

PAMPHLETS, PAPERS ETC. AVAILABLE

1. Moose hunting in Sweden - Description and Evaluation
2. Moose management in the U.S.S.R.
3. Energy metabolism of moose in early life - abstract from poster session
4. Diseases in Swedish moose - abstract from poster session
5. The elk (moose) shooting examination
6. The forests (Sweden)
7. Stora Kopparberg (pamphlet about this large forestry company)
8. Forestry and Forest Industry in Sweden
9. North American Native Hunting and Management of Moose Population
10. Field guide re a very informative walk we took one day
11. Position determination system - about radio telemetry
12. An automatic radio - Telemetry system for position determination and data acquisition
13. Pamphlets on various apparatus used to haul moose out of bush - if you don't like packing them out there is some ideas
14. Pamphlet light weight tree towers
15. Swedish Sportsmen's Association and how it works
16. Grimso Wildlife Research Station - describes activities at station
17. Oster - Malma - Institute of Wildlife Management - Swedish Sportmen's Association - description of it
18. Comparative antler morphology and size of North American moose
19. Moose management in North America
20. The impact of sport hunting on North American moose
21. Moose harvest strategies in North America
22. Implications of predator - prey relationships to moose management
23. Estimating moose population parameters.

June 27, 1985

2ND INTERNATIONAL MOOSE CONFERENCE

FIELD TRIP NOTES - VINCE CRICHTON

First stop on this trip was at a shooting range a short distance from Upsalla

- cannot lend firearm to anyone under 18
- everyone must pass test for shooting
- firearms permitted are semi-automatic or pump rifle for moose
 - cannot have more than 2 cartridges in rifle
 - black powder not permitted
 - minimum 139 grain bullet
- 3 classes of rifles - Class I - all game
 - Class II - all except moose, deer
 - Class III - same as II except not roe deer, beaver or lynx.
- fee for shooting moose must be paid within a fortnight after closure of season.
- fee is less for calf than adult - at most 400 SEK
- there is a damage fund in each county to pay for crop damage - not for forest damage.
- some of money generated is used to build shooting range
- the elk (moose) shooting badge are the bronze ones (photo of them)
- after January 1985, there will be new hunting regulations for anyone wanting firearms.
- there are 5 different parts to the shooting examination.
- the intent of the entire system is to improve shooting and hunting culture amongst moose hunters.
- there is an excellent shooting book called big game hunting and shooting
 - will try and get copy of this.
- the practical shooting test will not be changed - 2 types, standing and moving.
- in both types, the target moose is 80 metres away and with moving target, speed is 5 m/sec.

- moose must be hit in lung area with 4 shots standing or 3 running.
- there are different types of badges for different scores.
- noise from shooting range can be a real problem - it must be controlled as much as possible - people in surrounding area complain.
- on average, price to set up range they have in 200,000 SEK however, the one I visited is a little more expensive.
- the distance over which you can shoot at the moving target is 23 metres.
- at speed, the target moose is moving, to hit it in centre of lungs must right under the ear in neck.
- relative to dogs, 3 types are used, one looking like an overgrown beagle is a Finnish dog while the other 2 are the Norwegian elk hound and Swedish elk hound, the latter being bigger.
- dogs are trained and given an examination
- hunting with dogs
 - 1 man, 1 dog - not in pairs
 - biggest sport is going after hare (mountain hare - 2-3 kilos)
 - more than 8,000 members in a club - about 10,000 dogs (pups) every year
 - with hare hunting usually 2 or 3 hunters although it is fun to hunt them alone (2 types of hare - mountain and field)
 - hare will jump from their track 3-5 m - back and forth
 - a good dog will keep coming back to owners track
 - some dogs can get with 30 cm of hare which can run very fast
 - dog barks when he is on a track - if loses it, shuts up
 - hunter must listen to where dog is barking and attempt to get in right spot.
 - a hare or fox dog is not used for moose or deer
 - for a 1st prize, dog needs to keep on hare for 2 hours
 - for 2nd prize, dog needs to keep on hare for 75 minutes
 - for 3rd prize, dog needs to keep on hare for 45 minutes
 - dogs are judged on barking, behaviour, etc.
 - for roe deer used short legged dogs
 - with roe deer, place hunters around area where deer are, and then go in with a dog. Roe deer generally do not 'jump around' like hare.
 - once dog finds deer, starts barking
 - it is not good to have a fast dog - better to have one that goes slow - short legged, quiet dog that barks good.

