

The Rabies Reporter

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In this issue:

- Rabies Unit Amethyst Award
- Rabies in Ontario - 1998
- Texas Operation - 1999
- Communications with a Bite
- Rabies in New York - 1998
- Rabies in Ohio - 1998
- 1998 Was a Good Year All Around

RABIES UNIT AND AIR SERVICE PARTNERS WIN AN AMETHYST AWARD

The Amethyst Awards are given annually by the Ontario Government to recognize excellent performance by members of the Ontario Public Service. Among the 27 awards made in 1998, including a record 7 to members of the Ministry of Natural Resources, was an award to the Rabies Research Unit - Air Services team, for their role in virtually eliminating fox rabies from Ontario. Four members of the group, Neil Ayers, Peter Bachmann, Charlie MacInnes, and Rick Rosatte accepted the award, on behalf of a broad and varied team. It was presented by Premier Mike Harris and Management Board Secretary Rita Burak (the senior among all civil servants), at a ceremony in Queen's Park on 8 December.

It was an interesting experience to stand among provincial forest fire fighters and other teams who were cited for their roles in helping eastern Ontario recover from the great ice storm, financial superstars, and a variety of other teams who were selected for awards by a committee from outside the government, based on nominations received. The Rabies Research Unit sincerely thanks Bruce Pond, who sponsored the nomination, and

Derek Pinto, who helped. We in the Rabies Unit hope we can continue to live up to the high ideals stated in the citation.

Trophies will be displayed at Trent University, and at the Sudbury Air base.

Charlie MacInnes
Rabies Unit
Trent University

RABIES IN ONTARIO 1998 ANNUAL SUMMARY

There were 4 rabid foxes encountered in southern Ontario during the year, compared to 6 last year. In like manner, there were 33 rabid skunks, down from 39 last year, making 1998 a year of slow change in the rabies situation. As a matter of interest, I

looked up the totals for 1988, a decade ago, when there were 936 rabid foxes and 447 rabid skunks. Since 1988 was a year before the first large-scale bait program, rabies has been substantially reduced by the control program. The extent of the decline in overall rabies is clear in Figure 1. The role of the bait program shows on the graph in the form of two steep declines, to the very low levels we have now

How can we assess what the slow rate of decline from 1997 to 1998 means with respect to the ultimate goal, complete elimination of the Arctic fox strain of rabies from eastern Ontario? If we remove the 30 rabid bats, and one vaccine-induced case (see below), there were 47 cases of Arctic fox rabies, in all species, in southern Ontario, during 1998, down slightly (16%) from 57 cases a year earlier. The ERA vaccine in Ontario baits is

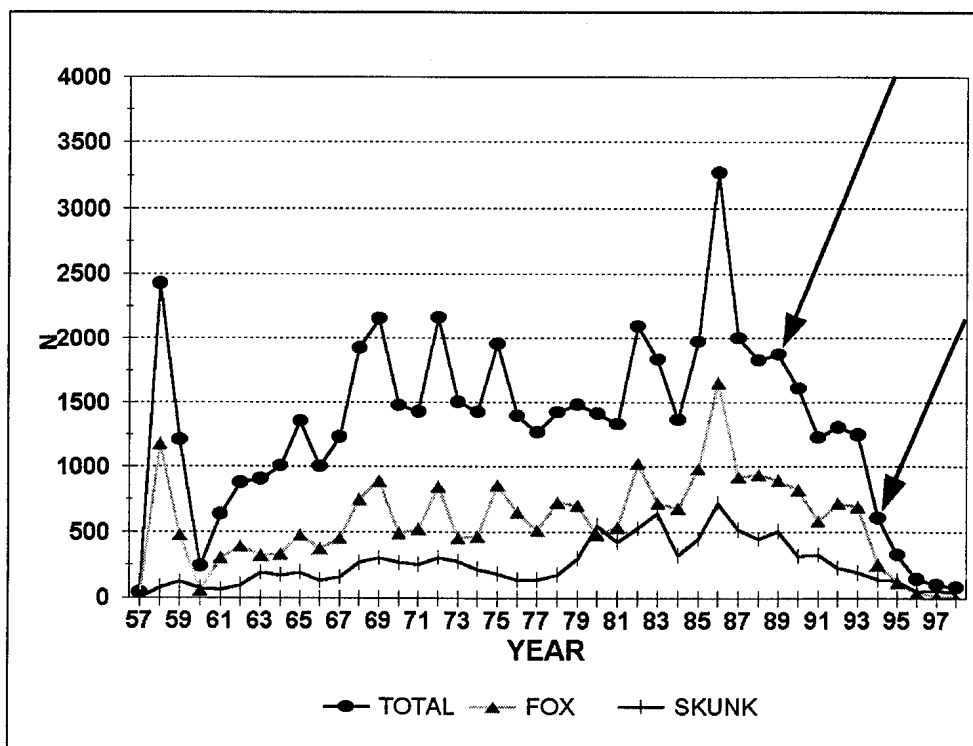


Figure 1. Annual totals of all rabid animals, rabid foxes and rabid skunks in Ontario. The two black arrows show when, first, the bait program began in eastern Ontario in 1989, and second, when, in 1994, it was expanded to cover the whole of southern Ontario.

