THE BRODIE CLUB

ROYAL ONTARIO MUSEUM OF ZOOLOGY

THE 1013TH MEETING OF THE BRODIE CLUB

The 1,013th meeting of The Brodie Club was held at 7:30 p.m. on September 18, 2007 in the Ramsay Wright Laboratories of the University of Toronto.

Chairman: Bruce Falls
Secretary: Ed Addison

There were 24 members and 4 guests.

- Ed Bousfield, guest of Bruce Falls
- Richard Joos, guest of Fred Bodsworth
- Andrew Jano, guest of Ken Abraham
- Jeremy Hussell, guest of Rosemary Addison

Ron Tasker moved adoption of the previous minutes, seconded by Bill Crins.

NEW BUSINESS:

- Elections for all positions will be held at the October meeting. All volunteers will be welcomed with open arms.
- Eminent zoologist Ed Bousfield has recently moved to the Toronto area from his home in British Columbia and would like to join the Brodie Club. He has spoken to the club twice and has attended at least three meetings. He is sponsored by Bruce Falls, who was his classmate as an undergrad. His biography is attached below.
- Bruce Falls passed on a note from Louise Herzberg about a missing Brodie portrait. I have reprinted the letter in full.

> I just found out some shocking news yesterday which I am sure the Brodie Club should know about. As you know, there were two portraits painted of Brodie, one of which hangs in the ROM's Ornithology Department and the other one in the U. of T.'s School of Dentistry. I went down to the Dentistry School yesterday to see the portrait again. At first no one seemed to know of the portrait at all, but a phone call was made to Anne Dale. She helped we a lot when I was writing about Brodie. She called me yesterday morning with shocking news. The Brodie's portrait was stolen in December 2001. Stolen! How many people even know about Brodie?
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> Both portraits were painted by Owen Staples and in 2001 an article appeared in one of the newspapers about Staples. Anne Dale cut it out and pasted it up beside Brodie's portrait. One day she happened to be in the room where the portrait was kept. A man was reading the article about Staples and she asked him if she could help him. He brushed her off, but later said to her why aren't you keeping this valuable portrait in an alcove. This struck Anne Dale as odd expression. It was that day the portrait was stolen.
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> I am sorry to bring this news to the Brodie Club's attention. Louise Herzberg.

- George Bryant has joined the board of the Toronto Field Naturalists Club. Unfortunately, they meet on the third Tuesday of the month, affecting his atendance at the Brodie Club for the next three years.
- Speakers for future meetings include member Jean Iron, who will speak on Southbound Shorebirds and Jim Bendell with a title that has yet to be specified.
- A special thanks to Ed Addison who jumped into the breach on short notice and produced an excellent set of notes.

SPEAKERS

It was members' night and the following presentations were made:

Red Knot Research Trip to Mingan Archipelago, P.Q. – Jean Iron

The research is being conducted by the Canadian Wildlife Service [CWS, Yves Aubrey] and the Royal Ontario Museum [ROM, Alan Baker and Mark Peck]. Jean was a volunteer on the field research, 17 July to 7 August. They traveled by auto to Havre-St. Pierre east of Sept-Îsles. The archipelago comprises about 1000 islands. The researchers worked on the south shores of four main islands. These shores were exposed limestone and with the tide out supported thousands of tiny pools heavily populated with invertebrates. Half of the work was conducted during the day to achieve survey counts and half at night to trap birds for banding.

The primary objective was to count Red Knots. In April 2007, COSEWIC placed the *rufa* subspecies of the Red Knot on the endangered species list. About 10% of the Red Knots are tagged with bands and with flags of different colors. The colors denote the place of origin of the tagging. Observed birds had been tagged in Argentina, Brazil, Canada, Chile and a number of locations in the U.S. including Delaware Bay but excluding Florida. From later discussion it was suggested that Florida Red Knots may fly northwest across the continent to the western Arctic. The birds at the Mingan Islands nest in the Canadian Arctic.

In the 2006 season, the flags of 800 birds were counted whereas in 2007, over 1000 flags were counted. Daily counts of 1500-1800 birds in 2007 were estimated to comprise 7-10% of the total *rufa* subspecies of the Red Knot.

