

The Rabies Reporter

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1994 IN REVIEW 606 RABID ANIMALS IS A RECORD LOW FOR OVER 30 YEARS!

Rabies cases province-wide in 1994 (606) reached the lowest level since 1961 (601). Unravelling why there were so few cases was more difficult. The success of the bait program in eastern Ontario certainly made a major contribution. If the 4-year cycle of the 1970s and '80s were still active, there should have been a major rabies outbreak in

eastern Ontario between October 1994 and February 1995. That has clearly not happened. Since the average for eastern Ontario was 389 cases a year, and an outbreak would give above-average figures, the reduction due to baiting was large.

Digging deeper for an explanation of the very low last quarter figures in 1994 proved more difficult. It was tempting to speculate that the very clear drop in rabid foxes, compared to rabid skunks, might be an early result of the expanded bait drops of 1994.

However, in the past history of rabies in southern Ontario, there have been 12 (out of 151) quarters in which the number of rabid skunks outnumbered the number of rabid foxes. Those were short-lived events, at the end of major rabies outbreaks, when rabies in foxes had burned out, but the disease smouldered on in skunks for a few months. Given the high levels of rabies in foxes during 1993 and early last year, this is a possible explanation. Three graphs may help to understand the situation. Figure 1 shows the overall rabies history since 1957. Figure 2 highlights eastern Ontario, while figure 3 shows the last 5 years (by quarter) in each of the Rabies Reporter Regions. In figure 3, there are large "B"s to show

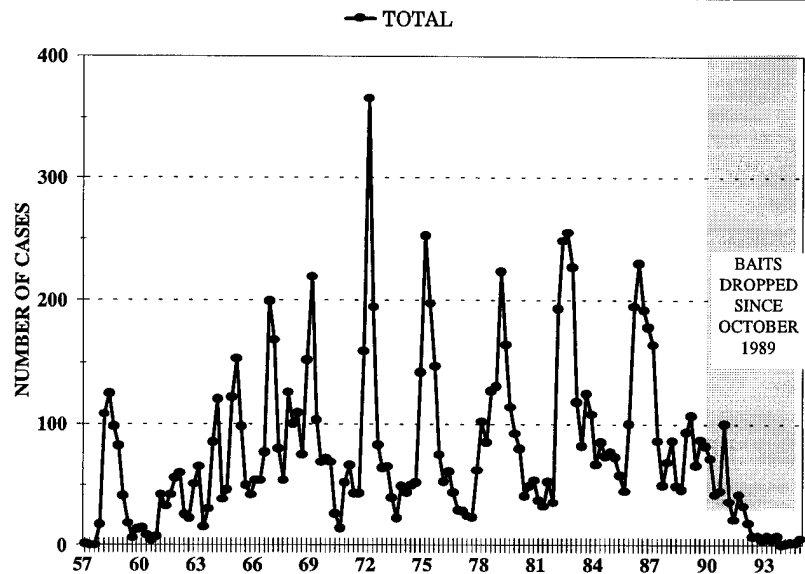


Figure 2. Total rabies cases in eastern Ontario, by quarter.