effective in foxes, but not in skunks by the oral route. Therefore, we must wait for rabies to die out naturally in skunks, while keeping the foxes vaccinated so that skunks will not re-ignite rabies in fox populations. In eastern Ontario, rabid foxes used to outnumber rabid skunks by roughly 5 to 1. In some areas of western Ontario, the ratio was close to 1:1. And it is now clear that it is in precisely those areas where skunks were always important to the rabies cycle that rabies is hanging on in the skunk population. A year ago there were 2 or 3 areas of concern: Perth - Grey - Bruce - Huron, Waterloo - Wellington - Dufferin, and Scarborough - Durham - Victoria - Peterborough. Rabies in the latter area has dropped from 12 skunks and one fox in 1997 to 4 skunks and 1 fox in 1998. The other two areas show on the annual summary map as a single outbreak. Waterloo-Wellington-Dufferin had 14 rabid skunks in '97, and 11 in '98. The other area was up from 11 to 18 cases, and had 3 foxes in '98. I believe it is very significant that all 4 of the rabid foxes in 1998 were found within or close to areas where there was still rabies in skunks. That suggests the likelihood that all of the foxes may have been infected by skunks.

There was a very tense day in the Rabies Unit when, on 20 October, we received a telephoned report of a rabid raccoon in Grey County, near Hanover. Was this the dreaded hitchhiker, bringing raccoon strain rabies into Ontario. The next day we breathed a sigh of relief, when the news came from ADRI that the virus was ERA, so the raccoon had been infected by one of our baits. This was the eighth case of vaccine-induced rabies since 1992. There have been, widely spread over the years and the baited areas, three foxes, two skunks, two raccoons and a calf infected by the vaccine in the baits. This underlines the need to continue to encourage the public to leave the baits in place, to reduce the possibility of contact with the vaccine. It is not easy to explain that the vaccine is neither

100% safe, nor always unsafe, but that a very few individuals have the possibility of reaction to it. We believe that tens of thousands of foxes, hundreds of thousands of raccoons, and a few thousand skunks eat baits each year: therefore, the risk per individual is extremely small, but not zero.

There was a rabid dog in Brampton during the last quarter. From verbal reports I received, this was a large dog, it became very aggressive, and attacked several people in the neighborhood of the owners' home. The incident underlines the need to maintain vigilance about pet vaccination. There is still rabies in the environment, even if it is much less than a decade ago.

Rabies in bats was a concern this year, as indicated in the last issue. However, the total number of cases was well within the range experienced in the last 20 years.

Overall, then, rabies totals continued to slide towards oblivion, except for bats, which are unaffected by the oral vaccination of terrestrial species. We would like to stop baiting after the 2001 drop: if that is to be achieved, the last rabid skunks will have to be in 1999. We have set a goal that baiting will be discontinued two years after the last rabid skunk. The coming year will be interesting.

*Charlie MacInnes
Rabies Research Unit
Trent University*

THE 1999 TEXAS OPERATION WAS A GREAT SUCCESS!!

The 1999 Texas ORVP concluded in the early afternoon of Sunday January 31, after 28 days of vaccine distribution. The following is a list of significant achievements accomplished by the 1999 volunteers that made the vaccine distribution possible:

1. A total of 2.7 million doses of Raboral V-RG, oral rabies vaccine were distributed over 34,000 square miles of South and Central Texas.

Of that total 1,055,000 doses were distributed in South Texas and 1,700,000 doses were applied to the perimeter of the affected areas of Central Texas.

2. The 1999 South Texas program was reduced from almost 22,000 square miles treated in 1998 to 15,000 square miles in 1999 because of the absence of rabies cases reported from the northern counties in the epizootic area.

3. The areas in Brooks, Cameron and Willacy Counties that reported the last 5 rabies cases in South Texas received a vaccine density level of 140 doses per square mile or twice that normally applied to the epizootic area.

4. Approximately 30,000 doses of Coyote vaccine (fish meal based bait) were applied to an area in Callahan County where cases of coyotes with the Grey Fox strain of the rabies virus were reported in 1998.

5. A ceremony to acknowledge the program and encourage continued cooperation at the State, Federal and International level was held in Kingsville. Participants included Dr. Archer, Dr. Patterson, Dr. Simpson, and Dr. Pendergrass from TDH, Dr. Dominguez the Zoonosis Officer for Mexico, John Snobelen the Minister of Natural Resources from Ontario, Gary Nunley and Martin Mendoza from Wildlife Damage Management Service, General Wayne Marty, Commander of the Texas Army National Guard, and General Baker, Commander of Troop Command of the Texas National Guard.

I would like to extend a special thanks to the volunteers that worked to make the 1999 program the most logistically successful so far. The fact that 2.7 million doses were distributed in record time was only possible because of their hard work. Weather in Texas in January was mostly clear but we experienced many days with very high winds making flying extremely uncomfortable for those people that worked in the aircraft. There were few complaints and I thank you for your

commitment to the program and your understanding of how important it is that we work as a team.