The knots were already moulting while staging. The plethora of food provided the energy for the two demanding processes of both moulting and acquiring fat for their southward migration. In addition to banding, linear measures, and description of the progression of moult, weight and blood samples [for DNA work] were taken. The heaviest Red Knot was 246 grams. In addition, tracheal and cloacal swabs were taken in a survey for avian influenza [AI] viruses since shorebirds are recognized as reservoirs for a variety of strains of AI. The examination of moult assisted in evaluating whether failed breeders arrived in Mingan before other segments of the population. There was no evidence of brood patches on any of the birds.

Of course, the field crew also observed a wide variety of other shorebirds attracted to this rich staging ground. Some other species included Black-bellied Plovers, Semipalmated

Plovers, Whimbrels, White-rumped Sandpipers, Hudsonian Godwits and more.

The first knot that they banded on the first night was still on the feeding grounds 15 and 18 days later.

More information on then trip can be accessed at http://www.jeaniron.ca/trips/Mingan/index.htm

Birding in Spain – Kevin Seymour

Kevin's trip was hosted by a Spanish scientist who had previously been toured around Ontario and had talked to the Brodie Club. The trip was from 27 April to 14 May, 2007. There were two trips, one to ecosystems south from Madrid and a second to the north.

Monfragű National Park

This is a 'hot spot' for vultures and eagles. Here they saw a gryphon vulture. Black storks are rare and breed here.

Ponana National Park

This was a salt marsh ecosystem in Andalusia on the south coast. It is a staging area for waterfowl and shorebirds. It is the last known locale of the Spanish lynx, one of the rarest cats in the world. Saw numerous species including collared pratincole and coots.

Pedro Munoz

This area in La Mancha is very different habitat being surrounded by agricultural lands. One species sighted here was the white-headed duck, a relative of the ruddy duck. Introduced North American ruddy ducks are the subject of an eradication program across Europe as they are hybridizing with the white-headed duck.

Picos de Europa National Park [northern Spain]

This is high country with snow still present in some areas. There are chamois in the area. There were wild, tiny narcissus only a few inches tall.

Ordesa National Parkin [in Aragon]

This area has been a park since 1918 and was originally set aside to protect the Spanish ibex, a species that is now extinct! The park is comprised of beautiful spectacular country. It is good hiking country. Kevin's group hiked in for a day through beech forests to some of the high alpine areas.

Ebro Delta [Catalonia]

This delta area attracts many shorebirds. Sightings were many and included squacco heron and black-winged stilt.

Layna Steppes [Aragon]

This was yet another very different ecosystem dominated by dry rocky hills interspersed with some cultivated fields. The area is known for 3 species of larks among other species.

Kevin saw 180 species of birds on the trip, 104 of which were seen by Kevin for the first time despite him having been to Europe on a number of previous occasions.

James Bay–Hudson Bay Field Work [and Alaska] – Ken Abraham

This work included Ken's annual survey for Canada geese, snow geese and shorebirds. It was an early season for the spring melt.

For the first time in 14 years on Akimiski Island, they saw Le Conte's sparrow. Also on the island this year were more American bitterns than in other years voles were present in much higher numbers than previously observed and were being predated upon by kestrels, foxes and gulls. One skull keyed out to Microtus pennsylvanicus. Ken saw 2 little gulls on Akimiski Island, the second year in a row for this species.

There are now 9 or 10 low islands that have appeared between Attawapiskat on the James Bay coast and Akimiski Island due to isostatic rebound and deposition. At least five have portions above water at all tides and these are very active colonial bird nesting areas. Birds observed included ring-billed, herring and great black-backed gulls (first nest of the latter was found in 2007); Caspian and arctic terns; cormorants; and pelicans but no evidence of a pelican colony. The double-crested cormorant colony went from 30 nests in 2006 to about 60 in 2007.

Ken described and showed a photo of an arctic fox den near the Brant River comprised of at least 30 holes and that was 60-70 m across. This den site had likely been used for a great many years.

Students from Queen's (Philina English and Mark Conboy) studied Smith's longspur at Burntpoint Creek in Polar Bear Provincial Park in 2007. Some birds were also banded. They then went on to Churchill. While 19 or 20 nests of Smith's longspur were located in the Churchill area, no nests were found in the Ontario habitats examined.

East of Winisk for the second year in a row were very large herds of caribou.

West of Cape Henrietta Maria there are numerous islands. Paul Prevett had counted about 80 common eider nests on one of these islands at the time of the first breeding bird atlas. No common eiders were seen by Ken at these sites this year. However, it was about 1 month after nesting that Ken was able to survey the area.