- most roe deer are shot by hunters stationed around the hunting area. Hunters must be careful what they shoot as dogs cannot differentiate between male and female.
- with moose hunting, the easiest is having hunters stationed around an area and have 1 individual go in with 'moose dog' on a 5m leash.
- go back and forth with dog until a track observed or until dog smells a moose.
- if lucky, moose will head out to where hunters standing.
- dog should not bark in this situation.
- another type of moose hunting with dog is leading dogs which is most sporting if you are alone.
- if dog smells moose, he should show owner and head to animal.
- dog and hunter must be calm, quiet and dog not bark.
- when dog within 200-300 metres, dog should point. This type of hunting is difficult and done with leash attached to belt.
- moose dogs only hunt moose - not hare or deer.
- the most common type of hunting is to leg dog loose in an area and he has to find moose.
- area must be fairly large so moose doesn't know hunter is around.
- hunters placed 1-2 km apart.
- most dogs when working are smelling.
- dogs must learn not to rush - it must remain 'calm' otherwise moose takes off.
- dog will lay down and then get up after short while and go up to moose. Bull moose will stand, young moose will take off, with cows and calves, cow will come after dog.
- a good dog will go around moose barking all the while. Moose will 'go for' dog however good dog is nimble and jumps away. Dog must put up a fight and occasionally some are killed. The best dogs are insured in case of loss or accidents.
- if everything goes well and the dog is barking and moose doesn't smell hunter, he can get close enough to shoot. If moose smells hunter - good bye moose!
- other hunters must not go inside 'ring' but stay on periphery.
- some moose will take off and walk, not run.

- it is exciting to hunt this way especially if you hear barking dog coming your way.
- dogs will not bark if they do not see moose.
- with wounded animals, it is left alone for at least 1 hour to let it stiffen up.
- in case of wounded animals, hunters are placed around area where moose went in and 1 hunter enters with dog on leash.
- dogs are trained to track wounded animals by placing out blood tracks.
- a good moose dog is worth about 30,000 SEK
- if hunting moose or roe deer must have dog.
- it is a legal requirement that hunters search for wounded animals.

ACCIDENTS

- Visited an insurance company where we were given talk on moose/vehicle problems.
- by law must report if you hit moose with a car. General consensus is that of 10,000 moose/vehicle accidents 1 year, 50% are reported.
- many moose are killed in daylight hours however the risk is 10 times as great in afternoon or early evening - the highest risk time is afternoon.
- moose fences bring down accidents by about 80%
- in areas where roads recently put in, the number of accidents is 2-3 times higher.
- the cost of fences is 75 SEK/metre (roughly \$9.38 Cdn.) - \$150,000 SEK per km. This is about 1,000 km of fence in Sweden.
- Swedish cars, being of the small nature, are a perfect fit between front and back legs of moose.
- 10 - 20 persons killed/year due to moose/vehicle accidents.
- accidents due to moose/year run in terms of costs to about 200,000,000 SEK.
- lowest number of accidents occur in winter and highest number when cows chase yearlings away in spring. There also is an increase in rutting period.
- the small mirrors implanted into road didn't prove effective in terms of keeping moose away.
- there are about 10,000 roe deer/car accidents annually - their deer weigh less than 30 kg thus cost not nearly as great.

- fence put in along roadways is 2.1 metres high.
- there are different types of fences - some have a close mesh at bottom to keep roe deer off road.
- what are the effects of fences on moose populations - in some cases, there are 40-50 km of fence and some argue that this will divide moose populations into small groups and affect genetic composition.

- at 11:10 a.m. we crossed in area referred to as northern Sweden - the density of moose near Upsalla's about 1 moose/km², as we moved north it was 1.5-2.0 km² and near this northern border about 15-20/1,000 hectares
- there are only 2 species of conifers - scots pine and norway spruce.
- clear cuts offer good feeding areas for moose in summer and winter.
- clear cuts are 10-20 hectares at most with many less than 5 hectares (there are 100 hectares/km²)
- land ownership - 50% of forested land owned by private individuals.
 - 25% owned by forest companies.
 - 25% owned by state.
 - there are differences in different geographic regions (for example in south, 80-85% is private whereas in north 90% is state owned).
 - forest companies operate mainly in middle portion of Sweden.
 - private land is mostly 5-10 hectares with more than 100,000 units owned by private people.
- Note: In Ontario, 3 clear cut areas have been closed to hunting and are defined by natural boundaries. The longest closure has been for 5 years and is still closed.

- back to Sweden - in some areas they cut brush along road to a certain height so moose and drivers (vehicle) can see each other.
- what about moose killed on road - those who have rights to area come out, retrieve moose and make use of

- on the first day of the field trip as we headed north, we moved from coniferous stands along an esker to more mixed woods (aspen, birch) then to taiga type forest.

