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The rabies reporter

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April - June 2011

Another calm quarter on the rabies front

Beverly Stevenson, Ministry of Natural Resources

April, May and June were very quiet months with only four rabies cases in total – all of them occurring in a 15-day period.

Three of those cases were rabid bats from Durham, Wentworth, and Niagara regions. All were big brown bats. The fourth case was a rabid cow with 'Ontario fox' variant from Grey County, discovered in early June.

As with all of the 'Ontario fox' strain rabies cases in 2010, MNR immediately responded by distributing rabies baits at high density in an 8km by 8km plot surrounding the case.

The cow created a little more work than last year's skunks though. With the skunks, we assumed that they had stayed within their normal home range while they were capable of transmitting rabies. Cows, on the other hand, tend to get moved around especially in the spring when they are put out on pasture. Such was the case with this cow. Fortunately, it had only been moved once - from the farm where it over-wintered approximately one week prior to its death. Since the incubation period for rabies is normally 3-4 weeks, it was safe to assume that the cow had been infected at the farm where it over-wintered. Had the cow been relocated approximately a month before it died, we would have had to distribute baits over a much larger area. Instead, we distributed baits in a plot surrounding the original farm, as well as at the farm where the cow died.

Figure 1. Location where rabid cow was found in relation to previous baiting areas.

The location of the rabid cow was no surprise. As illustrated by the cross-hatched area in Figure 1, it was located directly between recent rabies cases. The green shaded areas indicate where high density baits were distributed in 2010 in response to cases from late 2009 and 2010. Given the persistence of cases, we'll be keeping a close eye on this area in the upcoming months.



The Rabies Reporter, a scientific newsletter about current issues in rabies research and control, is a joint effort of the Rabies Research Unit of the Ontario Ministry of Natural Resources; the Rabies Laboratory at the Ottawa Laboratory (Fallowfield) of the Canadian Food Inspection Agency; and the Ontario Ministry of Health and Long-Term Care. Articles for future issues will be welcomed by the editor. The Rabies Reporter is not refereed, and should not be cited in papers intended for refereed journals. Send contributions, letters and inquiries to:

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Bat rabies not as prevalent as many estimates suggest

Louise Taylor, Global Alliance for Rabies Control

Estimating the prevalence of rabies in wildlife is usually accomplished by sampling those animals that come into contact with humans or pets. A new study on bats, by Brandon Klug from the University of Calgary, Canada and others suggests that these methods can overestimate prevalence by an order of magnitude.

Given the nocturnal and elusive nature of many bats, especially migratory or tree roosting ones, human contact with healthy bats is a rare phenomenon, and studying rabies epidemiology in these hosts is difficult. Rabies prevalence estimates have been highly variable among species and across years within species. The authors set out to test whether some of this variation could be due to fluctuations in the frequency of human contact with infected individuals, rather than the prevalence of the virus.

Instead of sampling from near human habitation, in this new study, populations migrating past wind farms in Southern Alberta, Canada were sampled. The migratory tree-roosting hoary bat (*Lasiurus cinereus*) and silver-haired bat (*Lasionycteris noctivagans*) comprise over 90% of bat fatalities at these sites, and both have previously shown high rabies prevalences. Almost 1,000 bat carcasses of 5 species were collected, and 121 *L. cinereus* and 96 *L. noctivagans* specimens were in a suitable state to be tested for rabies. Carcasses were tested at the Centers for Disease Control and Prevention (CDC) in Atlanta, USA using the direct fluorescent antibody (DFA) method. Only one bat carcass (of *L. noctivagans*) tested positive.

A total of 33 previously published studies on rabies prevalence in 37 species of bats were also compiled to give one estimate of rabies

prevalence based on all passive surveillance data (usually individual bats found near humans) and one prevalence based on active surveillance data (attempts to randomly sample bat populations) for each species. The new wind farm data showed rabies prevalences significantly lower than previous passive surveillance studies (23.7% and 8.0% for *L. cinereus* and *L. noctivagans*, respectively), but similar to previous active surveillance studies (1.1% and 1.0%). Across all of the species sampled in the published studies, passive surveillance methods generated significantly higher prevalences (6.0% of over 50,000 bats) than active surveillance methods (0.8% of almost 15,000 bats). This demonstrates a difference which has often been discussed, but not previously tested statistically.

The authors also compared prevalences of rabies in bats differing in their roosting behaviour. Nonsynanthropic bat species prefer natural roosts such as trees, caves, and rock crevices, whereas synanthropic species have adapted to roost in manmade structures such as buildings and bridges. Overall, nonsynanthropic bat species had a higher rabies prevalence (7.8%) than synanthropic species (4.2%), and again, passive surveillance produced higher prevalences than active methods for both groups. Nonsynanthropic bat species comprised only 19.7% of bats tested, but formed a disproportionately high proportion (30.1%) of those found positive. This is in agreement with a previous observation that when sample sizes are smaller, the prevalence of rabies is often higher. In other words, when individual bats that would rarely encounter humans do come into contact, they are more often sick individuals.

