Newsletter

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Contents **Page**

From the Chair

What's happening in the *Martes* world?

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I am a *Martes* enthusiast. People who know me personally know that I love to talk about martens and fishers, and not surprisingly, when we meet, they ask me about *Martes*. I always have something to say, and sometimes I refer people to the web for more information. *Martes* is much more than you think. For some, MARTES stands for "*Model-based Approach to Real-Time Embedded Systems development*" – its aim*: the definition, construction, experimentation, validation and deployment of a new model-based methodology and an interoperable toolset for Real-Time Embedded Systems development, and the application of these concepts to create a development and validation platform for the domain of data stream dominant applications on embedded heterogeneous platform architectures.* This is not us. If *marten* is used as the main query, you will learn about *Dr. Martens* shoes, *The Martens Society* dedicated to a famous Estonian lawyer, and *Martens & Associates* who promote *Martenology – an evolution of intelligence creating an advanced body of practices, procedures and rules with continuous flexibility that adjusts to circumstances and creates an environment of perpetual success*. This is not us either, although some of the Martenology definition may apply to our group! If *fisher* is used as the query, then you will learn about a modern-rock duo, a lab equipment supplier, and a multitude of consulting firms, some associated with pulp and paper. Of course, the *Martes* query leads to our Working Group. But let's not be too specific. The query "*Martes in Africa"* leads to the description of the giraffe – unbelievable! So, if someone wants to know more about *Martes*, let's direct them to the proper website, and provide them with a copy of our Newsletter.

So what's new with *Martes*? Well, our membership is stable – about 100 members. We have a committee working on the upcoming workshop, which will be held in summer 2009 in western United States (see article by Chairman Keith Aubry). The Committee is suggesting inviting wolverine scientists to our symposium for a common meeting where we would share findings and thoughts. We need to know how our membership feels about this initiative – so do not hesitate to contact Keith or myself to express your opinion. Also, the Proceedings of the 2004 Symposium held in Portugal will be in print this fall – consult the ad inserted in this newsletter. The production of these proceedings is truly a labor of love, and the editing committee (Margarida Santos-Reis, Johnny Birks, Erin O'Doherty and myself) spent long hours reviewing papers, exchanging with referees and authors, and selecting and editing final versions to provide you with a significant scientific publication. I thank them all for their commitment to *Martes* biology and conservation.

As you discover *Martes* and its Working Group, you soon realize that our group consists of a few scientists around the world with an ongoing dedication to the study and conservation of martens, fishers, and zibelines. In the *Martes* Proceedings of the 2000 Symposium held in Corner Brook, Newfoundland, future research needs were identified (Proulx et al. 2004). It was recommended that more data on the distribution of the pine marten and the yellow-throated marten be gathered, that *Martes* baseline habitat requirements be identified and habitat management programs be produced, that work be carried out on the effects of global warming on the distribution of species, and that effective monitoring programs and inventory techniques be developed. The upcoming proceedings (Santos-Reis et al. 2006) address many of these recommendations. These proceedings and other scientific publications (see Recent *Martes* Literature) have filled many gaps. Step by step, we all work toward the development of better conservation programs for *Martes* species – this is something that we must be proud of.

So, there is lots to talk about *Martes* – we must just make sure that we properly distribute the information about our group and its publications. I invite you all to make a special effort to publicize the release of the 2004 proceedings – share the Newsletter with your colleagues and contact the professional associations to whom you belong. Oh yes, don't forget to tell people that *Martes* is absent from Africa and does not include the giraffe as one of its members!

Proulx, G., K. B. Aubry, J. Birks, S. W. Buskirk, C. Fortin, H. C. Frost, W. B. Krohn, L. Mayo, V. Monakhov, D. Payer, M. Saeki, M. Santos-Reis, R. Weir, and W. J. Zielinski. 2004. World distribution and status of the genus *Martes* in 2000. Pages 21-76 *in* D. J. Harrison, A. K. Fuller, and G. Proulx, editors, Martens and fisher (*Martes*) in human-altered landscapes: an international perspective. Springer Science+Business Media, New York, New York, USA.