- saw in some areas that in 1950 were hay fields are now trees 20-30 feet high.
- an individual who was representative of landowners joined the tour. He works for a large timber company called Stora Kappenberg. On their land shoot about 6,000 moose per year.
- on their area the Sunnas moose pen (615 hectares) has been constructed (visited this area).
 - it was constructed in 1975 with state money.
 - there is 11 km of fence 2.5 m high.
 - bottom of fence dug into ground so it is hare proof.
 - the area is composed of the following age classes of vegetation

10-12 years old	30%
lakes	2%
25-30 years old	30%
40+ years old	20%
marsh	18%
- 4 female moose were initially put in fall 1978 and in 1979, 8 moose/1,000 hectares; 79/80 - 13/1,000 hectares; 80/81 - 23/1,000 hectares; 81/82 - 33/1,000 hectares; 82/83 - 45/1,000 hectares; 83/84 - 51/1,000 hectares.
- presently (summer 1984) have 30 adult moose plus an unknown number of calves.
- the moose density is to be held at 50 moose/1,000 hectares.
- the preferred species for moose is mountain ash, aspen, willow, birch (silver birch, common birch) however from a quantitative point of view alder in the wet areas (low preference, rarely browsed), 3 species of conifers - *P. sylvestris* (common sp.), some lodge pole pine and Norway spruce plus juniper (low preference). As density of moose increased, started to see some browsing on spruce - not certain if it is 'random' picking or not.
- average snow depth in this area is 35 cm with 1st snows about December 1.
- one shrub commonly browsed is *Vaccinum* (blueberry) which is important in winter if little snow plus summer.
- one of the Forbes important in summer is fireweed.
- there are some grasses that are also used.
- the main study in pen is moose vegetation - studying changes in browse, browse use and density of browse as density of moose population increases.
- some heather is eaten also.

- crude protein is fairly constant in blueberry from fall to spring.
- within the enclosure there is another enclosure that has had no moose for 5 years. Outside enclosures there are many small trees (moose browsing keeps them down) while inside there are a lot of large ones 2-3 m high illustrating the effects of browsing.
- question was asked if density of deciduous trees inside will affect height of pine - to this point no difference seen in height of pine. 2 papers have been written by Roger Bergstrom on this project which appear in moose conference proceedings.
- 80-90% of total browse production is pine - rest is birch with a very small percentage being aspen, birch, willow, juniper.
- 250-300 kg of pine browse produced per hectare.
- 30-50 kg of birch produced per hectare.
- moose can't live on preferred sp. - too many.
- 40-70% of food eaten is pine with remainder made up of deciduous sp and juniper.
- in terms of browse production, there is almost nothing produced after a clear cut then there is an increase until stand age is 15-20 years then in mature forests just a few kg produced.
- looking at these areas in summer, the habitat looks significantly different than in spring before leaves.
- in some areas moose are eating more than production. In some cases 50% of consumption is from new growth and 50% from old growth.
- re browsing, found there is a higher probability of a browsed birch being browsed again than an unbrowsed.
- item breakage - when moose can't reach browse on stems - will break it - did experiment and put moose in pen where lower browse cut off - immediately got breakage.
- 3 types of browsing - none, medium and heavy - leaf colour varies from yellow green on tree not browsed to dark green on heavily browsed trees - more chlorophyll.
- in crowded situations found production of birch shoots going down.
- as twig size increases, quality is affected - goes down.
- with invitro digestability - twigs of 2 mm size there is a certain rate of digestability - if all twigs are included rate of digestability goes down.

- in estimating number of moose by using 'pellet' groups in summer, the number of moose are heavily underestimated.
- next stop in town was a processing house for moose put up by group of hunters - their quota of moose for 1984 was 75.
- this group of hunters (120 members) put up processing house 2 years ago.
- 8 hunters went out the previous evening and shot a moose to enable them to demonstrate the processing method to us.
- the plant they have holds 75 moose.
- hides sold especially to Germany - 80 SEK for 1 adult hide.
- this evening stayed at Furudals Bruks which is an old iron mill very active in 1700's - 1450 people lived here at one time.
- Sweden at one time produced 40% of world's iron - a metal plant was here at one time and this was followed by making of irons and chains (anchor) which proved very strong.
- ore and products shipped out in winter over ice.
- everything came to a standstill in 1884 when shipping costs were too great.
- bought by lumber company in 1886 and now owned by same company.
- today buildings have been modernized and used to train Swedish business people about communication.
- went on a 2-3 km walking tour which was excellent.
- this area is southern part of taiga zone.
- in middle and late 70's there were many complaints in this area re moose damage.
- started moose population ecology in this area in 1978 (70 km²).
- there is a migrating moose population.
- 4 forestry companies own part of area plus there is a number of private landowners.
- the area is comprised of precambrian rock covered with glacial till and some sedimentary soils, 200 m above sea level with highest peak about 700 m; dominant forest trees are spruce and pine.
- winter range is 87% pine and juniper and 13% deciduous species whereas the summer range is 51% pine and juniper and 40% deciduous.