Ken briefly showed us pictures of glaciers at the headwaters of the Copper River in Alaska, an area to which he traveled in recent weeks. While most glaciers we hear of are receding, Ken noted that at least one of these glaciers (Childs Glacier) is advancing.

Ken also showed photos of trumpeter swans in flight and of a leucistic trumpeter swan at Harry Lumsden's property taken last winter.

Ken also reviewed some cooperative work with scientists from the USGS and USFWS to trap and band marbled godwits. They are exceedingly hard to catch. They can evade a net gun even when it is shot from as close as 5m! – 27 shots – no godwits! They eventually had limited success, catching one using a mist net and one using a noose matt. One of the birds migrated in late August from Akimiski, across Lake Superior, through South Dakota, Colorado and New Mexico. Its signal was lost on August 29, but it was thought to be heading for the Pacific coast of Mexico.

Odeing in Southwestern Ontario – Bob Curry

Bob and colleagues had a couple of field trips searching for Odonata. The first was on Big Otter Creek between Tillsonburg and Port Burwell. Paul Catling had found two 'new species locations' on Big Otter Creek in 1998.

On 1 August Bob and friends observed and photographed both of these rare species, Stylurus amnicola, the riverine clubtail and S. laurae [Laura's clubtail]. S. amnicola is also now reported from Big Creek in Norfolk County.

On 10 August, a trip to thew Sydenham River yielded they found some dragonflies known in Ontario only from this river. Dromogomphus spoliatus, is one species they saw for which this site is the only currently reported location in Ontario. They also observed Macromia taeniolata, another species unique to Ontario at this site. On Booth Creek, a tributary of the Sydenham River, they observed Somatochlora linearis (Mocha Emerald) another species new to Ontario in the last 10 years.

Habitats included 10-15m wide, sandy bottomed creeks for the species in Big Otter Creek and ephemeral water with shaded pools in the case of Booth Creek.

Monterey, California Seabird Trip – Sandra Eadie

Sandra had photos of the elephant seals at the rookery near the Hearst Castle. She went on a boat trip organized by Deborah Shearwater. They saw rafts of sooty shearwaters, one raft as large as the eye could see. They also saw black-footed albatross.

Sandra had pictures of a "mola mola", or oceanic sunfish, which basks in the sun on its side near the surface. They also saw the fin of blue shark and hump-backed whales. One hump-back "flapped" its tail 100 times. Four species of dolphins, including large pods of Pacific white-sided dolphins and right whale dolphins, entertained the passengers.

Rarer bird species seen were one flesh-footed shearwater, one manx shearwater, a few elegant terns and one northern fulmar.

Gulf Islands and Ottawa Valley Habitat Controversy – Jim Bendell

Unfortunately, we missed Jim's comments on the Gulf Islands.

The habitat controversy relates to the red pine monoculture plantations. Ther is little diversity in the pine monocultures as compared to the 'non-pine plantation" forest cover types. This applies to the fauna in addition to the flora. For example, in one survey there was one species of bird in the pine monoculture and 26 species of birds in areas with a more diverse forest coverage.

These monocultures are on Crown land.

What is the best solution? Should the plantations be logged to create patches or logged for thinning? If they are just thinned there will remain a dominant increasingly larger , number of red pines. If the sites are left as is, about 100-200 years into the future the red pines will fall down.

Australia and Panama – Jock McAndrews

Jock described being on ecotours in Panama and near Sydney and Cairns, Australia. He described hiking on Barro Colorado Island in Gatun Lake, part of the Panama Canal system, upon which grew seasonal tropical forest. He also described visiting a park in Panama City where there was a secondary seasonal forest surmounted by a construction crane. It lifts people into and above the forest canopy for 30 minutes of observation. He saw a tree sloth in the upper crown of a tree. The abundant gaps in the tree canopy were due to wind throw and rain loading; especially vulnerable were trees covered with vines.

Kirtland's Warblers - Paul Aird

Paul was back searching for Kirtland's warblers in the Petawawa area. They discovered a successful nest from which the pair fledged two nestlings. This was the first confirmed nest in Ontario. There was another individual male bird located some kilometers away but still in the Petawawa area. There were 8 signing males and 4 nests located in Wisconsin this year. These were the first confirmed nestings in Wisconsin. There were 1697 singing males on territory in Michigan.