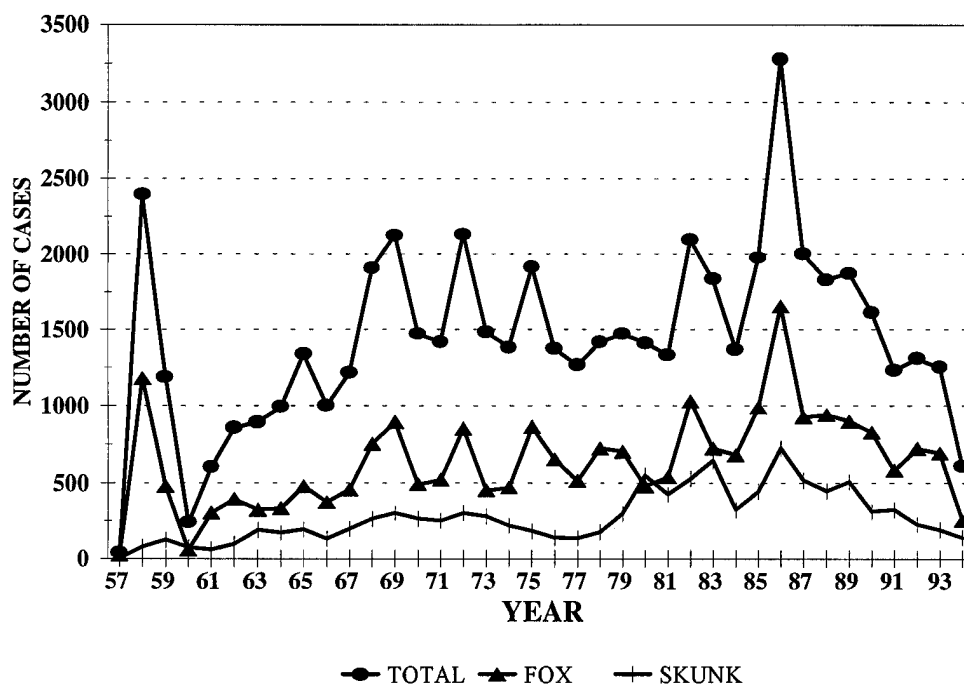


Figure 1. Annual totals of rabies cases in Ontario

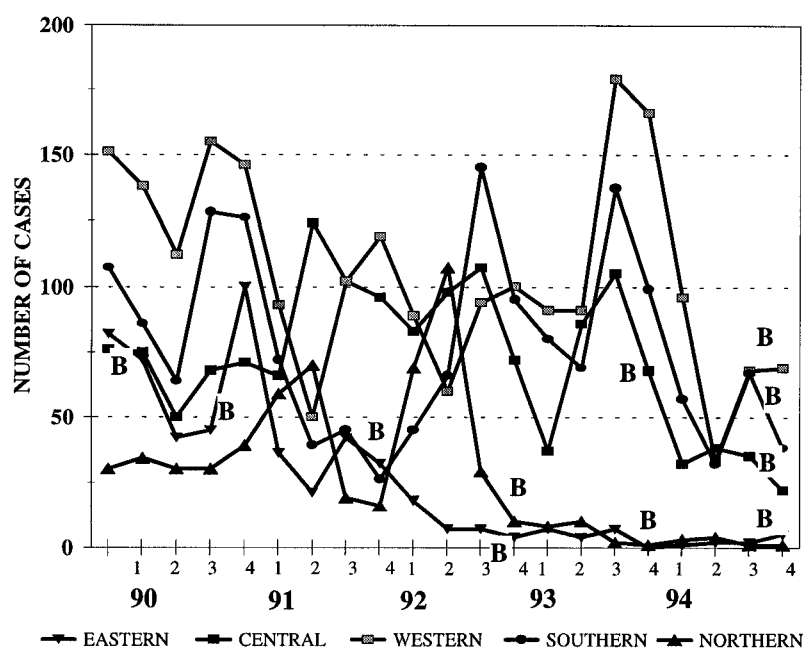


Figure 3. Total rabies cases, by quarter, 1990 -1994 in the five regions used by the Rabies Reporter. The letter "B" shows when baits were dropped in all or part of a region.

when baits were dropped in each region. Table 1 shows the actual numbers of cases in eastern Ontario. In figure 3 and table 1 it is clear that it took at least two bait campaigns in eastern Ontario before rabies levels dropped to unusually low levels. However, remember that only 62% of eastern Ontario was baited in 1989. Therefore, perhaps you should look for a large effect only after the 1990 campaign, meaning look for a decline in fox cases in 1991. That did happen, and the number of rabid skunks outnumbered the rabid foxes. It is premature to ascribe the very favorable figure of the last quarter of 1994 entirely to baiting, but if the pattern continues in 1995, that interpretation may change.

If you are "into" reading graphs, figure 3 is especially interesting. At first glance this graph seems to show chaos. In fact, the ups and downs of rabies in the regions used in the Rabies Reporter show little relation to each other. However, in the three regions which still had rabies in 1994, rabies cases were dropping sharply *before* the baits were dropped in September, a fact noted in the last Rabies Reporter. Therefore, perhaps the low numbers of cases in the last quarter were a natural event, unrelated to baiting. On the other hand, as noted in the last issue, starting to bait when rabies is already low is a good tactic. The last word is *wait*. The effect of baiting will be plain after another year.

