Newsletter

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From the Chair

Let's help *Martes* populations hit by natural disasters

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On December 26, 2004, the world's most powerful earthquake in more than 40 years struck deep under the Indian Ocean triggering a massive tsunami that obliterated cities and seaside communities. In 2005, Bulgaria experienced its worst floods in 30 years, which inundated thousands of homes and 94,000 ha of farmlands. Similar floods hit Romania and Tajikistan. After weeks of drought and heat, Portugal was hit hard by forest fires that destroyed an area exceeding 200,000 ha. In western Canada and United States, extensive fires destroyed many communities. These natural disasters have claimed the lives of thousands of people, and have destroyed homes and dreams. Needless to say, our heart goes out to these people. Of course, media coverage focuses on people and their lives, and little is being said about wildlife that also suffered from extreme environmental conditions. I wonder about wildlife communities and habitats impacted by these disasters. What happened to yellow-throated martens inhabiting Indonesian forests that have been leveled by the tsunami? What happened to stone martens inhabiting Eastern Europe farmlands? What is the impact of forest fires on the survival of the scarce pine marten in Portugal? In western North America, where forests are already fragmented by extensive timber harvesting and insect epidemics, how many marten and fisher habitats burned overnight?

Such extreme events force us to wonder about our capability as *Martes* scientists to develop recovery programs for marten and fisher populations that have also lost their habitats overnight. Do we know enough about species inhabiting countries hit by the tsunami to focus on key populations that could be used to repopulate devastated areas? With today's extreme weather events, have we thought about emergency responses to save *Martes* populations?

I know, some people will think that martens and fishers should not be of great concern when human lives are at stake. And I agree. However, in the aftermath, where are we as wildlife professionals? What can we do as *Martes* specialists? What can the MWG do? This is an opportunity for all of us to implement what we know, to truly contribute to *Martes* conservation. I believe that there is a need to develop the *Martes* Working Group into a true international resource group, which can provide support to governmental agencies. I am afraid that freak storms and endless droughts are part of our future. Let's not remain complacent and only work on "safe" projects. Let's become involved in the conservation of *Martes* populations whose survival is challenged by sudden habitat loss.

We are in the process of publishing the Proceedings of the symposium held last year in Portugal. The Editorial Committee has selected a series of very interesting papers that will provide conservationists and wildlife managers with valuable tools to investigate populations' distribution and densities, help relocate individuals, and predict the suitability of habitats. This in itself is a step in the right direction to help wildlife agencies dealing with the conservation of *Martes* species in ravaged areas. We were hoping to release the Proceedings this summer. However, because we are still waiting for some editorial changes from a few authors, the publication of the 4th International Proceedings will be postponed until later this year, or early 2006.

Martes Working Group Steering Committee, 2004 - 2008

Chair	**Gilbert Proulx**
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Membership Report

The *Martes* Working Group currently has 136 members from 17 different countries.

Martes Working Group Online

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

CANADA

British Columbia fisher (*Martes pennanti*) population review

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Fisher populations in British Columbia were the subject of a two-day population science workshop (October 13-14, 2004) hosted by the BC Ministry of Environment, to examine in detail all available data pertinent to the development of provincial fisher population estimates. The workshop was attended by ministry biologists, private consultants, members of the BC Trappers Association and was moderated by Dr. Alton Harestad of Simon Fraser University.

Fisher harvests in British Columbia have declined over the past three decades (Figure 1). BC changed its harvest reporting system in 1985 to one that captures traplines specific harvest data from fur traders. This system appears to be more efficient and complete than using data from the fur auction houses (Figure 1).

Habitat ratings for a number of areas in BC were modified from those presented in Weir (2003) on the basis of new work by Davis, harvest data and the experience of trappers in specific locales. These ratings resulted in a revised habitat ratings map for fisher (Figure 2). A revised fisher distribution is included below on the fisher habitat capability map (Figure 2). The revised distribution is based on discussions during the workshop, evaluation of the East Kootenay Fisher Transplant Program, and evaluation of harvest data fro 1985-2003. Fishers are distributed over approximately 417,681 km^2 in British Columbia. Fisher populations appear not to occur in approximately 125,632 km^2 of potential habitat within their historic range in the southern portions of the province.