I would also like to thank the people who kept the offices going in Austin and the Regions during our absence. This year has been especially demanding with the legislative session and Exceptional Items request. Thanks to those folks who wrote the reports and made the maps to help us fight for next years funding while we were gone.

Dr. M. Gayne Fearneyhough

Director

Oral Rabies Vaccination Program

Zoonosis Control Division

Texas Department of Health

Austin, Texas

Chief Pilot's note:

Aviation Services in general played a very large part in ensuring these achievements happened. The professionalism and dedication of Pilots, Engineers, Avionics, and Rabies Research crews made for a safe and efficient operation. The tremendous support from Aviation Stores, Administration staff and those who took up the slack, certainly are to be commended.

And to the families who kept the home fires burning, THANK YOU.

Once again a tip of the "ol' stetson" to all AVIATION SERVICES STAFF.

The Coordinator, Rabies Research, adds:

The Ontario team arrived home from Texas on 1 February, a full week earlier than expected. I want to thank Andrew Silver, Kim Bennett and Mark Gibson, who were the Rabies Research Unit's representatives this year.

It is an honour and a pleasure to participate in this ambitious and successful program in Texas. As Dr. Fearneyhough's article makes clear, the Texas operation is a large one, involving several cooperating agencies and organizations. It runs smoothly because it is well organized, but also, and chiefly, because everyone who participates is dedicated to helping the pro-

gram succeed. The Texas spirit is wonderful!

COMMUNICATIONS WITH A BITE !

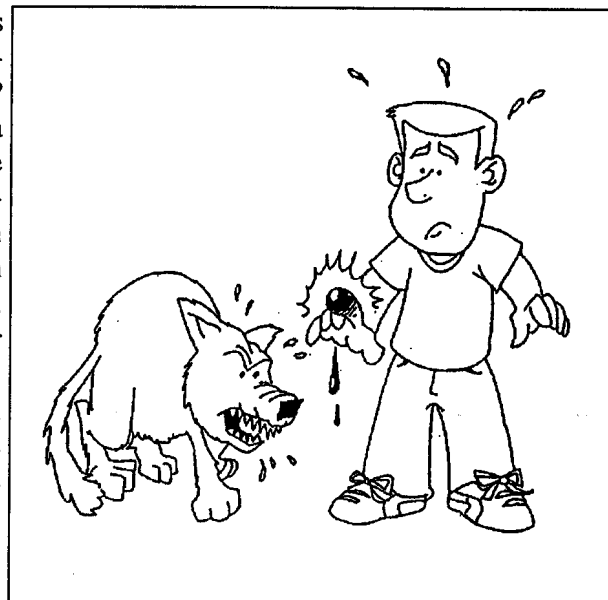
After 10 years of aerial baiting and over 30 years of public education on rabies, what messages could possibly be left to communicate to the public? Although rabies has been a health concern in the province for over 40 years, and communications around rabies, in varying degrees, have been around for almost as long, there is still a pressing need for communications.

1998 saw an increase in the number of calls to the phone number printed on the baits. Almost half of the callers were calling for general information while 1/3 were calling about pet and livestock contact with the baits. The most delicate of calls came with concerns of people coming into contact with the baits, especially after their dog had bitten into the vaccine package and subsequently licked the owner(s).

Although the risks to humans, in these instances, are extremely low, there is no way to guarantee that there will be no reaction resulting from the consumption of the vaccine. So, all humans that come into contact with the baits are given post-exposure treatment. Post-exposure treatment is to be avoided because of the disruption to people's lives and the cost to deliver the shots. People must be aware of potential risks of handling the baits, or, at the very least, be aware of the aerial baiting program and what the white piece of fat and wax their dog is chewing might be (it is difficult to read a phone number on a masticated bait). But what is the level of public knowledge on the aerial baiting program now?

Studies in the province of Ontario on public awareness of rabies, of control programs, or the effectiveness of current communications initiatives have been limited. Nonetheless, some areas that require communications are reasonably simple to discern.

We can assume that the burst of



multimedia communications that occurred throughout the late 1980s and early 1990s had some positive effects. However, the target population of these educational efforts have moved well beyond primary school. We have a new generation of children to educate.

Furthermore, the issues have changed, thanks to the successes of the Rabies Unit. As the incidents of fox rabies diminish, bat rabies draws an increasing relative sphere of social concern. Add to this the fact that the majority of cases of deaths due to rabies in North America in recent years have been due to bat variants of rabies, not raccoon or fox rabies, and we have a critical and previously-minimalized focus for public education.

The forums for the dissemination of information available today are vast, efficient and cost-effective. The Internet is, of course, at the top of this list. Many schools and health centres have access to the Internet. These can be used as distribution points for the information. A fast, efficient, cost-effective and environmentally-friendly

'print-on-demand' distribution method is encouraged.

The second target audience are rural residents. This group presents perhaps a greater challenge. Yet, their inclusion is essential because baits are dropped in rural areas. Farm shows? School visits? Radio? Television? Video? All of these are options, yet the cost of most of these is considerably high.

Whatever the method, one thing is definite. Communications has to continue to be in forms that are accessible and appealing to the general public. Simple, concise and entertaining - communications with a bite!