Post-exposure treatments were administered to 1437 people in 1994. That represents 2.4 treatments per rabid animal, which seems high, compared to the long-term average of about 1.2. However, the figure for 1993 was comparable: 2586 people were treated, compared to 1234 rabid animals, a ratio of 2.1 treatments per case. Are there any explanations of why treatments are going up at this time?

Charles D. MacInnes
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RABIES IN NEW YORK STATE 1994.

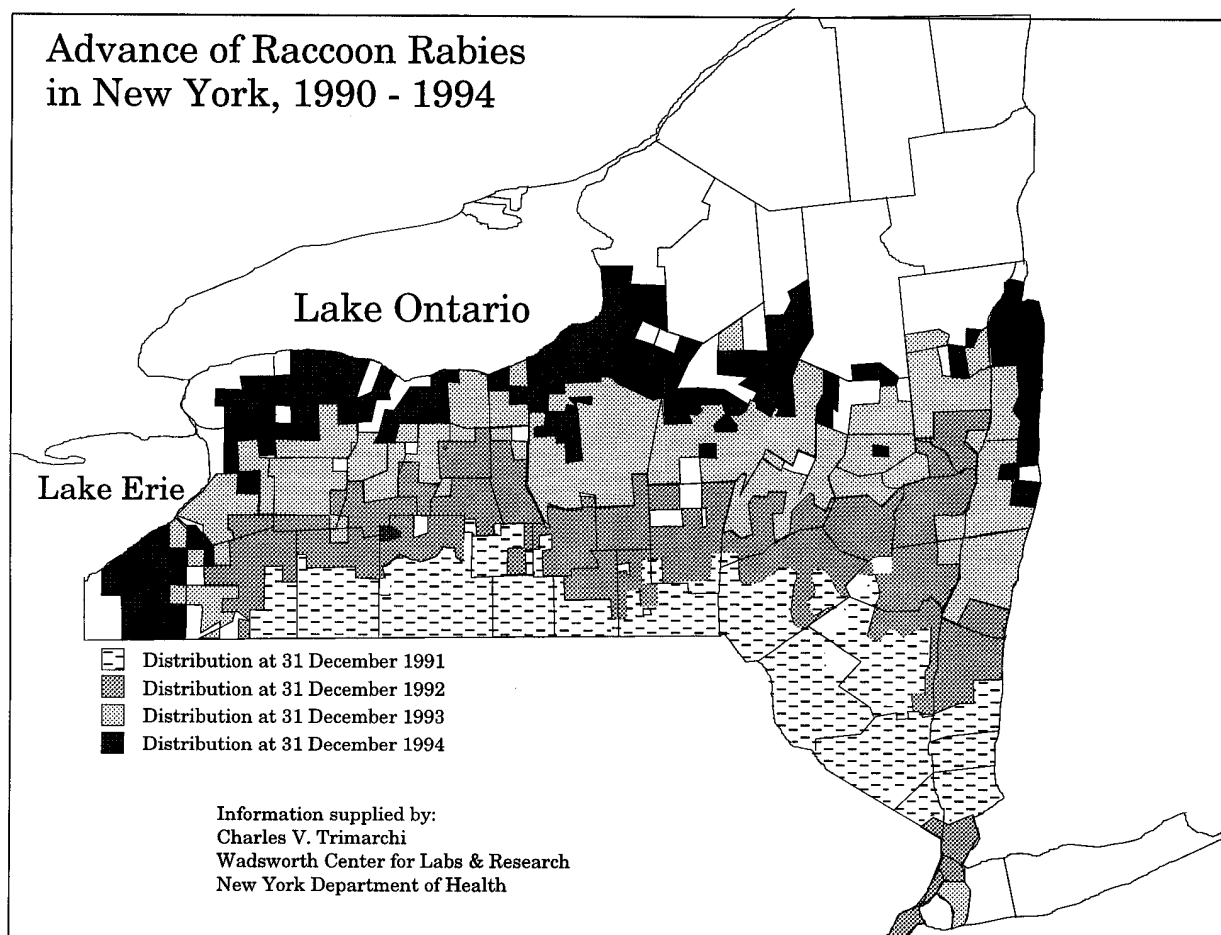
The raccoon rabies outbreak that has affected the state since 1990 continued to spread during 1994, while it persisted as a major public health problem in previously affected areas. The disease moved from 10 to 40 miles north, east and west from the previous front during the year, spreading into five additional counties. By the end of the year, rabies associated with this outbreak had been reported from 779 New York towns in 54 counties. Only Kings County, Long Island and five northern counties have yet to be affected by this intense outbreak. Meanwhile, rabies in bats was once again geographically widespread in the state. While there were no cases of rabies associated with the red fox outbreak that had affected northern counties from 1990 to 1993, the disease persisted in foxes in bordering areas of Vermont and Quebec.