Consultants Richard Weir and Larry Davis presented population density estimates for two study areas in British Columbia that helped refine baseline densities associated with habitat mapping. Revised fisher population estimates were calculated for British Columbia based on relationships between habitat ratings and fisher density. The estimated range of the provincial population if the Williston Lake study area (Weir and Corbould *in submission*) habitat ratings are on the low end of the ratings ranges relative to the provincial benchmark is 2236-3715. The estimated range of the population if the Williston study area habitat ratings are on the high end of the ratings ranges relative to the provincial benchmark is 1403-2331 fishers. The workshop results acknowledged that the revised provincial estimates are highly dependent on density estimates from the Williston study. However, the preliminary density estimate for the Chilcotin pilot study by Davis was consistent with the corresponding habitat rating and associated density range for higher population estimate range above.

As a result of the population review, the BC Conservation Data Centre (CDC) re-evaluated fisher status in

Figure1. Annual harvest of fishers in British Columbia (1919 -2002).

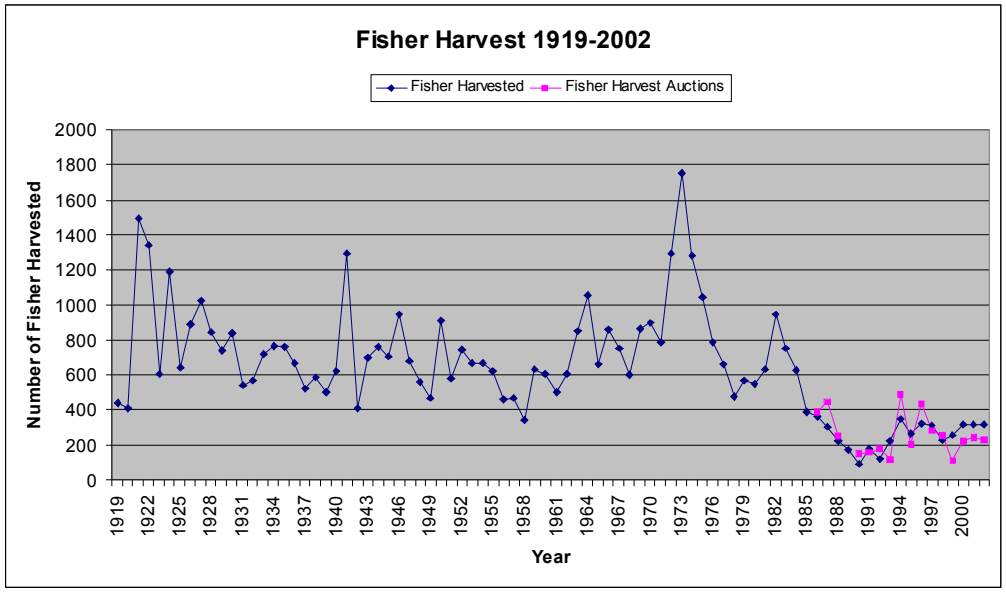
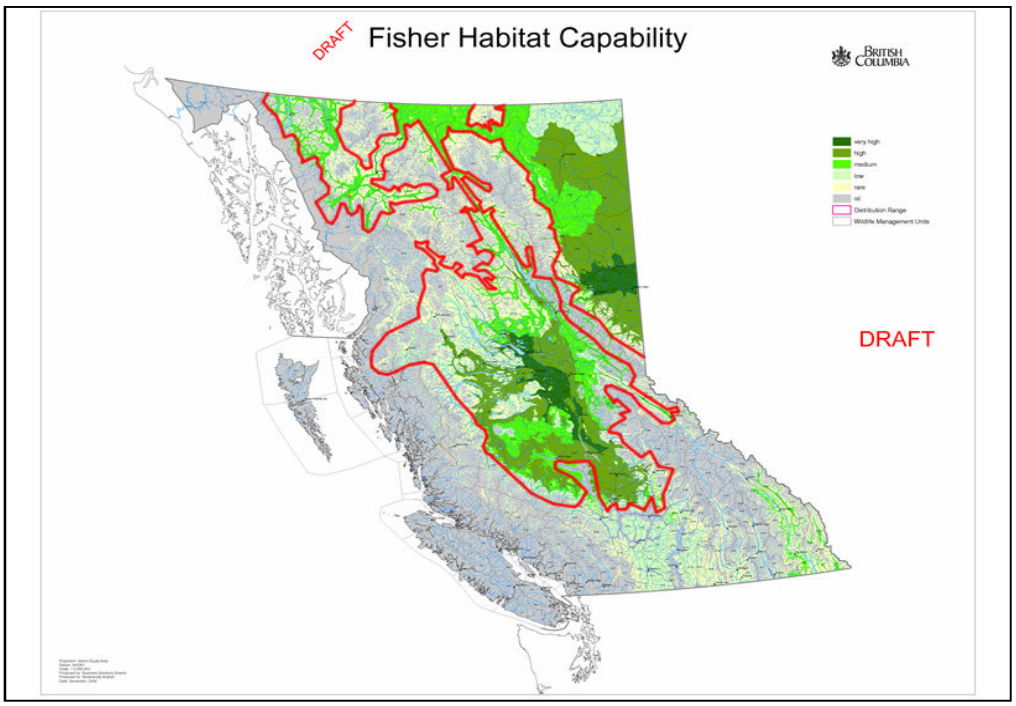