- in younger forests, 95% of consumed biomass is pine with remainder being juniper and birch.
 - over the whole of winter range about 75% of production in pine and stomach analysis supports this.
 - in stands greater than 20 years, utilization exceeds 100%, that is they eat more than annual production.
 - maximum snow depth occurs in March.
 - 70 cm of snow causes trouble for moose - they have in excess of 70 cm for about 12 days in March.
 - in the summer range area have 120 days with snow greater than 70 cm snow.
 - there are roe deer and a fairly good population of grizzly bear in this area.
 - moose population in this area
 - very few moose in highlands during winter - 2-3/1,000 hectares.
 - in winter area up to 70/1,000 hectares.
 - in December 1982 there was 1400 moose in area following the hunt - harvest was 556.
 - in survey found 511 males, 600 females, 11 unknown and 249 calves.
 - average age of females is 4.6 years and 3.4 for males with oldest animal being 16 years and sample size of 200-300 jaws.
 - 19% of males were older than 6 years.
 - the average age has been lowered by hunting pressure
- | | | | | |
|------------|------|------|-------|-----------------------------|
| calves/cow | 1980 | 1982 | 1983) | } after main hunting season |
| | 0.63 | 0.57 | 0.4) | |
- ovulation rate: 1980
 - all females 2 years are breeding
 - no yearling females bred
 - 1.1 calves/cow produced
 - a low ovulation rate in 1981
 - in 1980 found 10/20 with 2 corpora lutea
 - in 1981 found 2/25 in 3+ year old females - something happened
 - in December 1982, proportion of males was 45%. Increased hunting pressure caused proportion of males to decrease from 1980 to 1982.
 - in addition to yearling females not breeding, there was a low proportion of twins.
 - there is a tremendous difference between here and Grimsa. In Frudals area, productivity is much lower. This type of productivity is representative of island populations. Productivity is greater near the

the coast plus calves and young yearlings are much smaller in Frudals area than Grimsa.

- evidence seems to suggest that bears are taking moose calves in Frudals area.
 - some moose move at least 10 km between winter and summer range while some are non-migratory.
 - cows increase home range in rut whereas bulls do not change much.
 - return to same area year after year.
 - yearlings seem to have a home range around the mother but not all that close to them.
 - moved cows away from calves in November and found that they moved right back to calves in 4-5 days.
 - with migratory populations, hunters didn't utilize populations optimally and populations exploded - areas weren't being harvested while others were being hit hard. There is a strong need to develop programs to reflect changes in moose populations in areas. There are some areas in northern Sweden where, because of migratory moose populations, moose have been extirpated.
 - in total Frudals area, have about 1200 head of moose and 5000 hectares of young pine.
 - 23% is undamaged, 18% slight damage; 19% severe damage and 40% very severe damage - by moose.
 - cost on a hectare very severely damaged is 10,000 SEK.
 - prior to the walk we were given a handout to describe what was happening at each site.
 - logging company has 500,000 h² damaged by moose yet few shot here but in another area. If they have to feed moose, want to be paid for damages as this cuts into timber available for sale.
 - on 500 hectares in this area had 5,000,000 SEK in damage costs. Costs were arrived based on making new plantings, lost years, quality damage
 - when quality knocked down there is a loss.
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- next part of trip was to visit a hunting area - number of displays, techniques for hauling out moose, etc.
 - at initial part of tour in this area, an elderly man was sitting around a smoking log. In past, very few moose in areas but these old hunters knew a lot about moose and were very effective.

- the hunter in charge of this area has shot over 300 moose.
- they have an interesting back pack with a 'staff' used to lift weight off one's shoulders.
- in part used horses quite extensively to haul moose out of bush but not as extensive now.
- have a small plastic sleigh - this used to haul hides out of bush - very easy to pull; a whole myriad of apparati used to haul moose or parts of them out of bush.
- some of the mechanical devices used are used primarily for forestry industry practices such as thinning, etc., but are useful if one has them for moose hunting.
- had coffee this p.m. in an old barn made into a bar - very unique place.

- visited a mountain farm used in part
- heard horns played which were used in part for communicating between people.
- the farm we visited is largest and best preserved of its kind in Sweden - 11 houses, 300 years old.
- 2750 metres of fence were constructed to keep cattle in.
- government keeps individuals working here from June 15 to August 10. Swedish youths come here to learn about old Swedish history as well as people from all over world (8000-9000 visitors per year).
- farmer brough cattle in every night because of bears.
- long horn now played as a signal instrument but in part was used to frighten bears and wolves.