In Ontario, males were known to be singing on territory in 1916, 1939,1946,1977, 1978, 2006, and 2007.

Northern Wheatears on Baffin Island – Jeremy Hussell

Jeremy reported that his father, David, spent five weeks during two separate trips banding northern wheatears. These birds breed in the eastern arctic of North America and migrate via Europe to winter in Africa. From the western arctic of North America, the wheatears migrate via Siberia to east Africa. David found 10 nests and banded 18 adults. This over half of all the wheatears banded in Canada. In the United States, there have been about 35 birds banded. Four thousand birds have been banded in Greenland with some of these banded birds recovered in Europe.

Show and Tell – Bruce Falls

In a previous copy of Brodie Club minutes, Yorke Edwards had mentioned that Bruce Falls had a box off of a gunsight that he had used as a monocular 'scope' for bird watching years ago. Bruce had it at the meeting. It appeared to be brass and was a 6 x 30 sight.

The meeting was adjourned at 9:42 P.M.

Annual Winter Finch Forecast

Ron Pittaway and Jean Iron offered Ron's annual winter finch forecast to those members' who haven't seen it. It is based on tree seed crops from across the province.

GENERAL FINCH FORECAST: 2007-2008

This winter's theme is "finches going in three directions" depending on the species. Some finches have gone east and west or both, while others will come south. Most coniferous and deciduous trees have very poor seed crops in much of Ontario and western Quebec. The exception is northwestern Ontario such as Quetico Provincial Park, Dryden and Lake of the Woods, where there are good crops on some species.

However, north of a line from the top of Lake Nipigon to Manitoba the crops are generally low in the boreal forest. This will be a quiet winter for most (not all) winter finches in Algonquin Provincial Park, in contrast to last winter's bumper seed crops and abundance of finches. Most of last winter's White-winged Crossbills and Pine Siskins departed Ontario this past summer. They probably went either to eastern or western Canada or both where there are bumper cone crops. Type 3 Red Crossbills, which were abundant in Ontario last winter, have probably returned to their core range in western North America. White-winged and Red Crossbills and Pine Siskins will not be irrupting south out of Ontario as they do in some flight years, because most have already gone east and/or west. However, other winter finches such as Pine Grosbeaks, Evening Grosbeaks, Purple Finches and redpolls are irrupting or will irrupt southward out of northern Ontario. See individual species accounts for details In addition I comment on other irruptive passerines, such as the Red-breasted Nuthatch, whose movements are linked to cone crops. Also included is a comment on northern owls.

INDIVIDUAL FINCH FORECASTS

Pine Grosbeak: This grosbeak will irrupt south of the breeding range because crops on native mountain-ashes (rowan berries) are generally poor in northeastern Ontario and across the boreal forest. However, crops are good in northwestern Ontario west of Lake Superior. Pine Grosbeaks should wander south to Lake Ontario and perhaps farther in search of crabapples and planted European mountain-ash berries, which have average crops in southern Ontario. Watch for them at feeders where they prefer sunflower seeds. After irruptions, Pine Grosbeaks return north earlier than other northern finches. Most are gone by late March. Buds form a larger part of their winter diet when mountain-ash crops are poor.

Purple Finch: Most Purple Finches will migrate out of Ontario this fall in response to the low seed crops. Currently, Purple Finches are migrating south through southern Ontario. Very few or none will stay behind at feeders in southern Ontario.

Red Crossbill: The Red Crossbill complex comprises 9 sibling Types, possibly full species, which have different call notes, and different bill sizes related to cone preferences. At least three Types occur in Ontario. Type 3 (smallest bill) prefers small hemlock cones (and spruce cones) in Ontario. The hemlock Type 3 was abundant last winter, but is presumed absent now from the province because hemlock produced few or no cones in 2007. Type 4 (medium sized bill) is adapted to white pine cones. White pine cone crops are fair to good (but spotty) in northern Ontario. Currently, small numbers of Type 4 Red Crossbills are present on the "east side" of Algonquin Park (heavy crop on white pine) and probably elsewhere with extensive white pine forest. Algonquin's east side pine forest is accessible from Highway 17 west of Pembroke. South of Algonquin white pine crops are poor to none. An infrequent presumed Type 2 Red Crossbill is associated with red pine forests.

