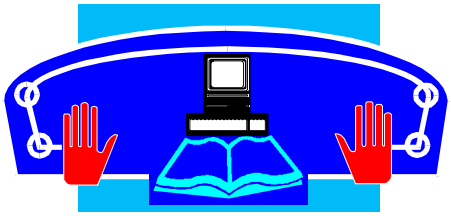

Options To Diversify A Fox Ranch At Hay River, Nwt; A Feasibility Study Conducted For Magrum Farms

Type of Study: Primary Production Wildlife Products, Fur Ranching

Author: Hubert And Associates Ltd

Catalogue Number: 5-7-5

OPTIONS TO DIVERSIFY A FOX RANCH AT HAY RIVER, NWT; A FEASIBILITY STUDY CONDUCTED FOR MAGRUM FARMS

Sector: Wildlife Products

5-7-6

PRIMARY PRODUCTION

Options to Diversify a Fox Ranch at Hay River, NWT

A Feasibility Study conducted for
Magrum Fur Farm

Options to Diversify a Fox Ranch at Hay River, NWT

A Feasibility Study
conducted for
Magrum Fur Farm

by

Hubert and Associates Ltd.
Yellowknife, NWT
1990

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A. INTRODUCTION

This study examines the costs of producing pelts of several species in a ranch setting. The object is to determine the merit of diversifying the species reared for pelt production on an existing commercial silver fox ranch near Hay River. This work draws on the work and strategy of a 1984 study which examined the feasibility of a silver fox ranch (Boreal Ecology Services Ltd. 1984). That study proved the feasibility of a fox ranch under market conditions at the time. Market conditions have since changed significantly for the industry as a whole.

This report assesses the costs of producing other northern species under ranch conditions. Costs are based on mink and fox pelt production. Pelt prices are based on recent averages for northern species. It is assumed that the loss in price for younger and therefore smaller pelts will be made up by their higher quality due to ranch conditions, nutrition and handling. The authors feel that market prices for ranched marten, fisher or lynx will be dominated by wild fur prices because of their greater abundance. There should however, be a premium on ranch produced pelts as soon as their volume is sufficient to justify their own grade lots at auction. In the meantime the average prices brought for wild fur is justified for comparative purposes but should be regarded as the "worst case" scenario.

B. ANNUAL CYCLE

We have divided the year into 26 - two week periods. Week one starts April 1 which is expected to be the peak of the whelping period for fox, marten and fisher, but not lynx. Experience to date has shown that fox whelping can be spread out over a seven week period with the peak occurring as much as a month later. These same two week cycles are also used when discussing the feeding cycle (Tables 5 - 8). The following section shows highlights of the fox cycle and also

summarizes basic environmental conditions for Hay River. The daily maximum and minimum temperatures are based on 1974 -1984 weather records whereas the extremes are based on all existing records up to 1984.

1. Weather Conditions

Daily Max. and Min. Based on Two Week Average over 10 Year Period(C°) 1974-1984
Length of Sunlight per Day (Hrs. + Min.)
Extremes from All Existing Records to 1984

Date	10 Year Average & Sunlight	Events*	Extremes
Week 1-2			April
April 4	max. 1.00 min. -10.04	- fisher, marten kits born - fox pups born	30 year average max. 1.5 min. -9.9
" 4	13h 41m sunlight	- surface water	extremes
" 11	14h 15m "	system start-up some lynx breeding may still be occurring - breed fisher (6-8 days after whelping	max. 23.8 min. -38.9
Week 3-4			
April 18	max. 7.34 min. -3.56	- fisher, marten kits born - fox pups born - start dry feed for Pups	
" 17	14h 49m sunlight		
" 26	15h 40m "	- breed fisher (6-8 days after whelping	
Week 5-6			May
May 2	max. above zero min. -1.63	start weaning fox, marten, fisher - breed fisher (6-8	30 year average max. 10.2 min. .4
" 2	16h 14m sunlight	days after whelping.	extremes
" 8	16h 57m "		max, 33.3 min. -18.9
Week 7-8			
May 16	max. above zero min. 2.37	wean fox, marten, fisher - dry feed for fox marten fisher	