- in Sweden, more money is obtained from saw timbers rather pulp thus the economic loss due to moose is much greater because of this.

- some notes from Quebec
 - removed black bears (25-30 in 1983) and again this year from 350 km².
 - want to reduce bear population by 50%.
 - saw response to removal last year however want to check results again this year.
 - minutes approved program and it appeared in paper.
 - used a type of leg snare that is better than aldrige leg snare.

- visited an insurance company and heard talk on moose vs cars.
 - have simulated moose/vehicle accidents using cars and tires bound together to represent moose (9 wheels on an axle).
 - simulated crashes using cars at 78 km/hour.
 - most accidents occur in middle of Sweden.
 - doctors found that more roof of car came down, the more severe the injury.
 - head and neck injuries resulted in 92% of fatalities.
 - most of cars go under moose thus very little damage to front of cars.
 - ride windows bulge out and then explode.
 - there is alot of tension put on back of car also.
 - in ordinary crash, windshield goes out but when moose involved, windshield goes in cutting people in face - blindness common.
 - the pillars at side of windshield frequently give way and bend.
 - used an example re costs of an accident involving a young man insurance, vehicle, etc. - 6,602,000 SEK - with older folks, costs not as great because life expectancy at that stage not as long.
 - Ford Motor Company is interested in work the insurance company is doing but not Volvo.
 - changes are being made in glass and pillars to reduce injury.
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- arrived at Grimsa Wildlife Research area in mid afternoon.
 - this area is famous for moose as well as iron mining.
 - this is an old estate that was active until end of 19th century.
 - this now belongs to National Swedish Environmental Protection Board which was established in 1974.
 - 14,000 hectares with Grimsa at north end.
 - flat, bobby area divided by a river - west portion is poor land dominated by pine, earth mixed habitat of pine, birch and in south more pronounced amount of birch.
 - have an area inside that is treated in normal way i.e. logging, etc.
 - winter moose population of 15-16 animals/1,000 hectares in area and with roe deer 30-40/1,000 hectares; also have fox, mountain hare, and other small game.
 - wildlife sp. that are of economic importance are a focal point.
 - hunting rights belong to station.
 - very few scientists employed by Board - about 10 scientists do their work here - something like Delta.

- at outset did some intensive work but following this period tried to intermingle studies i.e. between predator and prey.
 - 1st step in moose research is describing their movements and habitat use. Next step is more focus on forestry and moose.
 - some experimental hunting goes on and are now getting into nutritional studies.
 - alot of excellent equipment available with biotlemetry being very important.
 - have developed an automatic telemetry system and use it for moose. Works good in an enclosure but not very practical in field situations in North America. Transmitters are transponders - only transmit when activated by a signal - can activate it at about 12 km depending on how animal is standing.
 - everyone travelling in area with government vehicles must report sightings of moose - found this is a good index as to what is there.
 - 2.5 million SEK to run station.
 - moose have been in area since 1975 - sold or gave offspring away.
 - have been interested in calving process and relationship between calves and mother up until she gets rid of them in spring.
 - 2 researchers studied pen moose.
 - theory states that as long as tree is in browseable zone and available it is chemically defended and when out of browsing zone, chemical defense no longer exists.
 - branches from large trees are palatable to moose and when cut down gobbled up.
 - testing theory in pens - took juvenile trees 3 metres high and took top of adult trees 6-9 metres high - cut 100 of both sp. of birch - arranged trees in front of tower in random arrangement and let moose in.
 - on average, spent about 4 times as much time at mature vs immature branches.
 - 4 times number of bites at mature vs immature.
 - bite diameter similar.
 - consumption per unit of time about same at each
 - mature trees more palatable.
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- at Grimsa, have a very detailed exhibition set up to inform people - trying to give people a little education in basic ecology.
 - stayed at a Methodist Bible Camp which was quite a place - meals etc. supplied - at this stage of tour, waist-line starting to reflect the good food.

- note - yohombine is an excellent antagonist for rompun.
- on the morning of August 30, we participated in a moose drive - a total of about 20 moose were pushed from an area less than 1 mi².
- during moose hunt, if a hunter messes up i.e. moves, etc., and screws up hunt, he is generally told to go home.
- a communication system is set up between hunters so they know what has been shot.

- at Grimsa, they have a rather elaborate telemetry system set up.
- transmitters are in fact transponders - only transmit when activated by signal.
- the system they have in place can result in the transmitter being activated at about 12 km however, this again depends on way animal is standing in relation to tower.
- with transmitters designed to monitor heart rate, the signals are stored in the transmitter around neck and when collar activated the signals are sent.