Communications by the Rabies Unit have been hindered in the recent past by staff changes. I have put together, in one large table, a yearly schedule of communications needs, which I am pleased to see on several bulletin boards in the Unit. This should help get the messages out in a timely way through the year. Until I participated for a year, I had no idea that there are so many needs to make the public aware of upcoming T-V-R and bait drop programs, plus the operations in Texas, Ohio, New York, Vermont and Quebec. This is a big, complex program, with a lot of communications needs.

*Derek Pinto
Information Officer
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Peterborough*

RABIES IN NEW YORK STATE 1998 ANNUAL SUMMARY

This was the eighth consecutive year in which there were more than one thousand laboratory confirmed rabid animals in New York State. The raccoon-vector outbreak that has affected the state since 1990 accounted

for 90% of the cases, and yet, it was rabies in bats that resulted in record breaking numbers and the most perplexed public health issues.

There were 10,881 animals examined for rabies infection in the state during the year, a 5% increase over the 1997 figure. The Wadsworth Center rabies laboratory examined 9,866 and the New York City Health Department laboratory examined 1,015. Specimens included 57 different species of mammals, with samples originating from each of the state's 62 counties. The largest category of animals examined was bats, comprising 28.9% (3,141) of all specimens received. This was the greatest annual total of bats tested in the state, and represented an increase of 32.6% from the 1997 total and nearly twice the average for the previous five-year period (1,631). The laboratories also examined 2,283 domestic cats which comprised 21.0% of all animals tested, as well as 2,180 raccoons (20%), 961 dogs (8.8%), 696 skunks (6.4%), 626 rodents (5.8%), 224 foxes (2.1%), 169 cattle (1.6%), 468 other wild (4.3%), and 133 other domestic animals (1.2%). Among all animals received at the Wadsworth Center for rabies examination, 23.4% had reportedly bitten one or more persons, 22.2% had some other non-bite human contact, 31.3% had contact with one or more domestic animals, and 33.2% were non-contact surveillance specimens.

Rabies was diagnosed in 40 domestic animals during the year, accounting for 3.6% of all cases. This was the first time since 1989 in which there were no rabid dog in the state. The 27 rabid cats was more than double the total of other rabid domestic animals combined, 28.6% greater than 1997 total (21), but 12.9% fewer than the average for the previous five year period (31). Other rabid domestic species included 8 cattle, 4 horses, and 1 ferret. There was one previous rabid ferret in New York State, reported in 1995. One of 1998's rabid horses became infected with the raccoon variant

of rabies virus, despite current rabies vaccination (two annual doses). Because the exposure went unrecognized, the animal did not receive a postexposure booster vaccination. Such vaccine failures are rare. Nevertheless, this case is a strong reminder of the importance of the booster vaccination that is required within five days of a rabies exposure for a currently vaccinated animal. It also demonstrates the need to rule out rabies in biting animals by 10 day observation or testing, despite current vaccination status.

Among all animals received, the rabies positivity rate (rabid/tested) was 10.1%. The positivity rate among raccoons received was 31.6%, among skunks it was 28.2%, and for cats it was 1.2%. Among all rabid animals, 22.1% had reportedly bitten or scratched a human. Of the rabid raccoons, 14.9% had reportedly exposed a human. Remarkably, among the 40 rabid gray foxes, 70% (28/40) had reportedly exposed a human by bite or scratch. Of the 22 gray foxes received that were known to have actually bitten a human, 95.5% (21) were found to be rabid.

The raccoon rabies outbreak spread in the newly affected areas mainly at the epizootic front in St. Lawrence County, where the disease was reported in raccoons in 12 new towns during the year. The outbreak was very intense in the affected areas of the county: 140 terrestrial animal cases were reported, with only half of the county affected by the end of the year. Statewide, the outbreak affected 403 towns in 53 counties - only Franklin and Hamilton counties in the North, Suffolk and Nassau counties on Long Island, and Kings, Queens, Richmond (Staten Island) and New York (Manhattan) counties were free of reported terrestrial rabies during 1998.

The 110 rabid bats confirmed in the state eclipsed by 31.0% to previous annual record of 84, recorded in 1990. This record number of rabid bats and the record number of bats received testing (3,141), reflect the

implementation of the modified national and state bat encounter guidelines. It is now recommended to capture and test bats encountered in many common circumstances, even in the absence of a recognized human exposure. The recent emphasis of rabies control programs on bat rabies and liberalized postexposure treatment guidelines were substantiated during the year by another human rabies death from a bat rabies variant, in the absence of a recognized bite. This death, which occurred in Virginia on December 31, brings to 20 the total of human rabies deaths attributed to bat rabies in the United States since 1990.