*These events will vary from year to year. The dates given are approximate. Breeding occurs over a period of 3-6 weeks as will whelping. -

May 17	17h 32m sunlight	- lynx kits born
" 23	18h 01m "	
Week 9-10		
May 30	max. above zero min. above zero	- start separating marten kits to individual cages
" 29	18h 26m sunlight	
June 7	18h 58m "	
Week 11-12		
June 14	max. above zero min. above zero	- start separating fox pups to individual cages
" 13	19h 11m sunlight	- prepare to breed marten
" 22	19h 28m "	
Week 13-14		
June 28	max. above zero min. above zero	- breed marten
" 28	19h 14m sunlight	
July 4	19h 02m "	
Week 15-16		- breed marten
July 12	max. above zero min. above zero	- start weaning lynx kits
" 13	18h 34m sunlight	
" 19	18h 09m "	
Week 17-18		
July 26	max. above zero min. above zero	
" 25	17h 41m sunlight	
August 3	16h 54m "	
Week 19-20		
August 9	max. above zero min. above zero	
" 9	16h 25m sunlight	
" 15	15h 52m "	
Week 21-22		
August 23	max. above zero min. above zero	- lynx kits weaned
" 24	15h 02m sunlight	
" 30	14h 28m "	

June
30 year average
max. 17.2
min. 6.5
extremes
max. 33.3
min. -5.6

July
30 year average
max. 20.7
min. 10.8
extremes
max. 35.0
min. 1.6

August
30 year average
max. 19.4
min. 9.3
extremes
max. 35.6
min. -1.1

4

Week 23-24			September
September 6	max. above zero		30 year average
	min. above zero		max. 12.4
			min. 3.7
" 5	13h 54m sunlight		extremes
" 14	13h 04m "		max. 30.0
			min. -11.7
Week 25-26			
September 20	max. above zero		
	min. not. talc.		
" 20	12h 30m sunlight		
" 26	11h 57m "		
Week 27-28			October
October 4	max. 6.01	- prepare to shut	30 year average
	min. -1.19	down water system	max. 4.8
			min. -2,9
" 5	11h 06m sunlight		extremes
" 11	10h 33m "		max. 24.4
			min. -20.0
Week 29-30			
October 18	max. 2.51	- prepare for wet	
	min. -4.88	feeding program	
" 17	10h 00m sunlight		
" 26	9h 09m "		
Week 31-32			November
November 1	max. -2.46	- select next year's	30 year average
	min. -10.21	breeding stock	max. -7.3
		(fox, lynx)	min. -15.3
" 1	8h 36m sunlight		extremes
" 7	8h 04m "		max. 15.0
			min. -39.4
Week 33-34			
November 15	max. -8.91	- prepare for	
	min. -16.88	pelting	
" 16	7h 17m sunlight		
" 22	6h 49m "		
Week 35-36			
November 29	max. -17.48	- pelting	
	min. -25.31		
" 28	6h 25m sunlight		
December 7	5h 52m "		December
			30 year average

Week 37-38
December 13 max. -16.31 - pelting
min. -24.98

" 13 5h 39m sunlight
" 19 5h 32m "

Week 39-40
December 27 max. -18.88 - start pre-breeding
min. -27.02 diet supplements
(fox, lynx)

" 28 5h 36m sunlight
January 2 5h 43m "

Week 41-42
January 10 max. -17.26
min. -26.92

" 11 6h 10m sunlight
" 17 6h 35m "

Week 43-44
January 24 max. -17.19 start running males
min. -27.79 with females
(fox, lynx)

" 23 7h 02m sunlight
February 1 7h 46m "

Week 45-46
February 7 max. -15.58 signs of heat
min. -25.56 early breeding
expected (fox, lynx)

" 7 8h 11m sunlight
" 13 8h 53m "

Week 47-48
February 21 max. -12.76 fox breeding
min. -24.16 should be at
peak

" 22 9h 42m sunlight lynx breeding
" 28 10h 17m "

Week 49-50
March 7 max. -10.92 some fox breeding
min. -23.03 still taking place
lynx breeding

" 6 10h 52m sunlight
" 15 11h 42m "