- biologists can be certified to buy drugs for immobilization and use them without vets.
- the transponder system is the enclosure they have can result in an accuracy of $\pm 40\text{m}$ (circle of this radius).
- time is used to measure signal - determine delay time from each tower to location of animal - this information recorded on tape and is then decoded.
- this system works SK to -30°C and can monitor up to 60 animals at one time. All transmitters are on same frequency - a code is sent out to each one to get it to work. Note: This system works OK if you have animals in an enclosure and terrain is flat however, it is not practical for most areas in North America. The system is similar to one being used in France.
- they have invested \$1-2,000,000 U.S. in system.
- weather really affects system - in bad weather its "Miller time".

- the next stop on tour was the Swedish Sportsmen Foundation at Oster Malma.

- this is quite a facility with old and new buildings.
- I was fortunate enough to sleep in an old castle which has been fixed up rather nicely. The facilities are part of an estate constructed in 1650 with the exterior pretty well unchanged. Many things were of interest here particularly the Turkish tapestries from the 18th century.
- the estate contains 800 hectares of forest, 200 of water and 400 of arable land bought by state in 1944. Today the area is managed by the State Forest Service who manage all Crown land in Sweden.
- the Sportsmen Federation have leased the area since 1946 which includes the main building, hunting rights and an adjacent estate (all told about 2,000 hectares).
- an impressive display of roe deer antlers on walls of old building - every set from bucks that had been shot on estate over last 100 years.
- in 1947 the 1st training in wildlife management occurred and since then there have been many courses about 10 months in length plus some shorter ones.
- sportsmen annually pay a membership fee and this money is used to finance operations.
- the Federation is responsible for all wildlife management on estates.
- last year 13 moose were shot on estate (2,000 hectares).
- there is a variety of wildlife species on estate including every cloven hoofed animal in Sweden.
- 3 categories of teaching game management
 - game research
 - practical wildlife management
 - wildlife conservation techniques
- there is a great deal of research work carried out here and at another field ecological station.
- various game management and conservation techniques are tested here on landscape.
- there are about 15 small ponds that have been created for waterfowl.

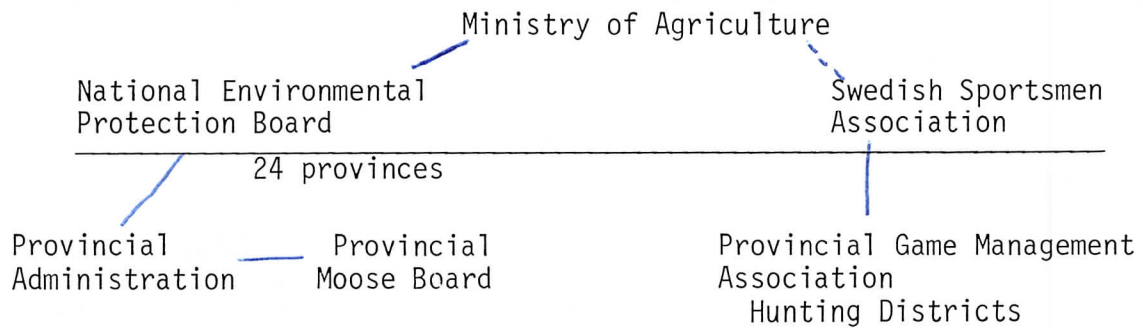
- there are, in Sweden, 15 counties with each having its own game manager.
- there are a total of 70 people employed by Swedish Sportsmen's Federation.
- each county has a board which works with game manager to set seasons, bag, etc.
- the board is comprised of local citizens and they attend the school to attend courses.

Administration of moose hunting and rules in Sweden

- rules are laid down in game act
- basic rules
 - right to hunt belongs to landowner.
 - no one can hunt on his land without permission - landowner controls hunt.
 - all species are protected by law except during hunting season for that species.
 - animals wounded must be trailed and killed immediately.
 - forbidden to shoot animals from motorized vehicles.
 - cannot hunt on other people's land.
 - if violation occurs person is punished severely.
 - the time of day when hunting can occur is controlled as well as type of rifle.
 - leg hold traps strictly forbidden.
 - moose hunting is governed by 'vigorous' regulations and they are hoping to have new rules in 1985.
 - re moose hunting, there must be enough moose in an area before hunting allowed.
 - area to be hunted is reported to provincial government and is registered as a moose hunt area.
 - no hunting is allowed if it is not a moose hunt area.
 - licences are allocated on basis of land available to support a population.
 - on small areas there is 5 days of hunting while on larger licenced areas hunting season lasts up to 80 days.
 - if landowners pool their land to get 400 acres, probably would get 1 licence to harvest 1 moose.
 - if landowners divide their land to 5 units, then will have at least 10 moose - doesn't make sense to many - in this way they can have many hunting areas.
 - 15,000 licenced areas and 20,000 smaller areas.
 - small areas represent 4% of total hunting areas.
 - a new system is being implemented and the proposed allocation to small areas is calves only - feel it will result in more co-operation.
 - in addition to permits, can shoot moose causing severe damage to forests or crops.
 - hunting starts in north of county and the starting date is decided by

government while the provinces decide length of season.

