbers seemed to improve slightly: 5 breeding pairs were found (up from one pair in 2013).

### **Reporting:**

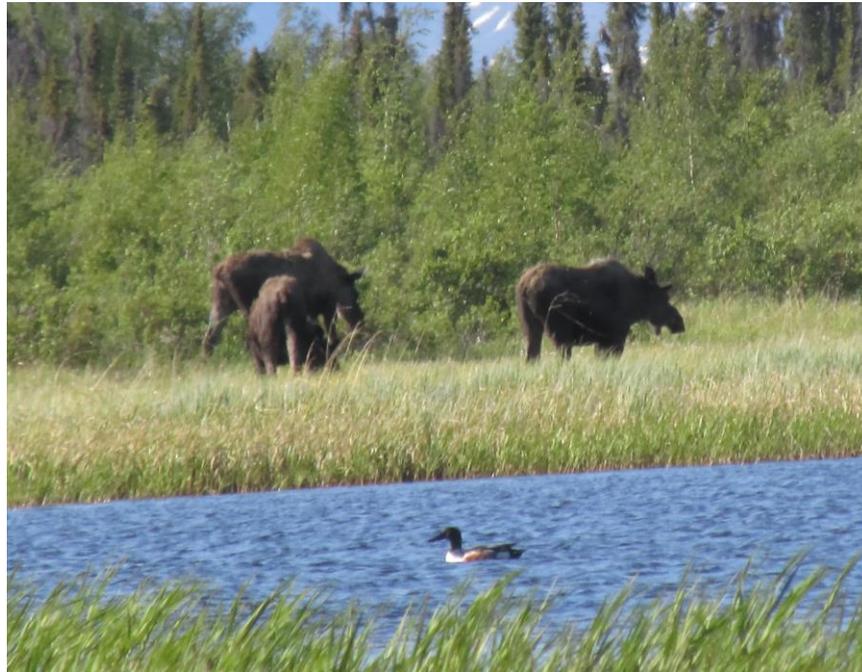
2010. Why are American Kestrels (*Falco sparverius*) declining in N.A.? Evidence from nest box programs." Smallwood ed: 12 authors: Journal of Raptor Research 43(4):274-282. (J.A Smallwood sr. author)

D.Mossop, G.Poile  
Support: WCBP

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### 13. Wetland Assessment: Changes occurring on the Crow Flats

-- OLD CROW



This project is a partnership with the Vuntut Gwitchin First Nation. The objective is to compare similar data sets to those gathered in an earlier study on the Old Crow Flats which used riparian bird species as focal species. Just about 40 years separate the two studies. Nesting chronology and breeding habitat changes are key. Species composition of the breeding birds is being documented. The vision is to gather data in as close as possible to the way it was done in the past. An important component is to involve students from Old Crow in the field work.

**Progress:** An initial community meeting was held late winter 2012; a proposal for the work and funding was produced and submitted by VGFN. Field work was in June and ended in mid July both years. Nine student-aged assistants from Old Crow have been involved directly. Nest search, and brood counts have been the bulk of work. Weather data, plant chronology and species counts are taken. The project is planned as an on-going effort.

**Reporting:** Preliminary analysis suggests that water birds and song birds are breeding about 10 days earlier; shorebirds appear to be unchanged. Habitat changes are apparent:-- water levels in lakes of the central flats appear significantly higher than historic and there is some evidence that the thermokarst and other dynamics of the area may be accelerating.

2013. The Changing ecology of the crow flats wetland: the birds are telling us things.  
VGFN and YRC ms. 22pp

D. Mossop, Megan Williams,  
D.Josie, W.Netro, A.Frost, Briana Tetlich, G.Poile  
Support: VGFN, YRC, TGP, Yukon Fish and Wildlife Habitat Enhancement Fund

### **c) Specimen Data collections:**

#### **14. Bird specimen data base --**

**Whitehorse**

Taxonomic measurement of bird specimens submitted by the public to the Yukon Department of Environment Laboratory were again collected. The data base now contains over 3,000 entries,

In 2011 the new research laboratory was completed at Yukon College and in 2012 it began to be developed as the permanent home for the Yukon natural history specimen collections.

D.Mossop and various Yukon College students

### **d) Cooperative Management Planning**

The Yukon College Biodiversity Project continued a series of tasks in the current year that involved more direct interpretation of existing data bases.