White-winged Crossbill: This crossbill moves back and forth across northern coniferous forests searching for new cone crops. Most White-winged Crossbills left Ontario this past summer. They will be scarce or absent in Ontario this winter. They presumably went either west to bumper spruce and fir cone crops in Alberta and British Columbia, and/or to Atlantic Canada, which has large cone crops on spruce and balsam fir, particularly in Newfoundland and Cape Breton Island in Nova Scotia. White-winged Crossbills are currently common in Newfoundland and western Canada.

Common and Hoary Redpolls: There will be a big flight of redpolls into southern Ontario and bordering United States. Seed crops on white birch, yellow birch and alder are very poor in most of Ontario. Expect redpolls at bird feeders this winter. Far northwestern Ontario has a good

white birch crop so redpolls may be common there.

Pine Siskin: Similar to the White-winged Crossbill, most Pine Siskins departed Ontario this past summer, presumably attracted to huge spruce and fir cone crops in Alberta and British Columbia and/or to big spruce and balsam fir cone crops in Newfoundland and Cape Breton Island and probably elsewhere in the Atlantic Provinces. Some of the very few siskins that remained in Ontario are now wandering south with sightings of usually only ones and twos in southern Ontario. Large southward irruptions occur when cone crop failures span much of Canada. Very few siskins will visit feeders this winter in southern Ontario.

Evening Grosbeak: This grosbeak will irrupt south of the boreal forest this fall because tree seed crops are generally very poor in northeastern Ontario and western Quebec. In recent weeks scattered birds have visited feeders in southern Ontario. Beginning in the early 1980s the Evening Grosbeak declined significantly as large outbreaks of spruce budworm subsided. The larvae and pupae are eaten by adults and fed to nestlings. Expect Evening Grosbeaks at bird feeders in southern Ontario and northern United States, but not in the large numbers seen during the 1970s.

OTHER IRRUPTIVE PASSERINES

Red-breasted Nuthatch: They have been moving south since mid-June presumably because of the poor cone crop in central Canada. Almost all Red-breasted Nuthatches will depart Ontario's boreal forest by late fall and left the province. Some will be at feeders in southern Ontario, but they will be very scarce in Algonquin Park. Algonquin Christmas Bird Counts (32 years) show a biennial (every two years) high and low pattern, with some exceptions.

Bohemian Waxwing: The poor crop of native mountain-ash (rowan berries) in much of northern Ontario will cause Bohemians Waxwings to wander south and east this winter. Watch for them eating buckthorn berries and crabapples in southern Ontario. The mountain-ash crop is better west of Lake Superior with a big crop around Kenora at Lake of the Woods.

Blue Jay: A strong flight is expected this fall. The beechnut crop is zero and the acorn crop on red oak is only fair to good (aborted in some areas) in central Ontario. Soon thousands of jays will be migrating southwest along the shorelines of Lakes Ontario and Erie, exiting Ontario south of Windsor. This winter there will be far fewer Blue Jays in Algonquin Park and at feeders in central Ontario.

Gray Jay and Boreal Chickadee: They are moving in northeastern Quebec east of Tadoussac along the north shore of the St. Lawrence River. These movements could extend to southern Ontario and northeastern states.

NORTHERN OWLS

Small mammal populations were abundant this summer in northern Ontario, presumably increasing after the big seed/berry/fruit crops in 2006. However, crops this year are very poor in much of the north, partly caused by cold weather and snow in late spring that froze the buds and flowers of many plants. In early August, Ontario Ministry of Natural Resources biologists on aerial surveys noted many raptors near James Bay including 15-20 Great Gray Owls, Short-eared Owls (common), Northern Harriers (common) and scattered Rough-legged Hawks. If small mammal populations crash this fall, then Great Gray Owls, Northern Hawk Owls and Boreal Owls will move, possibly southward into areas accessible by birders. Northern Saw-whet Owl numbers are linked to red-backed voles (a forest vole) in Ontario. There is the possibility that this vole could decline soon because it often cycles with deer mice. The huge population of deer mice in central Ontario is declining rapidly now because of poor seed crops this summer, particularly sugar maple samaras, which they store for the winter. If red-backed vole numbers decline as they often do in association with deer mice, there will be a strong flight of Northern Saw-whet Owls this fall.