During 1994 the Wadsworth Center Rabies Laboratory examined 8,732 animals from all of New York State and the New York City Rabies Laboratory examined 714 from the five boroughs of New York City. The 9,446 animals examined was more

Table 1. Numbers of rabies cases, by species, in eastern Ontario

Year	Fox	Skunk	Bat	Companion	Domestic	TOTAL
1970-89 Mean	222	60	6	28	67	389
1990	146	42	8	19	73	293
1991	30	44	6	14	12	116
1992	8	12	4	0	10	34
1993	4	3	8	0	1	16
1994	0	1	5	0	3	10

Advance of Raccoon Rabies in New York, 1990 - 1994



than three times the annual average for the five-year period preceding the spread of raccoon rabies into New York in 1990. The total was down somewhat from the record total of 11,896 recorded in 1993. Most of the difference is the result of greatly reduced submissions (1,277 fewer) from Albany County, where uniquely aggressive surveillance activity existed when the outbreak peaked there during 1993. The 1994 total brings the number of animal rabies examinations since 1991 to a four-year total of 37,793. The Wadsworth Center Rabies Laboratory also performed 1,282 rabies antibody assays on human serum to determine the need for vaccine booster injections. This was the largest annual number of rabies antibody assays recorded for the state.

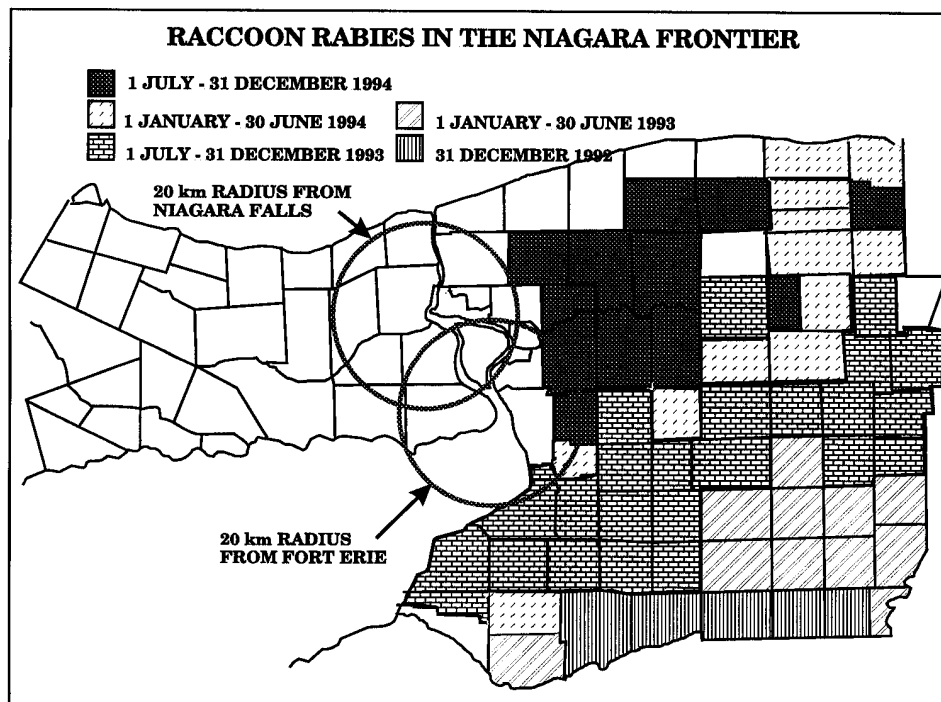
The 2,773 cats examined constituted 29.4% of all animals tested for rabies, and 64.7% of all domestic animal examinations. The 2,406 raccoons tested accounted for 25.5%