The overall positivity rate among bats examined in the state was 3.5%. It is noteworthy that this is not significantly different from the 1997 positivity rate among bats (3.4%), or the average for the previous five-year period (3.7%), or the average for the 17 year period 1981-1997 (4.0%). Once again, the big brown bat accounted for the vast majority of rabid bats and had a much higher total rabid (89) and positivity rate (4.6%) than the other common house bat, the little brown bat (11, 1.2%). Other rabid bats included 4 hoary bats, one silver-haired bat, one Keen's bat, one red bat, and 2 bats unidentifiable to species. Rabid bats were geographically widespread during 1990 with at least one case reported in 83 different towns in 37 of the state's 62 counties. Among all bats received at the Wadsworth Center for testing, 4.5% (140) had reportedly bitten a human, 15.2% (471) had some non-bite human contact and 29% (900) had contact with one or more cats. Among the rabid bats 10.9% (12) had reportedly bitten a human, 15.5% (17) had some non-bite human contact, and 22.7% (25) had contact with one or more cats. Of all bats received, 53.9% were male 40.7% female and 5.4 unidentified as to gender. Among the rabid bats 34.2% were male, 60.7% were female and 5.1% were unidentified as to gender. There were three rabid juvenile bats identified among

129 examined, for a rabies positivity rate among juvenile bats of 2.3%.

Monoclonal antibody analysis was performed on 171 samples during the year, including rabid bats, domestic animals and cases in unusual species or locations. All wild terrestrial and domestic animals analyzed and were found to be infected with the raccoon rabies variant of rabies virus, and all bats analyzed were infected with one of four bat rabies variants commonly identified in insectivorous bats of the northeast. The silver-haired/pipistrelle variant, implicated in most human cases in the U.S. since 1990, was identified only in the one rabid silver-haired bat analyzed. The Wadsworth Center rabies laboratory also performed rabies serologic assay for rabies antibody on 2,003 human samples during the year. The vast majority of these tests (89%) were done to determine the timing of booster vaccination. Fourteen human serum samples were tested (all negative) as part of the anti-mortem examination for rabies in patients with encephalitis of undetermined etiology.

New York City Health Department Laboratory data provided by Dr. Igbal Poshni.

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Wadsworth Center Rabies
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OHIO 1998 ANNUAL RABIES SUMMARY

Ohio experienced a less traumatic year in the rabies arena during 1998. Overall, 59 animals were confirmed positive for rabies, compared to 116 in 1997. There were 20 confirmed positive raccoons in 1998 (33.9% of the total positive animals) compared to 59 confirmed positive raccoons in 1997. The 1998 raccoons were from Columbiana, Mahoning and Trumbull Counties, the same three counties that reported the 1997 positives. Bat rabies

cases dropped from 52 in 1997 33 in 1998. Other species found positive in 1998 included three skunks, two cats, and one fox, all of which were raccoon-strain from Northeast Ohio. A map is attached showing positive animals for these animals for the last two years.

Eighteen of the confirmed positive raccoons were reported through June 25, 1998. No positive raccoons were reported from June 26 to November 15, with a positive raccoons then reported from Columbiana County. The last positive raccoon rabies case in 1998 was reported from Trumbull County on December 30.

In 1997, 4.71% of the submitted bats were positive (52 positive out of 1,104 bats tested), compared to 1998, when 3.89% of the bats were positive (33 positive of 840 bats tested). The positive bats resulted in 24 humans receiving rabies post-exposure treatment series. Three dogs and three cats were also exposed. The percentage of positive bats in laboratory submissions does not reflect the actual percent of bats that are rabid in the general population. Most bats submitted for testing have demonstrated unusual behavior or were otherwise paralyzed or weakened, typical of rabies. In the healthy bat population, we expect much less than 1% positive for rabies. However it is important to remember that bats demonstrating unusual behavior offer more chance for contact with humans and animals.

In 1998, not only did cases of raccoon rabies decline, but so did the percentage positive. In 1997, 3.48% of raccoons submitted were rabies positive (59 positive of 1,697 raccoons tested), while in 1998, 1.20% of the submitted raccoons were rabies positive (20 positive of 1,673 raccoons tested). The large number of raccoons tested is primarily due to the ongoing surveillance efforts being conducted in 12 counties in northeastern Ohio. These 12 counties submitted 1,200 of the 1,673 raccoons tested (71.7%) in 1998. The positive raccoons resulted