#### **15. Gyrfalcon conservation population integrity and harvest**

**Coast Mountains, Whitehorse**

In 1997, this project produced an analysis of 15 years of productivity data of the gyrfalcons breeding in the Coastal Mountains south of Whitehorse and straddling the B.C. border. The harvest of young birds from this population is allowed annually principally by B.C. Sustainability of the harvest was subjected to basic modeling analysis. The suggestion was that the then harvest was probably not sustainable. In 2001 a consultant's report discussed various options for determining how to better manage the harvest of Gyrfalcons from the population. A strategy for assessing and protecting gyrfalcons at the population level was suggested (currently the harvest is basically from an unknown source). Annual harvest was to be set according to an annual survey. In 2004 a project partnership with BC Environment and YTG Environment was struck and funded principally through a grant from the B.C. government. More intensive monitoring,

banding of young and DNA sampling is involved. Blood samples are being analyzed for DNA markers and isotope concentration to begin a larger data base of gyrfalcon population identity throughout the Pacific Northwest. As part of this study gyrfalcons have also been monitored on the Chilkat Pass during the fall.

The 2014 gyrfalcon harvest limit suggested by our work was: one passage juvenile.

### **Reporting:**

1997. Gyrfalcon population monitoring and harvest in the BC/Yukon Coast Mountain ecoregion. N.Res. Inst, Yukon College ms

2008. Bird of Prey Migration Monitoring Station – Chilkat Pass. N..Res Inst ms  
Yukon College

D. Mossop, T. Powell  
Support: YC, YTG,

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## **16. Ecological monitoring for Yukon parks: Aga Mene and Kusawa park planning areas**

This work builds on basic inventory data bases tracking the status of common loons, large cliff and tree nesting birds of prey and smaller hole-nesting birds. As top predators raptors are powerful indicators of ecological integrity, loons are known as key indicators of lake ecosystem health. Survey of the planning areas for Aga Mene and Kusawa Parks was completed, data analyzed and a protocol for future monitoring was developed.

In the 2013 field season, YC student J.Vigliotti assumed the role of expanding and completing a set of field monitoring protocols for the Age Mene park area. a) Monitoring of an inventory of nesting common loons b) visiting a set of 20 nesting boxes to track the population of tree and violet green swallows and c) monitoring the occupancy and productivity of an inventory of bald eagle and osprey nest sites. Other protocols addressing winter track counts and breeding song birds were added this year

**Progress:** A good sample of breeding pairs of key species is now in the data base on which to carry out future monitoring. Kusawa park is

primarily alpine, the key species are gyrfalcon and golden eagle. Aga Mene is primarily riparian, key species are Bald eagle and osprey. An extremely dense population of common loons has been identified in the latter park that will make a very powerful indicator to track in the future.

**Reporting:**

- 2010. Inventory of bald eagle and Osprey nest sites, Aga Mene Park, Southern Lakes, Yukon. Northern Res. Inst ms, Yukon College 8 pp
- 2010. Raptor populations of the Kusawa Park, Yukon-Stikine ecoregion, Yukon Northern Res. Inst ms, Yukon College, 10 pp 2012.
- 2011 (Jesse Vigliotti sr author). Ecological monitoring protocols for the management of Agay Mene Territorial Park. Yukon College Ms. A report to Env. Yukon Parks.
- 2013 Agay Mene Territorial Park nest occupancy survey report. A report of Environment Yukon, Parks

J. Vigliotti , D. Mossop, K. Aitken  
YC, YTG parks

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**17. Bird strike potential at a planned wind turbine site: Burwash, Yukon**

This study, an initiative of the Kluane First Nation, is designed to track the movements of migrating birds along the shoreline of Kluane Lake where a series of wind turbines are planned. A data-gathering meteorological tower is at the site. Direct observations are being made of bird movements, counts of birds generally using the area are made and searches for evidence of birds hitting structures are conducted.

**Progress:** A large movement of migrating birds both fall and spring has been documented. Their preferred route transiting the site has been suggested. Adjustments to the planning of the site are underway

**Reporting:** .

- 2012. Reconnaissance of bird strike potential at Wind Farm – Burwash Landing, YT
- 2013. (Fall, 2013) Analysis of Bird Strike potential at Wind Farm – Burwash Landing, YT

D. Mossop, J.Vigliotti, G.Poile  
KFN, JP Pinard, PEng,

#### **e) Steering/working Group and annual forum**

In the current year the Working Group met less regularly with new guidelines and an expanded membership. Scott Gilbert and D. Mossop of the Yukon College staff with organizational assistance provided by the Yukon Research Centre continued the responsibility of organizing and providing secretariat for the group. YC former and returning student Shannon Harvey provided that function.

One of the most important parts to the project, is an annual public forum of biodiversity related current field research organized at the College. The event was held in November. Publication of abstracts from the forum and a listing of projects generally addressing biodiversity research in the Yukon continued.

**(<http://www.yukoncollege.yk.ca/research/project/forum>)**