Previous finch forecasts are archived at Larry Neily's website:
http://ca.geocities.com/larry.neily@rogers.com/pittaway-old.htm

ED BOUSFIELD

Ed Bousfield was born in Penticton, B.C. in 1926. He attended Riverdale C. I., the University of Toronto (B. A., 1948; M. A., 1949), and Harvard University (PhD., 1954). He married Barbara Joyce Schwartz in 1953 (deceased 1983) and has four children and twelve grandchildren. He is now married to Joyce Burton of Ottawa.

He became an authority on amphipod crustaceans, serving at the National Museum of Natural Sciences, Ottawa as Invertebrate Zoologist (1950-1963), as Chief Zoologist (1964-1974), as Senior Scientist (until retirement in 1984), and after retirement as Research Associate and Curator Emeritus.

Dr. Bousfield described several hundred new crustacean taxa, developed a modern classification of amphipods and contributed to our knowledge of the aquatic fauna of Canada. During his career, he has travelled widely on collecting expeditions all over Canada, in Alaska, on southern U.S. and Caribbean coasts, in Australia, and in southern South America. His work contributed to an illustrated guide to "North Pacific Amphipods" sponsored for web presentation by the Royal Ontario Museum. More recent interests include the Burgess Shale arthropods and the biology of marine and freshwater megaserpents, including formal description of Cadborosaurus willsi, Bousfield& LeBlond, 1995 (a subject on which he has spoken to the Brodie Club).

Dr. Bousfield has been President (1979-80) of the Canadian Society of Zoologists and is currently an Honorary Member. He is a member of several scientific societies and is an Honorary Member of the Ottawa Field-Naturalists' Club. He has been associated with several universities, museums and laboratories in Canada and the United States. In 1978 Dr. Bousfield was elected Fellow of the Royal Society of Canada, and in 1985, he received the Government of Canada's Outstanding Achievement Award. Besides biology and natural history, his interests include curling, lawn bowling, musical instruments, and steam locomotives. He has been active in musical groups in Ottawa and in Victoria B.C. He and Joyce now reside at the Amica Swan Lake residence in Markham, Ont.

HOW BEAVERS SAVED CANADA
See A Beaver On Our Five Cent Nickel

By Yorke Edwards
Our Western Correspondent

Through many years in the 1600s, beaver hats in Europe were in full fashion but beavers were becoming scarce. Those hats were still wanted, so England's government gave money to start a Hudson's Bay Company for collecting beaver skins from North America. British ships went up and around the top of French Canada and down through Hudson Bay to build trading posts by the shore on the south west side of the Bay. French and English boats had fights about the invasion, but the English won. So they made buildings at the mouth of the long Nelson River, near the southwest side of the bay. There, for many years, they went far and wide, collecting beaver furs while paddling over the many rivers in their birch-bark canoes. The First People collected the skins, then sold them to the Europeans that were paddling to the mountains, to the treeless Arctic and finally to the Pacific Ocean. After several centuries, the beaver hats of Europeans became unfashionable. By that time, beavers were close to extinction in North America.

My last summer in Algonquin Park was spent at Lake Sasajewan, near Lake of Two Rivers, well before the Wildlife Research building was built there. We were then in tents. Beavers were my main interest, and almost daily I canoed to watch the beavers near the north end of the lake. The forest beside the lake had a few trees that had been cut down by beavers to make their dams and homes. A few other trees were cut only for the bark, while a few were cut well into their wood. Trees seen chewed were white and yellow birch, white pine, balsam fir, sugar maple, aspen and alder. I collected small sticks from those trees and put them by the shore at night to see if any were eaten. Only alder and aspen were eaten. It seemed that trees deeply cut were only for making house and dam. Later, I watched them at night eating only water plants. I saw that they were not eating trees for food, except for the bark of alders and aspens.

Bat Lake is a large pond well into the forest not far from Lake Sasajewan, to the south. In that pond is a hump of wood and mud, a beaver house. Some trees near the pond had been chewed, a few were well cut, but all were still alive. The biggest cut was in a white pine that appeared to be much alive. The other trees that had been cut included white and yellow birches, sugar maple, black spruce, white cedar and aspen. From the pond, a few paths led into the forest. Their dam of sticks and mud was made to deepen the water to protect their home. The house and dam were made of wood and mud, with the entrance door well under the water, a safe way to keep the house "closed" to any other animal. Y

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