Santos-Reis, M., J.D.S. Birks, E.C. O'Doherty, and G. Proulx. Editors. 2006. *Martes* in carnivore communities. Alpha Wildlife Publications, Sherwood Park, Alberta, Canada: *in press*.

Martes Working Group Steering Committee, 2004 - 2009

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Martes Working Group Online

For information on our activities and members, check our website at http://www.laurentian.ca/martes/

CANADA

Ecology of fishers in the boreal mixedwood forests of northeastern British Columbia

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Fishers (*Martes pennanti*) are medium-sized members of the Mustelid (weasel) family that occur in the lowland forested areas of central and northeastern British Columbia. Research in other areas of BC have shown that forest harvesting that focuses on late-successional forests may have detrimental effects on fisher populations. However, gaps in the knowledge of the habitat relationships of fishers in the Peace region hamper the ability of forest licensees to adequately manage for fisher habitat. This project will address these knowledge gaps through inventory and research of fishers in the Kiskatinaw Plateau ecosection and will further support sustainable fisher populations in the Peace River Region.

To estimate the density of fishers in this region, we completed 4 hair-snagging sessions at 46-7x7 km grid cells throughout the Kiskatinaw Plateau ecosection between 22 January and 26 April 2006. We collected 217 hair samples (glue pad hits) at 56 sites within 35 (of 46) grid cells. The average duration that each site was operational was 28.7 nights (range 12 - 46, SD = 7.8, n = 137 sampling intervals). We had more sites hit during March (29 sites) than Feb (14 sites) or Jan (11 sites). Samples are currently being analysed by a commercial genetics laboratory and mark-recapture estimation of population size will be conducted once this analysis has been conducted.

We also radiotagged and monitored fishers within the research project area to examine the habitat relationships of fishers in the Boreal White and Black Spruce biogeoclimatic zone. Between February and March 2005 and 2006, we had live traps set at 67 sites for 1067 trap-nights to capture and radio-tag fishers within the research project area. We captured and radio-tagged 7 fishers (4M, 3F) during 2005 and 3 new fishers (1M, 2F) during 2006. We collected 166 radiolocations between 5 March 2005 and 1 August 2006, of which 161 were suitably precise for inclusion in habitat and home range analyses. Unfortunately, relatively little data was collected for 5 of the 7 fishers that were tagged in 2005, either because of transmitter malfunction or disappearance of the animals between May and December 2005.

We documented fishers using several different types of structures for rearing offspring or resting. We identified 4 females using 5 natal and 5 maternal dens during the 2 rearing seasons. All natal and maternal dens occurred in cavities in relatively large, declining balsam poplar or trembling aspen trees, which were somewhat typical of dens reported for fishers elsewhere in British Columbia. We also identified fishers resting in cavities in these 2 tree species. Other rest sites included within willow clumps, on a rust broom in a black spruce, magpie stick-nests, and under an abandoned mobile home.

Future work planned for 2006-08 includes habitat evaluations, developing habitat conservation guidelines, identifying candidate Wildlife Habitat Areas, publishing peer-reviewed scientific reports, and extension of the results of this work to forest licensees, trappers, and the oil and gas industry.

UNITED STATES

When reintroductions are augmentations: The genetic legacy of fishers (*Martes pennanti*) in Montana

(Abstract from article published in Journal of Wildlife Management)

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Fishers (Martes pennanti) were purportedly extirpated from Montana by 1930 and extant populations are assumed to be descended from translocated fishers. To determine the lineage of fisher populations, we sequenced 2 regions of the mitochondrial DNA genome from 207 tissue samples from British Columbia, Minnesota, Wisconsin, and Montana. In northwestern Montana, fishers share haplotypes with samples from the upper Midwest and British Columbia; in west-central Montana, we detected haplotypes found in British Columbia samples, but also detected a control region and cytochrome-b haplotype not found in source populations. Based on the unique haplotypes found in west-central Montana, we propose that individuals with these haplotypes are descended from a relic population. Fishers in northwestern Montana are likely descended from fishers from the Midwest and British Columbia.