Positive Raccoon Strain Rabies 1998

20 Raccoons
3 Skunks
2 Cats
1 Fox

26 Total Cases

TOTAL BAITS DROPPED

725,501 baits total

576,720 by airplane

113,495 by ground

35,286 by helicopter

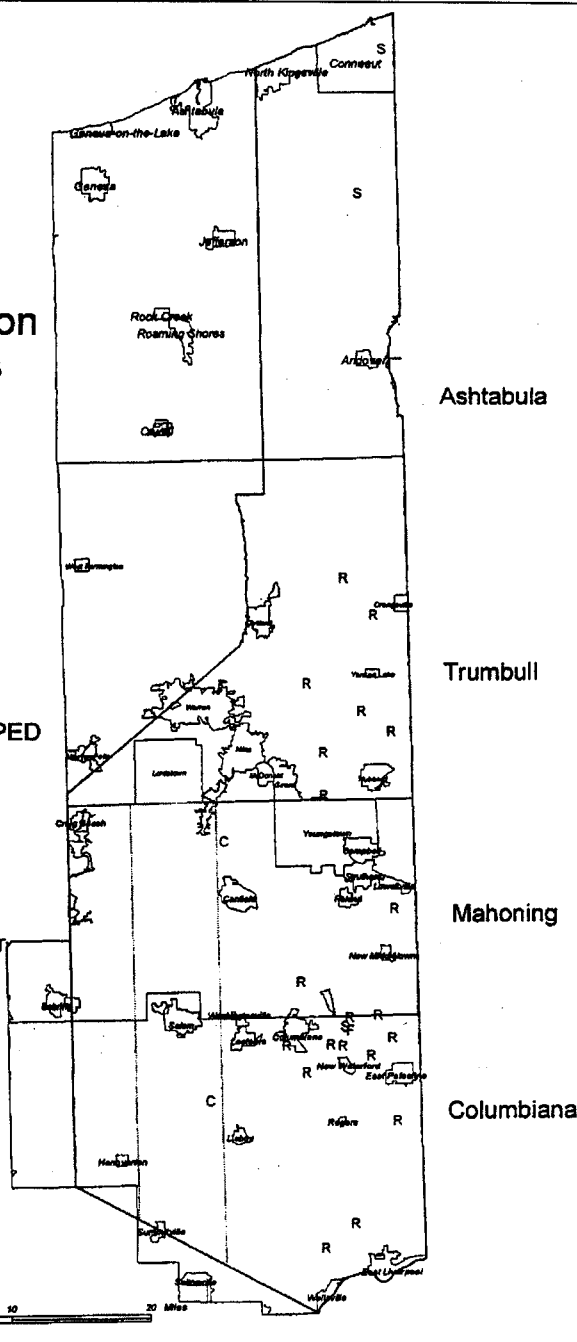
Next planned baiting:

the week of 4/11/99

R = 20 Raccoon Positive
F = 1 Fox with Raccoon Strain Rabies
S = 3 Skunk with Raccoon Strain Rabies
C = 2 Cat with Raccoon Strain Rabies

Area Baited
Spring 1998 100km
Ashtabula Cities
Ashtabula County
Columbiana Cities
Columbiana County
Mahoning Cities
Mahoning County
Trumbull Cities
Trumbull County

0 10 20 Miles



in exposure to one person, seven dogs and two horses. The human received rabies post-exposure treatment. The dogs and two horses had current rabies vaccination, so they were re-vaccinated for rabies and quarantined for 45 days.

In 1998, three other species of animals were confirmed with raccoon-strain rabies, demonstrating how raccoon rabies readily spills over to other animal species. The two positive cats were from Mahoning and Columbiana Counties and were submitted for testing in February and March, respectively. One person was exposed in

each of the positive cats. In one case a feral cat bit a six-year-old boy, and in the other case, an unvaccinated free-roaming kitten bit its owner. Both received rabies post-exposure treatment.

The fox and one skunk were submitted just one week apart and were from adjoining farms in the New Waterford area of Columbiana County. Earlier in 1998, three rabies positive raccoons were also submitted from the New Waterford area. Three cows were put under a six-month quarantine by the Ohio Department of Agriculture because at least one cow butted the fox

and a bite contact could not be ruled out. Pets on the farm were either not vaccinated or not up to date on rabies vaccination. Since the pets had no known contact with the fox, they were not placed in quarantine. However, they were vaccinated for rabies at the time rabies was diagnosed in the fox. No human exposure occurred.

The other two skunks with raccoon-strain rabies were from Ashtabula County. They were laboratory confirmed in October and December. These skunks were the first documented raccoon-strain rabies cases in Ashtabula County and were not unexpected. The Conneaut skunk, found about one mile from the Pennsylvania border, exposed one person who received the rabies post-exposure treatment, and a dog, which was euthanized. The other rabid skunk was from Pierpont, about 2.5 miles from the Pennsylvania border. This skunk exposed seven dogs; two were euthanized and five were quarantined. It is unknown how these skunks may have been exposed - as no cases of rabid raccoons have yet been identified. A concern is that skunks may become an alternate vector for raccoon-strain rabies, because oral rabies vaccine (ORV) does not protect skunks.

It is important to remember that raccoon rabies is continuously at our door in the northeastern counties. Traditional rabies prevention interventions must be enhanced; educating the public to avoid wild and strange animals and vaccinate all their pets (cats as well as dogs). Physicians and the public must be encouraged to report bites or other exposures promptly to local health departments.

The only additional prevention tool we have in Ohio to combat raccoon rabies is the application of Raboral, an oral rabies vaccine (ORV) for wild raccoons. It is being used to establish an immune barrier to prevent this epidemic from spreading through the rest of Ohio. The vaccine, enclosed in a fishmeal bar, was distributed twice in 1997 and 1998. The targeted area

extends from Lake Erie on the north to the Ohio River on the south and includes Ashtabula, Trumbull, Mahoning and Columbiana Counties. It is at least ten miles wide and encompasses approximately 1,540 square miles. The vaccine-laden baits were distributed by vehicle in urban areas and by aircraft in rural areas. People from local health departments, Ohio Department of Agriculture, Ohio Department Natural Resources Wildlife Division, Ohio Department of Health, United States Department of Agriculture (USDA), Centers for Disease Control and Prevention, Texas Department of Health, The Ohio State University, Cornell University, and the Ontario Ministry of Natural Resources generously provided support to efficiently accomplish this task.