The authors suggest that the type of surveillance used and the roosting behaviour of the species need to be taken into account in interpreting bat rabies prevalences. Although passive surveillance clearly has an important role in assessing threats to human health, it may not provide an accurate population-wide prevalence of rabies.

Results from this survey and others of natural populations of bats suggest rabies prevalence around or below 1% across all bat species, regardless of roosting ecology. Despite the confirmation of a lower prevalence of rabies than previously thought, handling live bats by the general public is discouraged, as bats that uncharacteristically come in contact with humans are more likely to be sick.

Reprinted with permission from Rabid Bytes newsletter. (Summarised by Louise Taylor from Klug et al (2011) Journal of Wildlife Diseases, vol 47, p64–77.)



Rabies Advisory Committee members re-appointed for another three years

Beverly Stevenson, Ministry of Natural Resources

The Rabies Advisory Committee (RAC) was established in 1979 through an Order in Council to respond to the concern about the prevalence of animal rabies in Ontario. Through a series of extensions, the Rabies Advisory Committee has continued from 1979 to present.

Member appointments to the committee were set to expire on August 15, 2011. Thanks to Gina Cunningham, the policy liaison specialist with the Ministry of Natural Resources, the re-appointment process was smooth and committee members have been re-appointed for another 3-year term.

The roles and responsibilities of the Committee are to:

- Provide a broad range of knowledge to advise researchers and the Ministry;
- Monitor the results of and assess the performance of the Ministry of Natural Resources, their collaborators, and their contractors;
- Review and make recommendations on solicited and unsolicited research projects and monitor progress of projects;
- Review and contribute to the priority settings of projects and proposals of contractors and the Ministry;
- Represent the Ministry's interests to review and undertake field trials through the Canadian Centre for Veterinary Biologics of the Canadian Food Inspection Agency; and
- In conjunction with the Ministry, maintain liaison among provincial and federal organizations involved in rabies-related research and in wildlife, domestic animal, and public health policy.

Rabies Advisory Committee Achievements to date:

- fostered effective partnerships of government (provincial and federal), private industry and universities resulting in an excellent cooperative network that encourages innovation and applied research;
- assisted Ontario in achieving effective understanding of the rabies problem and in generating support among municipal councils and the general public for the development of a control program;
- helped Ontario become a world leader in certain aspects of rabies research, especially mass production and distribution of baits to vaccinate free ranging wild animals against the disease.

With the assistance of RAC, the MNR has:

- provided scientific and technical assistance to several states and provinces including: Quebec, New Brunswick, Newfoundland, Texas, New York State, Vermont, Maine, New Hampshire, Ohio, Virginia, West Virginia, Pennsylvania, Georgia, Alabama, Tennessee, and Florida;
- developed an effective and economical approach to rabies control;
- successfully contained raccoon rabies to a small area in eastern Ontario leading to its elimination; and
- successfully eliminated fox rabies from southeastern and southcentral Ontario.

Thanks to Chairman Jim Broadfoot (*Azimuth Environmental Consulting Inc.*), Peter Buck (*Public Health Agency of Canada*); Doug Cambell (*Canadian Cooperative Wildlife Health Centre*), Michael Corriveau (*Renfrew County and District Health Unit*), Catherine Filejski (*Ontario Ministry of Health and Long-Term Care*), Bruce McNab (*Ontario Ministry of Agriculture, Food, and Rural Affairs*), Dean Middleton (*Ontario Agency for Health Protection and Promotion*), and Elliot Salsberg (*Canadian Food Inspection Agency*), for their continued contributions to the Rabies Advisory Committee.

Klaus Nielson (*Canadian Food Inspection Agency*), who has been a member of the committee since its beginning, has retired from CFIA and from the committee. His position on the committee will be left vacant. Klaus has been the longest standing member of RAC and his expertise and contributions will be missed. Thank you Klaus!



Don't forget...

It's World Rabies Day on
September 28th!

For more information, visit
www.worldrabiesday.org

Indigenous Pathogen Bio-Containment Level 3 Laboratory (IPCL3) at Trent University

Peter Bachmann, Ministry of Natural Resources

Trent University, in partnership with the Ministry of Natural Resources, has a new Indigenous Pathogen Bio-Containment Level 3 Laboratory (IPCL3). The lab was built in 2006 and has been undergoing infrastructure assessment and upgrades for the past five years in order to become fully certified. In May 2011, the lab was certified for use by Canadian Food Inspection Agency and Public Health Agency of Canada.