Old Nest Used as Marten Rest Site

Photo by Chris Schumacher, Wildlife Biologist, Manistee Ranger Station, Manistee, MI, cmschumacher@fs.fed.us

The above photograph is of a marten using an old hawk or corvid nest for resting in Michigan, USA. This seems to be a frequent occurrence in Michigan. Contact Chris if you have noted similar use.

White Coloration in *Martes Americana* in Alaska

Photos taken by Jack Whitman, Wildlife Biologist, Alaska Department of Fish and Game

The above photographs are of Martes americana captures in Alaska. Note the unusual amount of white coloration.

Demographic rates and denning ecology of female Pacific fishers (*Martes pennanti*) in northwestern California

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The Hoopa Valley Tribe and the Wildlife Conservation Society are collaborating on a study of the Pacific fisher (*Martes pennanti*), an animal which is culturally important, a species of special concern in California, and a candidate for federal listing. Primary goals of the project are to investigate demographic rates and denning ecology of female fisher on the Hoopa Valley Indian Reservation in northern California. These data are preliminary and will be presented in the literature upon completion of the study.

Data collected from live trapping between 2004 and 2006 demonstrated a 54% decline in capture success and a change in the sex ratio (from 1 male: 2.6 females to 1 male: 1 female) of fisher on the reservation compared to similar efforts conducted between 1996 and 1998. In conjunction with the trapping effort, we captured, marked, and tracked 21 subadult and adult female fishers. Non-juvenile, female annual survival (1 January 2005 -1 January 2006) of 18 fishers was 72.2%.

Denning behavior was observed, on average during 2005 and 2006, between 22 March and 26 May. Of the females monitored during both years, 85% exhibited denning behavior and 68% succeeded in weaning at least 1 kit. Female fishers used a mean of 3.1 dens per den season (range 2-6 dens) concentrated within a limited area of their home range. Fifteen natal-parturition dens, 30 natal-pre-weaning dens, and 2 maternal dens were identified during the two years in large (mean dbh 104 cm) live trees and snags in conifers and hardwoods. Thirteen male and 13 female kits were observed in 14 dens investigated in 2005 and 2006. Three juveniles from the 2005 season were radio-collared last fall and tracked in an initial investigation on dispersal. With additional funding, we hope to continue efforts to learn about fisher dispersal this fall by capturing and tracking juveniles from dens found in the spring of 2006.

Results from this project have led to concern for the long-term viability of fisher on the reservation and the need for long-term population monitoring efforts. However, this study will also assist Hoopa forest managers to make more informed management decisions during timber extraction activities in working toward the conservation of structures used for denning by Pacific fisher on the Hoopa Valley Indian Reservation.

Photo 1 below is of a male fisher kit (approximately 10 weeks old) extracted temporarily from a den in the cavity of a large Douglas-fir tree shown (photo 2). Photo 3 shows two male kits extracted by S. Matthews from their maternal den in a port-orford cedar (photo 4). Photo 5 shows a kit after return to its maternal den in a tan oak cavity. Each kit received a PIT tag which will allow us to identify them in the fall when they are large enough to be fitted with a radio-collar and tracked to help us learn more about dispersal. Photo credits to Hoopa Tribal Forestry.

Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

RUSSIA

The problems facing sable *Martes zibellina* management in Russia

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In December 2005, the Internet-conference for researchers of sable ecology in Russia was organized. The organizers of conference were the All-Russia Institute of Hunting and Fur-Farming (VNIIOZ), Sable Commission of RAS, Russian Fur-Trade Union and the company "Sojuzpushnina".

The purpose of the conference was to discuss the current conditions of sable resources in regions of Siberia, to coordinate scientific research, and define strategies for harvesting sable populations.

The authors' articles (more than 40) have been placed on the official web site www.russian-sable.narod.ru. In May 2006 the proceedings of the lead conference were published: "Problems of sable management in Russia. V.G.Safonov, editor. Kirov: VNIIOZ, 2006. 284 pp."