To evaluate our ability to orally vaccinate raccoons in the many different habitats of Northeast Ohio, live trapping of raccoons was conducted post-baiting. Raccoons were anesthetized, ear tagged, and blood was drawn. Over 400 blood samples were collected during the summer of 1998. Rabies antibody (an indicator of protection) was detected in approximately 32% of the raccoons. ODH is also aggressively monitoring for rabies cases. To date there have been no animals with raccoon-strain rabies found outside the ORV baited area.

As we finish the second year of the ORV implementation, we are cautiously optimistic, as spread of raccoon rabies has been checked and incidence has decreased significantly. But this novel approach to combat rabies is still somewhat experimental. Although a vaccine is effective, the optimum methods to utilize ORV in the field are still under study. Surveillance efforts, public education programs, and other rabies prevention initiatives

Dr. Kathy Smith

Public Health Veterinarian

Dr. Roger Krogwald

Assistant Public Health Veterinarian

Ohio Department of Health

Columbus, Ohio

1998 WAS A GOOD YEAR ALL AROUND !

The Texas and Ohio reports, as well as Ontario's, make it clear that Oral Rabies Vaccination is going well where ever it is being practiced. Both the Texas and Ontario programs have made enough progress that bait zones are being changed, in the mode of adaptive management, as rabies is cleared out of parts of the original areas. This was especially clear in Texas this year. As Dr. Fearneyhough has pointed out, the area was changed dramatically, but within the zone baited in January 1999, double the normal density of baits was applied in potential reservoir areas. The Ontario program made a larger foray into Quebec, in an effort to reduce the probability of re-invasion of our original eastern Ontario control area. There have been no further rabies cases in the area baited in Quebec, although it will be much more convincing if that can be said a year from now.

Raccoon rabies did not make it into either Ontario or Quebec during 1998. The failure to cross either the Niagara or St. Lawrence Rivers must be due partly to reduction of raccoon rabies by Oral Vaccination on the New York sides of both rivers, and also, perhaps, to the Trap-Vaccinate-Release campaigns on our own side. I say perhaps only because, until we have had one case within a TVR zone, and seen no further spread, will we be sure that the TVR zone played a real role. As stated in an earlier issue, however, detection of such a case is made difficult by TVR itself. If only one in ten rabid animals makes it into the lab (and one in ten is an optimist's ratio), then if a raccoon incubating rabies crosses from New York into one of our TVR zones, becomes rabid and fails to pass on the infection when it becomes rabid because all the raccoons it meets are vaccinated, the fact that raccoon

rabies made it into Canada will go undetected. We expect to see raccoon rabies in a newly-infected area only on the second or third passage, when there are several rabid animals out there in the wild.

Is the goal of complete elimination of terrestrial rabies from treated areas achievable? There is one qualifier to this: I believe that the treated area has to be large, perhaps with a diameter at least double the distance travelled by the 1% (or maybe 5%?) of vectors which disperse the farthest. In the case of raccoons, three captures of tagged raccoons from the Niagara TVR area indicate higher frequency of long-distance (>20 km) movements than the literature led us to expect. Our current recommendation is that a barrier for raccoon rabies should be at least 40 km wide, and preferably 50 km.

In the case of fox rabies, Ontario's eastern Ontario treated area was much larger than the minimum required. We began with a partial baiting in 1989. By 1993 rabies was almost gone, and we stopped baiting in 1996. There has been one rabid skunk in the whole treated area since we stopped baiting, and that was only 6 weeks after the last bait campaign. An intriguing question is: what would have happened if we had stopped baiting in 1995? The risk of rabies reappearing would have been greater, but enough to make a difference? What I mean is that an increase from 1 chance in 10,000 that rabies will return to 1 in 1,000 still leaves the expectation that the return of rabies would be highly unexpected.

Of course we wish that raccoon rabies had not broken through the Jefferson County barrier in New York, but, on the other hand, the Niagara County attempt to stifle raccoon rabies at its height is going well. There were eight rabid raccoons in Niagara County during 1998, compared to 24 in adjacent Orleans County, which is the untreated experimental control area, immediately to the east of the treated area, and 30 in Erie County, which lies to the south of Niagara County. So Oral Vaccination