of the animals examined. Among animals submitted to the Wadsworth Center, bites to humans had been reported in 29.9% of all the animals received, in 49.3% of the domestic animal submissions, and 9.6% of the wild animals examined. Non-bite human contact was reported in 37.7% of submissions, and contact with a domestic animal in 43.6%. The laboratory also tested 2,228 animals with no reported contacts, representing 25.5% of all examinations.

There were 1,585 laboratory confirmed rabid animals in New York State in 1994, among the 9,446 examined (16.8% positive). The number rabid was 420 (36%) greater than the annual average for the previous five-year period, but 1,162 less than the national record established in New York in 1993. The decline from the 1993 total is largely the result of 778 fewer cases in Albany County.

Among 5,162 wild animals examined, 1,532 (29.7%) were rabid. Rabid raccoons (1,284) accounted for 83.8% of rabid wildlife and 81% of all rabid animals. Other rabid wildlife included 170 skunks, 42 bats, 12 woodchucks, 11 red foxes, 11 gray foxes, a beaver, a white-tailed deer, a fisher and an opossum. The single case of rabies in a white-tailed deer was remarkably fewer than the 18 cases recorded in 1993. The number of deer examined was down 62.4%, from 295 to 111.

Among the 2,109 raccoons tested at the Wadsworth Center, 967 (45.9%) reportedly had contact with a human, 188 (5.6%) had contact with a cat, and 1,294 (61.3%) contact with a dog. Among the 1,284 rabid raccoons, 575 (44.8%) reportedly had human contact, 84 (6.5%) contact with a cat and 943 (73.4%) contact with a dog. It is noteworthy that while the overall positivity among raccoons was 1,284/2,109, or 60.9%, the positivity



among raccoons in contact with dogs was 943/1,294, or 72.9%.

Rabies was confirmed in 52 domestic animals among 4,284 examined (1.2%). Rabies was again far more common in cats (31) than in dogs (4 in 1994), as it has been each year and cumulatively (131 to 33) since 1990. Rabies in cats accounted for 59.6% of all domestic animal rabies in the state. Other rabid domestic animals included 9 cattle, 7 horses and a rabbit.

The 42 rabid bats were typically widespread across the state, with at least one case occurring in 35 towns from 22 counties. Overall, 4.2% of the 1,031 bats examined during 1994 were rabid. The big brown bat accounted for 572 (55.5%) of the bats tested, and 33 (78.6%) of the rabid bats. Other rabid bats included 3 little brown bats, 2 Keen's brown bats, 1 red bat and 22 unidentified to species. The positivity rate among big brown bats was 5.8%, while it was 2.0% for other species combined. These data are remarkably similar to the cumulative data from 17,366 bats tested at the Wadsworth Center Rabies Laboratory since 1981: 733 rabid for an overall positivity of 4.2%; big brown bats accounted for 59% of the bats submitted and 84% of the

rabid bats; positivity among big brown bats was 6.0%; 1.7% were positive among other species combined.

Among the 1,011 bats received for examination at the Wadsworth Center during 1994, 407 (40.2%) had reported contact with a human, 509 (50.3%) had cat contact, and 69 (6.8%) contact with a dog. Among the 42 rabid bats, 17 (40.4%) had human contact, 14 (33.3%) contact with a cat, and 5 (11.9%) had dog contact.

New York City data were provided by Dr. Igal Poshni, Director, Virus Laboratory, City of New York Department of Health.