Difficulties of aging sables *Martes zibellina*

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Age composition is one of the most variable characteristics of any population (Odum 1986). It is currently considered to be one of the ways in which populations adapt themselves to a changing environment. At the same time, the age structure is one of the least studied population characteristics, especially for game or fur-bearing animals, because methods for relatively precise age determinations have not been worked out until recently (e.g. Smirnov 1960, Klevezal and Kleinenberg 1967).

I studied the age structure of sable populations in the northern Sub-Urals (n = 2150) during the period of 1978-1990, and in the basin of the River Kizir (the western Sayan, n = 1765) during the period of 1977-1982. Age of the animals was based on counts of cement layers of the canine teeth (Klevezal and Kleinenberg 1967). Microscope preparations of the upper (mandibular) canine tooth included 10-16 dyed longitudinal sections. Not all cross-sections could be read along their whole length. The main difficulty was in determining the age of animals >1 year old. In some cases, the first annual layer in the canine cement was particularly indistinct, or not visible along the whole length (Grakov 1981, Monakhov 1984, 2004, Klevezal 1988). Such animals could therefore sometimes be aged as juveniles.

Readability of annual layers in canine cement can vary depending on the quality of preliminary procedures and dyeing techniques, as well as on the equipment used (e.g. microscope, lighting). Sufficient experience, training, and participation of senior colleagues are necessary for successful determination of sable age. It is also desirable to have reference preparations of animals of known age. This investigation is supported by RFBR (Project 04-04-96006) and the Ural and Siberian divisions of RAS.

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Nonmetric skull divergence between autochthonous and acclimatized populations of the sable, *Martes zibellina*

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The introduction of sables from the Baikal Region in the mid-1900s was one way to restore the species after overharvesting. We analyzed the epigenetic changes in acclimatized sable populations from Ob and Yakutian, and from the Baikal Region. Also, cranio-logical samples from Ob, Yakutia and Baikal autochthonous populations were included in analyses. For the evaluation of epigenetic differentiation 23 nonmetric skulls traits were used and "mean measure of divergence" (MMD) proposed and derived by Sjovold (1977) was calculated.

The epigenetic population distances for sable range from 0,001 to 0,210. Highest MMD-levels were observed between Ob and Baikal autochthonous sables. High values of the epigenetic distances were found for one acclimatized population and autochthonous from Ob Region. Other acclimatized populations from the Ob Region were more similar to Ob autochthonous in epigenetic variation of skulls. Acclimatizants from Yakutia were situated between Yakutian autochthonous and Baikal sables. So, acclimatized populations of the sable differed from the autochthonous populations with the same habitats by development of the epigenetic characters of skull. However divergence between acclimatizants and populations from Baikal Region, which had common ancestors, was significant too.

The earlier studies (Monakhov, 1999, 2000) demonstrated that acclimatized populations of the sables had lighter fur colour and bigger skulls sizes than Baikal sables. The results of our research of the epigenetic variability also demonstrate that introduced animals developed into new populations of sables with specific morphological characters that were different from both: autochthonous populations from the same habitats and Baikal sables of the same origin.

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Cub captured at den to take hair sample