Figure 2. Fisher habitat capability and current distribution in British Columbia



British Columbia. This resulted in the species' status being changed from S2S3 to S2 and consequently being moved from the provincial Red-list to the Blue-list. As a result, fisher trapping seasons have been re-opened for 2005/06 in management units that are likely (based on habitat capability and current harvest data) to have a fisher population of sufficient size to sustain a harvest.

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RUSSIA

Martes current conditions in the Mid-Ural zone of sympatry

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The area of overlap between two *Martes* species near the Ural Mountains has been documented (e.g. Proulx et al. 2004). Particular attention should be paid to current conditions of pine marten and sable populations in this sympatric zone. Here, we investigated numerical parities of two *Martes* species in Mid-Urals based on snow track accounts of 1991-2004 (study was supported by RFBR, project no. 04-04-96006). In the six north-east districts of the Sverdlovsk region, both species live in sympatry. In that zone the annual average spring number of sables is 3023 and 990 for pine martens. Most likely, the sables in such areas gradually exclude martens from the habitat.

The numerical prevalence of sable over pine marten abundance in the area of joint dwelling was also noted in the Perm region by Trenichev and Kuprin (1985). It is interesting that between 1950-1960 Bakejev and Bakejev (1970) noted a higher prevalence of marten over sable in these areas.

The northeast forests are more suitable for sables, but the pine martens exhibit the greatest densities in southwest districts of the Mid-Transurals. The border between areas of the two species is impossible to draw as a line because there are vast territories of joint dwelling. It can be presented only as a dividing zone (a corridor of 50-150 km in width) stretching from northwest to southeast along the Sosva, Tavda, and Lozva to the confluence of the Tobol and Irtysh rivers. The total wooded area where sables live in sympatry with pine martens in the Sverdlovsk region is nearly 65,000 km^2. The geo-

graphical location of this zone vary little, however significant changes could occur here as a result of changes in climate, habitat alteration, or harvest pressure.

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UNITED STATES

Marten research and management report – New York State

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During the past 2 years we have initiated several projects investigating the ecology and management of American marten in the Adirondack mountain region of northern New York State.

Harvest Monitoring

We recently completed an analysis of 602 teeth from harvested marten taken between 1992 and 2004; this sample represented 57% of the total harvest during this time period. We are in the process of evaluating harvest ratios (e.g., M:F, J:A, J:AF) and preliminary results suggest that the Adirondack marten population is lightly harvested. We will continue to closely monitor and regulate the marten harvest in New York, due to the limited distribution (approximately 4,000 mi^2) and geographical isolation of this population.