- hunt starts about September 1 in north with a break during the rut and early October. A new season in late October, November and December.
- in central Sweden, hunt starts after the rut and length varies occasionally running to January.

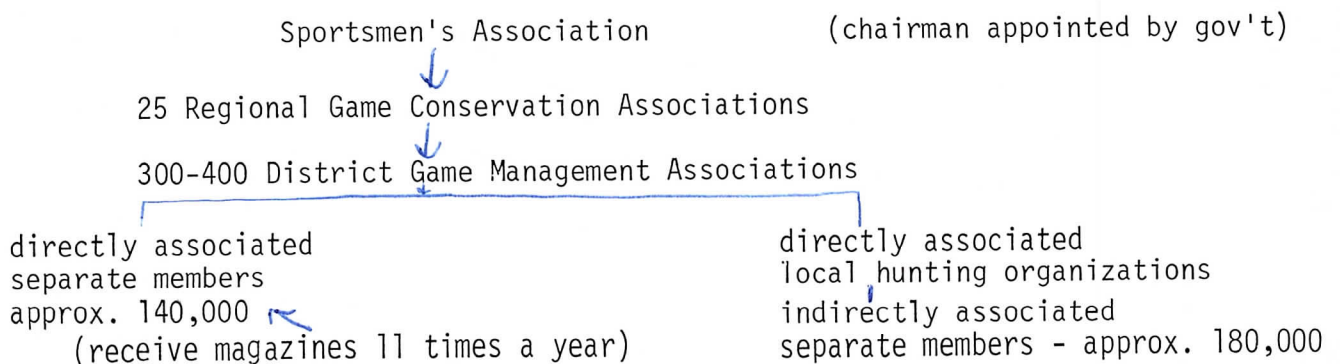


- both board and association work close together.
- Provincial moose board is advisory and has as members, outdoor recreationists, nature types, conservationists, agriculturalists, hunting associations, forestry interests, roads people and safety experts.
- each province has provincial game management association and each province is divided into number of districts and hunting areas in districts.
- all hunting data for each district is compiled at end of season.
- provincial game management association submits proposals for quotas for each hunting district. This is then sent to provincial moose board. After this provincial administration makes final decision on number of licences sold/hunting district.
- changes can occur in proposals especially in recent years with high populations.
- provincial administration knows little about hunting which is considered good by most - they do what they are told.
- people on provincial moose board are appointed - on a split vote, chairman makes decision.
- hunting districts prepare proposals for allocation of licences to various hunting areas. They feel locals know more about moose than provincial administration. This in turn sent up to provincial management association then to moose board and to provincial administration who approve it and advise hunting areas.

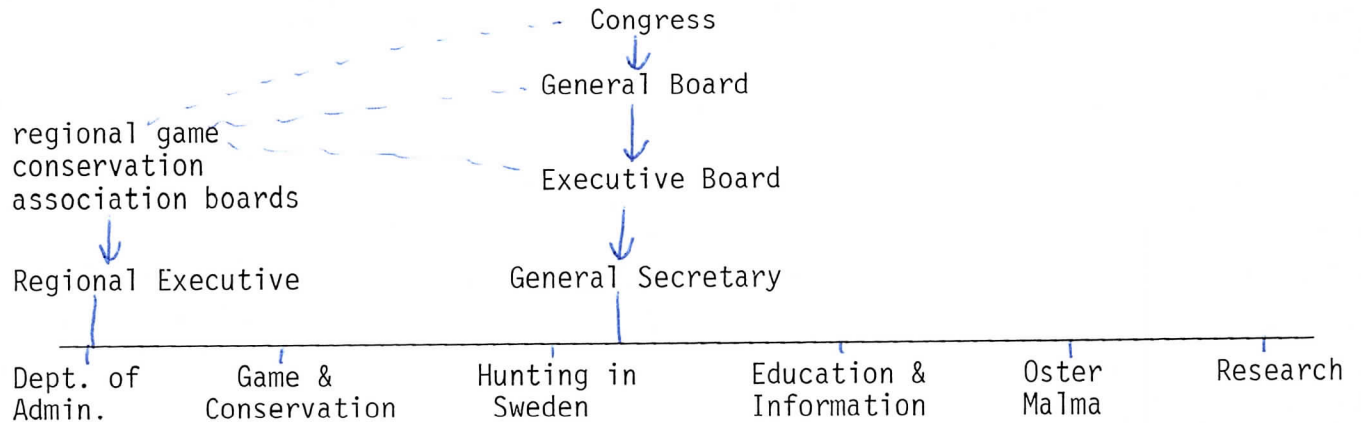
- usually in hunting areas get 50% adults and 50% calves.
- occasionally adults divided into male and female but generally not.
- dogs must always be available.
- when come across cow with calf or twins, the cow cannot be shot until calves are killed.
- in recent years, 40% females shot and 60% males.
- doesn't have many trophies.
- hunters who are not satisfied can appeal to national environmental protection board.
- have 400-500 appeals annually in August and September after which hunters are wished 'good luck'.
- about 80% of number of moose allocated are shot.
- fee must be paid for each moose shot - \$15-\$40.
- fees go to a special fund which are used to pay farmers for crop damage. Can also be used to build shooting range.
- all rules concerning hunting are looked after by neighbours - they keep each other in line. Violations are not socially accepted.
- if landowner doesn't shoot enough moose, by law, government can go on his land and shoot animals.
- if there is not enough money in county fund to pay damage claims there is the option of going to a central fund.
- cannot get compensation for damage done to forests
- people hunting deer don't all have to pay when an animal is killed - because of damage this will change.