Laboratories in Canada, as much of the rest of the world, are classified to Containment Levels 1, 2, 3 or 4 (4 being the highest). Containment Level is mainly defined by the Risk Group of the pathogen being used in the laboratory: Risk Group 1, 2, 3 or 4 (4

being the highest). Most of the laboratories at Trent University are Containment Level 1 (low risk), however there are two Containment Level 2 laboratories (moderate risk), with one being the post-mortem laboratory used by Ministry of Natural Resources.

Pathogens which require a Containment Level 3 (high risk) laboratory can have serious human, or plant or aquatic or environmental health implications but are not particularly contagious. In Canada there are about 100 Containment Level 3 laboratories operated by governments, universities and private industry (e.g., pharmaceuticals). In Ontario, at least 5 universities have Containment Level 3 facilities. There is one Containment Level 4 (highest risk) in Canada (Winnipeg).

The IPCL3 differs from most other Containment Level 3 laboratories in that it will be certified only for work with pathogens which are 'indigenous' (already exist in Canada); 'exotic' or non-indigenous pathogens are prohibited. However, if an 'exotic' pathogen enters Canada and becomes enzootic, much like West Nile Virus, it will be re-defined as 'indigenous'.

The new lab has been certified for in vitro work with the Rabies (virus), Bovine Tuberculosis (bacterium), Hantavirus, Chronic Wasting Disease (prion), and West Nile Virus. Although these diseases are predominantly wildlife in origin, most of the agents are zoonotic, or transmissible to humans. Additional pathogens may be added to the list, but each new agent requires a certification upgrade. Most of the research in IPCL3 will be related to wildlife research and management:

- Active Survey and Developmental Diagnostics of the respective diseases
- Genetic and Genomic Research (sometimes associated with Diagnostics), and, perhaps
- Proteomics in the case of Chronic Wasting Disease

The majority of IPCL3 users will be Ministry of Natural Resources and Trent University researchers, however, outside agencies may also apply to use the facilities. Staff training is currently taking place and it is anticipated that the lab and staff will be in full swing sometime this fall.



MNR wildlife technician, Andrew Silver, will be trained to work in the new Indigenous Pathogen Bio-Containment Level 3 Laboratory (IPCL3)

Remembering a friend and colleague

Rabies Research and Development Unit staff



Kirk with a newly collared moose calf during the moose population and predation research project.

hockey player and member of the Rabies MNR hockey team (the Bandits) for 11 years. When the Bandits formed as a team in 2001 Kirk was a founding member. He taught himself to play hockey, organized team sponsorship for our jerseys, and made the long pilgrimages north each March to play in the MNR provincial hockey tournaments. Kirk may have had limited success in scoring goals but was always a favourite on the team with his humour, lively banter in the change room, and quick wit on the bench.

Kirk was a family man, who loved to spend time with his two daughters, Brenna and Kalynn, and his wife, Sue.

Kirk's research and technical contributions to the RRDU have helped shape our programs; his friendship and kindness, a lasting legacy in our workplace.

His fantastic sense of humour, positive outlook and the mischievous "twinkle in his eye" will be remembered and missed by all.

This spring, the MNR Rabies Research and Development unit (RRDU) lost a dear member of the team, Mr. Kirk Sobey.

Kirk worked as a research biologist with the RRDU for eleven years and contributed immensely to the design and implementation of many rabies control programs and research studies. Notably, his research on the efficacy of Imrab rabies vaccine in raccoons and skunks was published in the *Journal of Wildlife Diseases*. His recent research on the shedding on ONRAB® oral rabies vaccine in target and non-target animals will be completed and published in a scientific journal.

In addition to rabies control programs, Kirk worked on the Fur Management program and the Ontario elk research program. He assisted with the aerial elk survey, as well as the capture and radio-collaring of elk this spring. One of his last ventures resulted in naming the three elk he darted and immobilized in April after his family, Sue, Brenna and Kalynn.

Outside of work, Kirk was an avid angler and hunter, with a passion for the outdoors. His enthusiasm for sports was obvious as an active