We are currently working with biologists from the Maine Department of Inland Fisheries and Wildlife (MDIFW) and Adirondack Ecological Center (SUNY-ESF) investigating harvest dynamics of marten and fisher relative to American beech mast cycles and small mammal population fluctuations. During the period 1992-2003, beech mast production was cyclical; mast failures occurred during odd years and large mast crops were produced during even years. Small mammal abundance and harvests of marten and fisher were synchronous with these mast cycles. Preliminary results suggest that harvest fluctuations are primarily a function of differential trapping vulnerability during these mast cycles and not a numerical response to subsequent cycles in prey populations.

Distribution and Habitat Modeling

We completed a GIS database of marten harvest locations (n = 1,500) and observational reports (n = 200) from 1978-2004. We will be using this database to better understand marten distribution, model landscape-scale habitat selection, and identify trapping refugia in the Adirondacks.

In January 2005 we initiated a project to document the occurrence and distribution of marten in the Adirondacks using photographic bait stations and snow-tracking techniques. We are targeting our surveys in the northern Adirondacks (2,000 mi^2) where the marten trapping season is closed and in areas of the central Adirondacks (6,000 mi^2) where we lack harvest data (identified from our database). We plan to conduct field surveys for at least the next 5 years. We also plan to evaluate snow-tracking surveys as a harvest-independent population monitoring tool for marten.

Preliminary findings of the Kings River Fisher Project

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We have been studying the demography of fishers living at the northern end of the species' range in the southern Sierra Nevada. Our study was conducted on the west slope of the Sierra Nevada mountains in a 314 km^2 area that ranged in elevation from 1110 to 2282 m and included a mix of public and private land. The bulk of the study area was contained within the USDA Forest Service-administered Kings River Administrative Study

Area. We used mark-recapture methods with camera traps and genetic tagging to derive population parameter estimates. Field work was completed in October, 2004.

We divided the study area into a trapping grid composed of 314 1 km × 1 km cells. We placed live traps in every other cell within the trapping grid. Field personnel baited traps with raw chicken and a commercial lure and checked them daily for 8 days. Captured fishers were sedated and marked with a microchip tag and a unique combination of colored ear tags with reflective tape. After live-trapping, we deployed camera traps in cells opposite those used for live-trapping. Camera traps consisted of a corrugated plastic box with the infrared trigger of a remote camera system crossing the entrance. These bait stations were also equipped with a hair snaring device for a concurrent genetic tagging study. We visited camera traps every other day for 12 days.

Using camera traps, we derived abundance estimates using the Bowden estimator in the program NOREMARK. The abundance estimate for 2002 was 47 individuals (95% CI: 27-84), 2003 was 42 individuals (95% CI: 25-74), and 2004 was 44 (95% CI: 31-63). After dividing abundance estimates by the sampling area, which equaled the study area surrounded by a buffer the size of the radius of a male fisher home range, we calculated densities of 13 fishers per 100 km^2 in 2002 and 10 fishers per 100 km^2 in 2003 and 2004 (95% CI: 6-20 [2002]; 6-17 [2003]; 7-15 [2004]). The densities we obtained of 10-13 fishers per 100 km^2 are on the lower end of reported values from throughout the fisher's range.

Currently we are developing microsatellite markers that can be used to identify individuals from hair samples. Additionally, we will use these markers to examine relatedness among the 53 individuals that have been live-caught since the Kings River Fisher Project began in 1999. We will also continue analyzing the camera data to estimate survival and recruitment rates and will compare these results to those obtained using genetic tagging of snared hair.

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

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ABSTRACT: Fisher (*Martes pennanti*) populations were purportedly extirpated from Montana by 1930 and extant populations are assumed to be descended from translocated fishers. To determine the lineage of extant fisher populations, we sequenced two regions of the mitochondrial DNA genome, the control region and Cytochrome-b *(Cytb*), on 207 tissue samples from British Columbia, the upper Midwest of the United States, and two distinct regions of Montana. In northwest Montana, fishers share haplotypes with samples from the upper Midwest and British Columbia; in west-central Montana, we detected haplotypes characteristic of British Columbia samples, but additionally detected a control region and Cytb haplotype not found in source populations. Based on the unique haplotypes found in west-central Montana, we propose that individuals with these haplotypes are maternally descended from a relic population. Fisher in northwest Montana are likely descended from translocated fishers from the Midwest and British Columbia.