Swedish Sportsman's Association

- is a group of hunters, ruled by hunters and working for hunters and wildlife.
- founded in 1830.
- they are the leader in game management
- 300,000 hunters in Sweden



- about 200,000 of Swedish hunters are organized.
- central office is in Stockholm with branches around country.
- the association is set up as follows



- there is a close working relationship with authorities.
- seasons are set 3 years in advance but, they can be changed if there is good reason.
- they annually obtain 15,000,000 SEK (Krona) from membership fees.
- do not have to belong to association to get a licence.
- each member pays special fee to regional game conservation association, district game management association and game conservation.
- there is at least several billion SEK involved annually.
- about 8-10,000,000 SEK are annually paid for damages done by wildlife.
- the advantage of having hunters organized versus unorganized is it enables government, etc. to communicate with hunters.
- Finland has compulsory registration in their sportsman's association.
- annually 25,000,000 kilos of moose meat available.
- a special fund was set up to have a game research fund - each member contributes 10 SEK/year.
- sportsmen in Sweden pay for everything done re wildlife in connection with hunting.
- no tax write-off for contributions.
- system seems to be working

- hunter education
 - small groups formed (5-70 people) in local areas.
 - choose a leader in each group.
 - each group has a textbook on subject they wish to study.
 - meet 10-15-20 times/winter - have a study guide and test each other.
 - discuss their own experiences and what they want to do.
 - the moose book is read by 70,000 hunters.
 - hunters quickly learned about how to build moose population up - now must learn how to bring it down.
 - starting January 1, 1985 there will be a compulsory written exam - each new hunter is to be examined. 80 questions and 66 must be right. It is a theoretical and practical exam.
 - 20,000 hunters each year go through moose book.
 - found that best way to unite hunters into a group is to learn about game management.
 - could not have come this far without involvement in education. The important thing that came through was involvement of hunters.
 - policemen enforce regulations.
 - there is another sportsman organization comprised of about 15,000 hunters - they are the opposition to Swedish Sportsman Association.
 - the Swedish Sportsman Association feels moose harvest should be based on productivity. The other organization feels each estate should be able to shoot 1 adult moose. This system was in place until 1945 - until then only about 10,000 moose shot/year.
 - has taken over 100 years to this stage.

- went on a walking tour through the area
 - breed and sell red deer.
 - in 1975 released them to surrounding area and now have a wild population.
 - in Sweden about 400-500 shot annually.
 - populations are up in southern Sweden.
 - cause forest damage on spruce and are very wily-moreso than moose.

- in part, every piece of land that could be set aside for forestry was - now law has changed. Now allowed to set aside areas of 1 or 2 hectares for wildlife.

- the Federation puts up elaborate signs, etc. where they carry out such things as winter feeding for roe deer, nests, salt licks, etc.
- following the war, people returning from war were given land - today these areas no longer in use - used for wildlife - homestead areas.
- use pellets to feed roe deer.
- Sweden has one of most dense populations of ospreys in world.
- wetland areas have been significantly reduced resulting in decreasing waterfowl populations.
- now in process of creating new wetland areas.

Those interested in putting on next International Moose Conference will be up against the wall in terms of attempting to match the field trip put on by Swedes.