Observation of the same cubs growing at den

Juvenile at adult size trapped to be collared

Pine Marten followed while dispersing

FRANCE

Study of a pine marten population in a fragmented landscape

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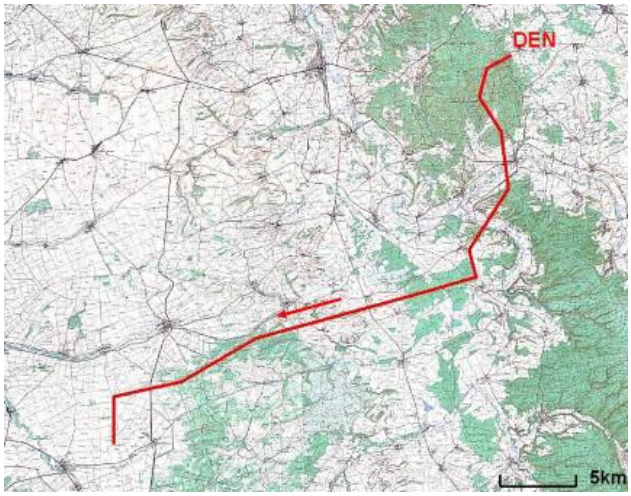
Since January 2005, we are working on the impact of landscape fragmentation on pine martens (*Martes martes*, Linneaus 1758) populations in the Ardennes, in north east of France. We want to check whether this phenomenon affects these populations by reducing genetic variability or if the individuals modify their space use pattern after landscape transfers. In order to deal with it, two approaches are carried out, habitat selection analysis and population genetics.

Pine martens were trapped in a fragmented agricultural landscape and radio-collared. Hair samples were caught on them and on animals killed by traffic or trappers. Home ranges were estimated from telemetry data. We determined genetic structure and variability and compare our pine martens population to two others situated in the east of France.



A 50 km-dispersion path of a pine marten female from its den site

MARTES in CARNIVORE COMMUNITIES

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Margarida Santos-Reis, Johnny D. Birks, Erin O'Doherty, and Gilbert

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Next *Martes* Symposium Planned for 2009

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Planning is underway to convene the 5th International *Martes* Symposium at the University of Washington in Seattle during the summer of 2009. The planning committee consists of Keith Aubry (chair), Bill Zielinski, Marty Raphael, and Steve Buskirk. As with previous gatherings, we plan to publish the proceedings. However, rather than select a focused topic for the meeting, we think the time has come to update the review papers that characterized the proceedings of the 1st *Martes* Symposium volume in 1994, and helped make it such a valuable reference. Technical papers from individual studies would also be welcome, but we hope to devote much of the meeting and the proceedings to defining the current state of knowledge and identifying the most fruitful areas for future research. By the summer of 2009, we anticipate that fishers will have been reintroduced to the Olympic Peninsula in Washington, which would provide an excellent opportunity for field trips.

We have also initiated discussions with a group of *Gulo* (wolverine) biologists about the possibility of making this a joint symposium on *Martes* and *Gulo*. An international group of wolverine biologists convened their first symposium during the summer of 2005 in Jokkmokk, Sweden, with 150 people attending; their next gathering is tentatively planned to be located somewhere in the Pacific Northwest. Thus, both the timing and the location of their next meeting fits well with current plans for the 2009 *Martes* Symposium. Not only would this provide an opportunity for comparative assessments of *Martes* and *Gulo* biology, ecology, and conservation, but there is considerable taxonomic support for holding a joint meeting of *Martes* and *Gulo* biologists. Recent studies have shown that these two genera are paraphyletic, and that wolverines are more closely related to fishers, American martens, and yellow-throated martens than previously believed (Stone and Cook 2002, Flynn et al. 2005). Thus, we may also want to consider using the 2009 meeting to discuss the possibility of combining *Martes* and *Gulo* into a single Working Group.

If you would like to help with the planning and implementation of the next *Martes* symposium, please contact Keith Aubry by e-mail (kaubry@fs.fed.us) and let him know what aspects of the meeting you would like to participate in (e.g., meeting logistics, scientific program, field trips, reviewing abstracts, editing the proceedings, etc.). Also, if you have an opinion about (1) what review topics on *Martes* would be most useful to address in the next proceedings, (2) whether we should convene a joint meeting with wolverine biologists in 2009, (3) if so, whether technical or review papers on *Gulo* should be included in the proceedings, or (4) whether we should discuss the possibility of combining ourselves into a single group at the 2009 meeting, please contact Keith Aubry and Gilbert Proulx by e-mail (gproulx@alphawildlife.ca) and let us know what you think.

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Recent *Martes* Literature

See previous issues for additional literature.

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One additional photo from the Hoopa study.
Kit after processing, returning to den.

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