IN PRESS, JOURNAL OF MAMMALOGY (in print April 2006)

The effects of off-highway vehicles on American martens (*Martes americana*) in California, USA Project update: September 2005

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Introduction

The use of Off Highway Vehicles and Over Snow Vehicles (hereafter OHVs) for recreation in California is growing along with the burgeoning population of the state. Managing this growth in a manner that is consistent with multiple land management objectives poses a mounting challenge to land managers and the OHV user community. Although there are a number of reviews of the effects of recreation and OHVs on wildlife there have been few studies directed at the effects of OHVs on top predators, and none addressing American martens (*Martes americana*) specifically. To address the need for information on the effects OHVs may have on American marten populations in California, we initiated a 2-year study beginning in 2003 in the Sierra Nevada mountains of California. This study compares the

spatial relationship of marten occurrence with the distribution of OHV use, OHV noise, and of suitable habitat under the assumption that if OHV use is perceived as a threat, martens will disproportionately occur in areas where OHV use is low relative to areas where it is high.

Methods

The study design is based on the need to relate an index of occurrence of martens to 3 potential explanatory variables: (1) OHV use, (2) OHV noise, and (3) suitable habitat. The study was replicated in 2 areas in the Sierra Nevada mountains, the Lake Tahoe Basin Management Unit and High Sierra Ranger District of the Sierra National Forest, both administered by the U.S. Forest service. Each study area was divided into two adjacent subunits, one area where OHV use was permitted and encouraged (Use area) and one area where OHV use was prohibited (e.g., Wilderness areas; Non-use area). Boundaries of the two subunits were selected to create similar-sized areas (45 km^2 each) that were also similar in respect to their predicted suitability as marten habitat. Each sub-area was divided into a set of 2-km^2 hexagonal sample units. This is about one-half of the average size marten home range in California and was selected to provide sufficient resolution to capture relative exposure to OHV noise in different marten home ranges. We identified and attempted to sample at least 20 sample units in each subunit of the study area for a total of 40 total sample units for the each study area. Sampling of marten occurrence and of OHV use and noise was conducted year round and was divided into 2 seasons of OHV use (Summer: 30 June – 15 September and Winter: 20 January to 27 March) and the 2 intervening seasons when OHV use is reduced (Fall: 10 October to 15 December and Spring: 27 April to 25 June).

Marten Sampling

Primary Response Variable – Occurrence: Marten occurrence in each sample unit was determined by using baited track plates, baited remote cameras, and snow-tracking. We established 3 stations in the center of each sample unit, each separated by 250 m, and each 636 m from the edge of the unit and 1270 m from the nearest station at an adjacent unit. During the seasons without snow, summer and fall, we established a single sooted track plate at each of the stations in each sample unit. Each station was baited with chicken and run for 12 consecutive days. A commercial trapping lure (Gusto, Minnesota Trapline Products, Pennock, Minnesota, USA), was placed at each station when it was established as an olfactory attractant. Each station was visited every 3rd day (total of 4 visits) to collect tracks, replace bait, and replace track plates as needed.

During the seasons with snow, winter and spring, we established a single Trailmaster camera system at 2 of the 3 stations in each sample unit. The systems were deployed on single trees with a plastic shield to shed snowfall without triggering photographs. Each camera station was baited with chicken, received trapping lure, and run for 15 consecutive days. Cameras were visited every 5th day (total of 3 visits) to collect film and replace bait as needed. During these seasons, snowtracking was also conducted at each station and on two transects, the first occurred from the sample unit entrance location to the first station, and the second from the first to the second station.