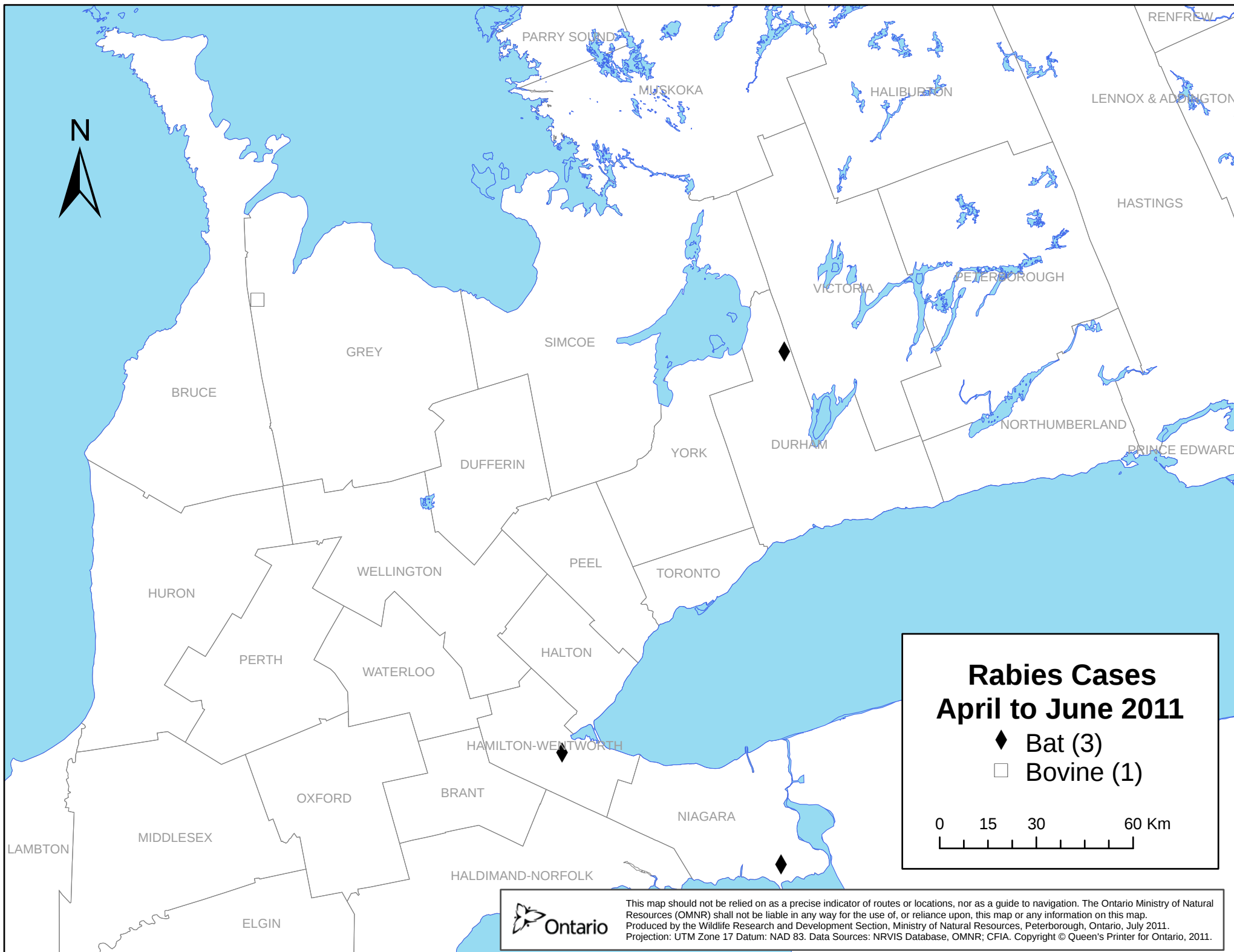
Happily working on the elk study, Kirk gets up close and personal while darting elk.

Animal Rabies Report: April to June 2011

[illegible]

Animal Rabies Report: April to June 2011

Animal Type	Fox			Raccoon			Skunk			Other Wildlife			Bat			Dog			Cat			Livestock			Totals		
County or Region	Cumulative			Cumulative			Cumulative			Cumulative			Cumulative			Cumulative			Cumulative			Cumulative			Cumulative		
	#	11	10	#	11	10	#	11	10	#	11	10	#	11	10	#	11	10	#	11	10	#	11	10	#	11	10
Southern																											
Wentworth													1	1											1	1	0
Haldimand-Norfolk															1										0	0	1
Brant																									0	0	0
Niagara													1	1											1	1	0
Elgin																									0	0	0
Oxford																									0	0	0
Middlesex																									0	0	0
Lambton															4										0	0	4
Kent																									0	0	0
Essex																									0	0	0
Northern																											
Muskoka																									0	0	0
Parry Sound																									0	0	0
Nipissing																									0	0	0
Sudbury																									0	0	0
Cochrane																									0	0	0
Timiskaming																									0	0	0
Algoma																									0	0	0
Thunder Bay																									0	0	0
Rainy River																									0	0	0
Kenora																									0	0	0
Regional Totals																											
Eastern	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Central	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3	0	0	0	0	0	0	0	0	0	1	1	3
Western	0	0	0	0	0	0	0	0	6	0	0	0	0	2	2	0	0	0	0	0	0	1	1	0	1	3	8
Southern	0	0	0	0	0	0	0	0	0	0	0	0	2	2	5	0	0	0	0	0	0	0	0	0	2	2	5
Northern	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	0	0	0	0	0	0	0	0	6	0	0	0	3	5	11	0	0	0	0	0	0	1	1	0	4	6	17



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