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AN ONTARIO PERSPECTIVE ON RABIES IN NEW YORK, 1994

The two maps of rabies in New York help show when raccoon rabies might arrive in Ontario. Overall

movement seemed less extensive in 1994 than in the previous two years, but that is mostly an impression. The expected jump in April and May was small, but movements in the late summer and fall were significant. In 1994 there was both good news and bad news for Ontario. The good news was that raccoon rabies did not reach the Niagara River during 1994. As New York personnel had noted in earlier years, raccoon rabies travels along streams and rivers more rapidly than it crosses from watershed to watershed. That pattern held during 1994, as raccoon rabies reached the Lake Ontario shore along a wide stretch from about Lockport to northeast of Oswego, yet it did not swing west to the Niagara River shore. The map on this page clearly

shows more northward than westward movement. At year's end there had been 23 cases of raccoon rabies within 20 km of the Canadian border at Fort Erie. Four of these were less than 15 km from the border, with the nearest being only 11 km away. Raccoon rabies is close, but a year ago we predicted that it would be at least along the river in New York, if not actually in Ontario.

The bad news was that the greatest advance in all of New York took place up the east end of Lake Ontario. That put raccoon rabies within 50 km of the St. Lawrence River, in the region of the Thousand Islands. At the end of 1993 we said confidently that raccoon rabies would not reach the St. Lawrence before 1996 at the earliest. Now, it might reach the riverbank in the fall of 1995. The Rabies Unit is therefore planning T-V-R projects at the bridges for the summer of 1995. We are also watching plans for vaccine-bait trials in New York with great interest. One plan would put a band of baits between the front and the St. Lawrence. Ontario should support that initiative enthusiastically.

Raccoon rabies became firmly established in southwestern Vermont

during 1994. Movement up the Lake Champlain shore towards Montreal is therefore likely during 1995.

Charles D. MacInnes

Rabies Unit

Ministry of Natural Resources

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ONTARIO HELPS TEXAS CONTROL RABIES IN COYOTES IN SOUTH TEXAS

On 11 February (Saturday) two Ontario Twin Otters left Pearson International Airport en route to Austin, Texas. The purpose was to drop 850,000 baits in south Texas, to help control an outbreak of rabies in coyotes. That outbreak has also affected dogs, and there was one human death this past summer.

This operation is an important precedent. Chris Nunan, Marty Treitz, Tim Trow and others, plus their Texan counterparts, deserve high praise for having negotiated a legal agreement which enabled the operation to proceed. We in Ontario believe that this sort of help is essential to encourage wider application in the U.S.A. of wildlife vaccination against rabies. The agreement set charge rates which enabled the Ontario government to recover all the associated costs, including staff salaries from the State of Texas. Texas benefitted in obtaining a system for dropping baits which has been proven safe, effective and economical by our operations in Ontario.

The Ontario party consisted of four pilots, two engineers, a radio operator, four Rabies Unit staff, Carolyn Fielding from Queens' and two communications staff. They were to be joined by enough Texans to man the bait drop.

On the Monday there was a training session in Austin for the Texas staff. The plan then called for

the group to fly to Pleasanton, the operations base, and start baiting on Tuesday. Weather intervened, so the planes just sneaked in to Pleasanton under the fog and cloud late Wednesday. They made one short bait flight each on Wednesday, and then got a good start on Thursday. On Wednesday 28 February they flew their last bait flights, and headed for Austin. They were due home late on Thursday, 2 March. Reports reaching Maple before 1 March indicated that the Texas Department of Health staff who planned the operation were very pleased at the smooth way the operation came off.

Pleasanton was chosen for its location, airfield, and lack of competing traffic. According to Chris Nunan, it was like Irvine Lake, with cactus.

The baits were dogfood - polymer and fishmeal - polymer, carrying plastic sachets of V-RG, weighing 36 - 40 grams, and about the size of a small match box. Some adjustments were necessary so that the bait machines would throw these baits well, but such bugs were ironed out early in the project. Target densities were 50 and 75 per square mile, always at 0.5 mile between flight lines.

There will be some first-hand stories in the next issue of the Rabies Reporter, along with many details of the experiments and anticipated results.

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RABIES IN THE AMERICAS CONFERENCE 1994

Almost 300 scientists and others interested in rabies converged on Niagara Falls during four days in November. There was a wide variety in the audience, from international scientists from as far away as Russia

Africa, Asia and Central and South America, to local health inspectors, Humane Society staff, trappers and anyone interested in the topic. Two hundred people registered for the whole conference, while an additional 100 registered for single days. The scientists came to talk about their latest successes and their greatest challenges in combatting rabies.