Secondary Response Variables - Activity pattern and Sex ratio: The methods we use to determine the occurrence of martens in each sample unit also produce collateral information that is of value in addressing secondary effects of OHV use on marten behavior and demographics. During seasons when cameras are our primary sampling device we receive information about the time when martens visit bait stations and are photographed. If martens in the Use Area appear at different times of day than in the Non-Use Area, this may mean that martens are adjusting the active phase of their circadian rhythms to avoid the time of day when disturbance by humans is greatest. We are currently organizing and analyzing these data to determine whether activity times differ in the two areas.

The use of track plates also provides us the opportunity to gather incidental information on the effects of OHV on the sex ratio of animals that use each of the areas. Martens are sexually dimorphic and a study in Ontario determined that the tracks of males are significantly larger in specific dimensions compared to females. Although we have not conducted a similar analysis for martens in California, we plan to measure the length and width of selected tracks from each sample unit to determine whether the proportion of large to small track sizes differ in the Use and Non-Use Areas.

OHV Sampling

Sampling OHV use - We sampled the frequency as well as the spatial and temporal patterns of OHV use on major roads and trails during each season within each sample unit. We used a combination of Trailmaster 1500 event recorders with camera units (TMs) and Larson-Davis 720 Type II sound level meters (SLMs), placed on the most highly used road or trail within a sample unit. Each device was established concurrently with the marten sampling stations and run for the 12 (Summer and Fall) or 15 (Winter and Spring) day

period for each season. TMs provided information on the frequency and time of vehicle passes and a subsample of photographs of vehicle types (e.g., 4WD truck, ATV, trail bike). SLMs also provided information on the frequency and time of vehicle passes, but captured a continuous sample of the vehicle types passing; which are identified by their unique acoustic signatures. We used the SLM data to generate a weekly pass profile and an estimate of the total number of passes by each vehicle type, in each season, for every sample unit in the Use areas.

We plan to combine our seasonal point estimates for major roads and trails with GIS coverages of the road and trail networks for each study area. During the winter we also physically mapped (on U.S.G.S. 7.5 minute topographic maps) the snowmobile routes we encountered while traveling within the study area. These mapped routes were then digitized to create a GIS coverage of specific snowmobile use areas. We plan to create a seasonal index of vehicle use frequency for all sections of roads and trails to generate estimates of the total length and density of OHV routes in several frequency of use categories.

Sampling OHV Noise – In addition to sampling OHV activity using SLMs, real-time data were collected to obtain more detailed information about the noise levels produced by specific types of OHVs under controlled speed and terrain trails. This data will be used in addition to the weekly profiles of vehicle passes on each section of road and trail to parameterize a NOISEMAP Simulation Model to generate estimates of sound distribution and intensity across the study area and, therefore, for each of the sample units where we collected marten data.

Progress to Date

In September, 2005 we completed field data collection in our second study area. Completion of data analysis and production of a final report is anticipated by the spring of 2006. Please contact us if you are interested in obtaining a copy of the final report. The progress report from our first study area and year of work can be downloaded at:
http://www.fs.fed.us/psw/publications/4251/onlinewild.html

Upcoming Meeting

Fisher and Marten in California:
Moving Science and Management Forward
Feb 7 & 8, 2006 – Doubletree Hotel, Sacramento

This symposium will include:

- Updates on research and status of the fisher and marten in California
- A forum for wildlife managers and scientists to identify critical information needs

Evening poster session and mixer

More details and registration materials available at the Annual Conference web page: www.tws-west.org

The above photos (*M. americana*) were captured by Chris M. Schumacher on the Huron-Manistee National Forest (Lower Peninsula of Michigan) winter 04/05 as part of a study to determine status, genetics and habitat use of the population. The study participants are as follows: Central Michigan University, Little River Band of Ottawa Indians, Grand Traverse Band of Ottawa Indians, Michigan DNR, and Huron-Manistee National Forests. The population was established into the Lower Peninsula in 1985-1986 after turn of the century extirpation. Note the blond color phase of the female in the bottom photo. The top photo is of a male.

Recent *Martes* Literature

See previous issues for additional literature.

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