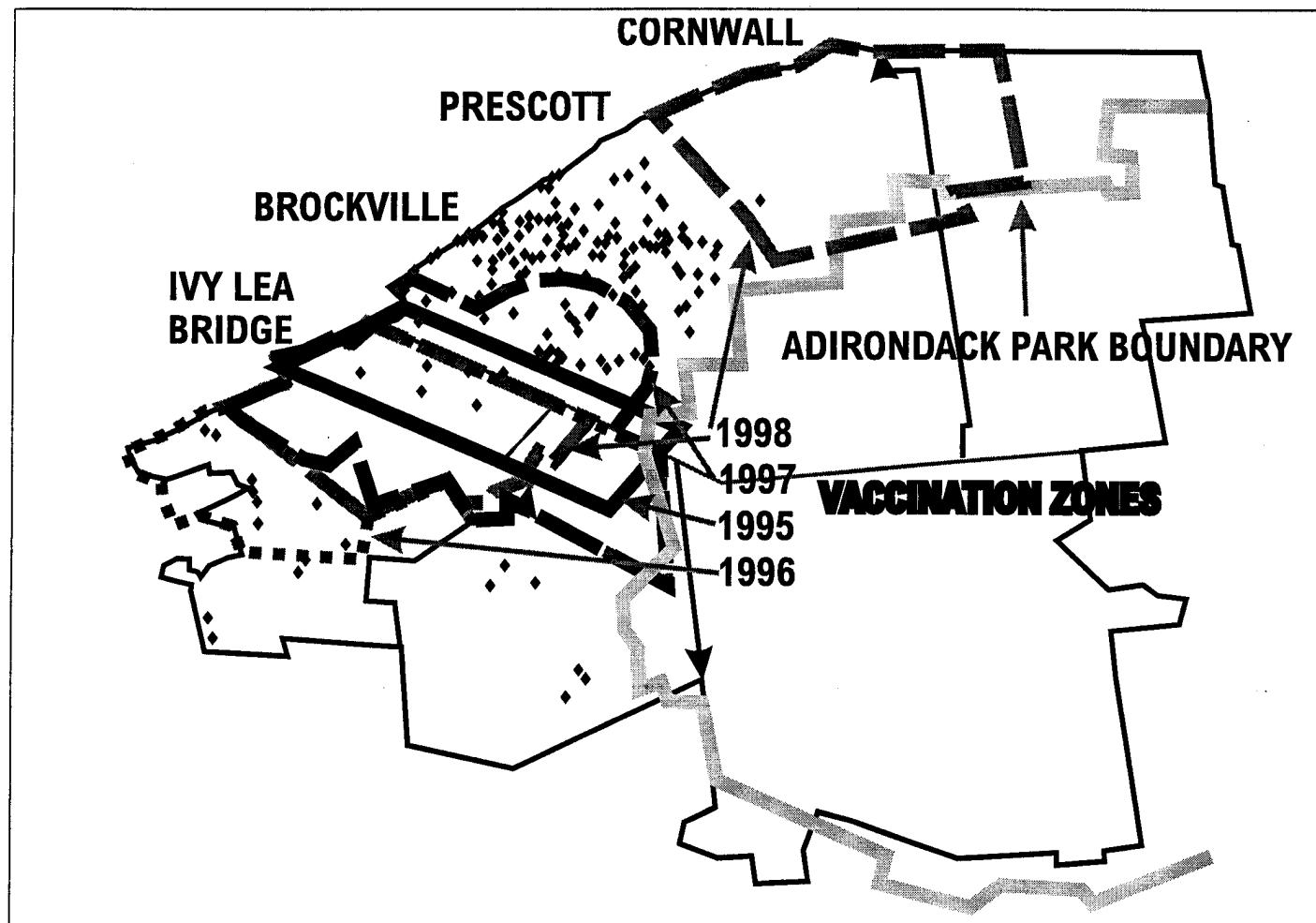


Figure 1. Map of 1998 raccoon rabies cases in Jefferson and St. Lawrence Counties, in northern New York, along the St. Lawrence River. The four vaccination zones are shown, but are so superimposed one upon the other that it is hard to distinguish some boundaries. Each diamond symbol depicts one rabid animal. Note the scarcity of rabies cases in areas that were treated in 3 or 4 years.

has not yet eliminated raccoon rabies completely from Niagara County, but it has certainly cut it down.

Figure 1 shows the situation along the St. Lawrence in New York State. Even this shows that ORV is reducing the density of raccoon rabies cases, albeit by less than we hoped. Look at the areas which were treated in three or four years: there clearly were many fewer cases therein during 1998. Note that the second wave of rabies was building to the south and southwest of the treated areas, but cases appeared scarcer in adjacent vaccination zones, although there are too few cases in the unvaccinated zone to hope for

statistical significance. The new outbreak, to the east and north of the 1997 vaccination zone, was intense during the year. The new "wall", to the east of that outbreak, has so far had only one case. We hope there will not be more next year.

The news from Vermont is also good: there has been no spread northward into the heart of the vaccination zones.

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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 1998

[illegible]

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[illegible]

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Animal Type	Fox				Skunk				Bat				Dog				Cat				Livestock				Total			
County or Area	#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative					
		98	97		98	97		98	97		98	97		98	97		98	97		98	97		98	97	98	97		
Northern (continued)																												
Thunder Bay																												
Rainy River																												
Kenora																												
Subtotals																												
Eastern									9	10														0	9	10		
Central		1	1	2	4	11	1	12	2															3	17	14		
Western		3	3	9	29	25	0	1	3	1	2	1		1	1		8	7	10	44	40							
Southern			2			3	2	8	10						2			3	2	8	20							
Northern			10																					0	0	10		
Totals	0	4	16	11	33	39	3	30	25	1	2	1	0	1	3	0	8	10	15	78	94							

Livestock this quarter: None

Bats this quarter: 3 big brown

Other wildlife this quarter: 1 raccoon in Grey (ERA, see text)