Others came to learn, and claimed this was one of the best conferences they had ever been to. The Ontario Ministry of Natural Resources was a proud host of this event, the fifth annual international meeting of the Rabies in the Americas Conference.

Discussions focused this year around the theme of coping with invading rabies epizootics. The conference approached the issue of rabies and control from several perspectives, including: Coping with Invading Rabies Epizootics, Pathogenesis of Rabies, Advances in Rabies Vaccines, Developments in Bait Delivery Systems, Rabies Control in the Real World, Epidemiology of Rabies, Public Information Session, Human Safety, Communications and Education about Rabies and its Control, Molecular Epidemiology and Taxonomy of Rabies Viruses and finally, Economic and Administrative Aspects of Rabies and Rabies Control.

Conference organizers arranged to have the 76 presentations run consecutively over four days rather than holding concurrent sessions. In this way, they hoped to provide more opportunity for delegates to attend as many sessions as possible and, at the same time, facilitate the exchange of ideas and experience.

The meeting opened with case studies of how certain North American states and provinces are dealing with the arrival of a new strain, or an 'invasion' of rabies from elsewhere. The first paper was especially interesting to the OMNR Rabies Unit. Laura Bigler from Cornell University described acceptance by raccoons of various baits. One bait she tested was the

Ontario Icing Sugar-Marshmallow bait, but she put a liquid biomarker into the blister-pack. The baits were air-dropped in a rural section of Tompkins County, New York, by an OMNR Turbo Beaver. Eighty-four percent of raccoons were positive for the biomarker!. At the other end of the spectrum was a discussion of the added strain on the administrative side of dealing with an increased demand for rabies diagnostic services. Another paper outlined the use of community empowerment as part of a strategy for prevention and control of rabies.

Scientists were anxious, of course, to learn what developments are taking place in rabies vaccines in centres across the world. There were three major themes, better vaccines for humans, dogs and wildlife, ways to make effective vaccines at lower cost, and tactics for using vaccine. Since rabies in dogs is a major problem in tropical countries, and there are mass-vaccination programs in most Central and South American countries, interest in this topic was great.

Dr Michel Aubert spoke for the team which has virtually pushed fox rabies out of France since 1989. He gave three presentations, on the effectiveness of the field campaigns, on human contacts with baits, and on cost-effectiveness of the approach. A paper assembled by Dr. K. Stohr of WHO, and presented by Dr. F-X. Meslin, took a very critical look at the successes and failures of vaccine-bait campaigns in several countries of western and Central Europe. He concluded that success was best where very large (minimum 15,000 km²) areas were treated uniformly and thoroughly. Attempts to economize by treating only active rabies outbreaks were unsuccessful.

There were several papers on the relatedness of the numerous variants of rabies virus. These were fairly high level discussions, progressing from amino acid or DNA sequences directly into numerical taxonomy routines.

The most effective vaccine is useless unless it reaches the target animal. The session on oral vaccination provided insights on the status of current research on baits and attractants for various species. Ontario's system of mass distribution of baits, for example, was designed for rural areas while another system from New York was developed for delivering baits within an urban setting. The field trial of V-RG vaccine in fishmeal-polymer baits was reported to have held back the advance of raccoon rabies down the Cape May Peninsula in New Jersey. A similar project on the Cape Cod Isthmus in Massachusetts was described, and a simulation model to support it was reported in another session.

Rabies Control in the Real World provided information on the most current methods and successes in different countries. The European experience is impressive because of the size of the areas treated in comparison with the smaller, experimental programs in North America. The European system, however, is relatively expensive. The United States of Mexico reported some notable successes in vaccinating dogs on a large-scale through a national mobilisation of multi-task teams that included assistance from the military.

Friday the conference was given over to themes of communication and public education. Topics ranged from the changes forced upon wildlife rehabilitators by the arrival of raccoon rabies in New York and Connecticut, through the various approaches to public information and education necessary when wildlife baiting programs are undertaken, to some very interesting talks, supported by video presentations, on education measures taken in Mexico, India and other tropical countries. Perhaps it is significant that the session presented by professional public relations people ran more over its allotted time than any other at the conference.

Saturday also saw expansion of a topic treated very lightly at previous conferences. This was the economic and administrative side of rabies control. There is increasing evidence that control of rabies in wildlife aimed at reducing human health care costs is likely to be cost-effective. However, as with most economic projections, a lot depends on the methodology used to estimate both costs and benefits.

The Rabies in the Americas conference continues to be an excellent venue for the transfer of the latest information on rabies. The participants this year had an opportunity to sample a trip over Niagara Falls in a Twin Otter just like those used by MNR for its aerial vaccination program. Virtual reality experiences such as these add to the mix of camaraderie over lunch or dinner and the outcome is, eventually, many leaps ahead in the fight against rabies.

The 1995 host of the Rabies in the Americas meeting, the Pan American Health Organization is already looking forward to the next conference in Mexico City.

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The Rabies Reporter, a scientific newsletter about current issues in rabies research and control, is a joint effort of the Rabies Research Unit, Ontario Ministry of Natural Resources; the Food Production and Inspection Branch of Agriculture Canada; The Ontario Ministry of Health and the Department of Geography, Queens University, Kingston.. Articles for future issues will be welcomed by the editor. Comments, letters, submissions and enquiries should be sent to:

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Animal Rabies Report: October to December 1994

Animal Type	Fox			Skunk			Other Wildlife			Dog			Cat			Livestock			Total		
County or Area	#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative	
		94	93		94	93		94	93		94	93		94	93		94	93		94	93
Eastern																					
Stormont																			0	0	0
Dundas			1																0	0	1
Glengarry						1													0	0	1
Prescott			3		1	1			1							1	2	1	1	3	6
Russell																			0	0	0
Carleton							2	4	1							1	1		3	5	1
Renfrew						1													0	0	1
Lanark								1	1										0	1	1
Grenville																			0	0	0
Leeds									2										0	0	2
Frontenac							1	1											1	1	0
Lennox-Addington									3										0	0	3
Hastings		2	8		2		3	3		5	2				1		9		2	27	8
Prince Edward																		1	0	0	1
Northumberland			1	2		2		1	2		1								0	5	5
Victoria		0	2	14	6	15		8			3			1	2		1	1	8	20	25
Haliburton																			0	0	0
Peterborough			6	20	2	13		19		3	3					2	1	2	3	24	47
Durham		1	11	53	3	7		16			5	1	1	2		2	1	4	8	23	86
York Region			6	36	2	10		11					1	2		1	1	10	2	18	60
Scarborough				1															0	0	1
East York																			0	0	0
City of Toronto																			0	0	0
City of York																			0	0	0
North York							1		1										0	0	2
Etobicoke																			0	0	0
Simcoe			2	23	1	1		10		3	3			3				6	1	6	48

Animal Rabies Report: October to December 1994

[illegible]

Animal Rabies Report: October to December 1994

Animal Type	Fox			Skunk			Other Wildlife			Dog			Cat			Livestock			Total		
County or Area	#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative	
		94	93		94	93		94	93		94	93		94	93		94	93			
Thunder Bay																			0	0	
Rainy River							1												0	0	
Kenora																			0	1	
Subtotals																					
Eastern			4		1	3	3	6	8							2	3	1	5	10	
Central	3	36	151	14	51	69		12	19	1	5	7	1	2	9	3	17	28	22	123	
Western	13	121	278	27	57	84	2	8	5	6	8	4		16	35	21	55	117	69	265	
Southern	10	90	244	11	33	28	3	9	14	3	9	11	9	26	42	6	31	47	42	198	
Northern		7	15			3		1	2	1	1	3					1		1	10	
Totals	26	254	692	52	142	187	8	36	48	11	23	25	10	44	86	32	107	193	139	606	
																					1231

Livestock this quarter: 26 cattle; 2 goat; 4 sheep, TOTAL LIVESTOCK THIS YEAR: 89 cattle, 8 horses, 16 sheep, 4 goats.:

Other wildlife this quarter: 2 coyote, 2 raccoon, 4 big brown bat.. TOTAL THIS YEAR: 14 big brown bat, 14 coyotes, 6 raccoons, 1 little brown bat, 1 red bat.