Week 51-52
March 21 max. -6.48 expect some fox
min. -18.15 pups to arrive
lynx breeding

" 21 12h 16m sunlight
" 27 12h 49m "

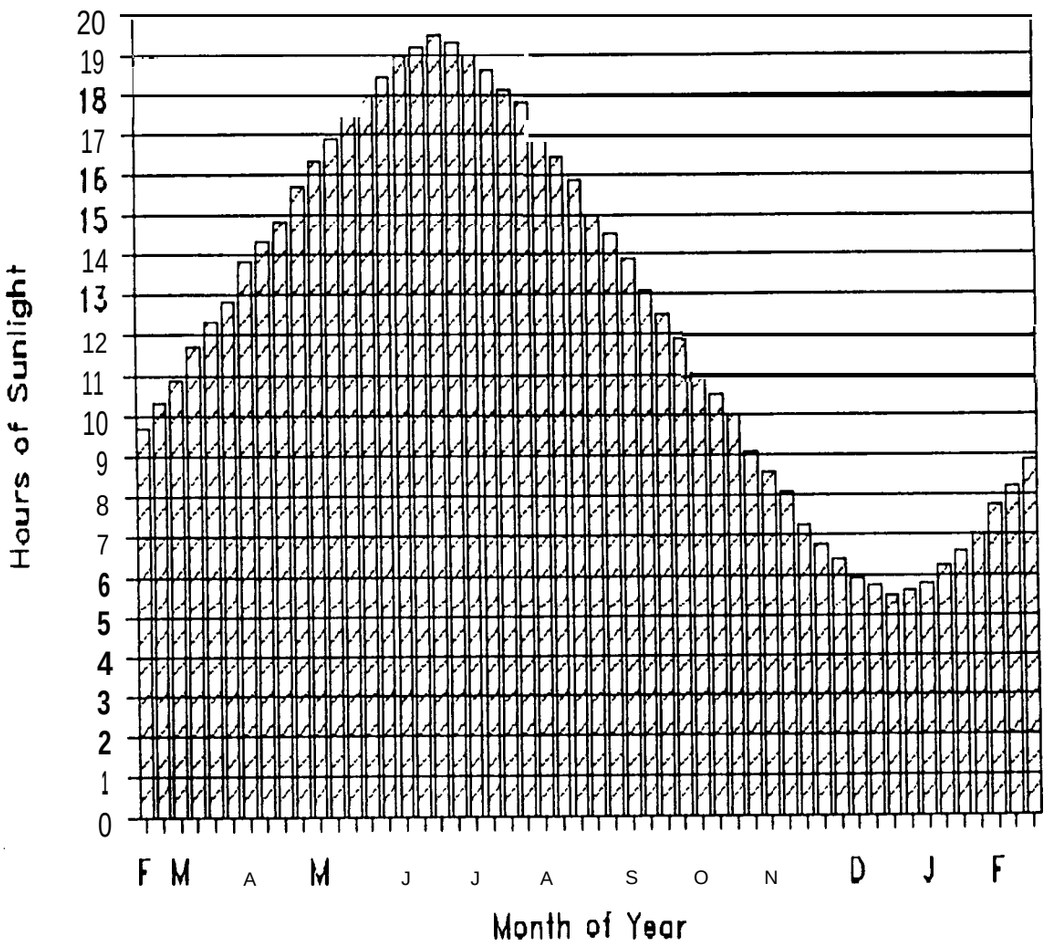
max. -16.5
min. -25,3
extremes
max. 12.2
min. -47.2

January
30 year average
max. -21.0
min. -30.5
extremes
max. 7.2
min. -47.8

February
30 year average
max. -16.2
min. -27.2
extremes
max. 13.9
min. -48.3

March
30 year average
max. -10.2
min. -22.4
extremes
max. 15.6
min. -44.4

Figure 1. Hours of Sunlight per Day in Hay River, NWT.



C. GROWTH RATES FOR MARTEN, FISHER, AND LYNX

Available data on reproductive cycles and growth rates for mink, marten, fisher, and lynx are shown in Table 1. and Table la.

Table 3.1 and Figure 2 show the growth rate for fox; Table 3.2 and Figure 3 show the growth rate for mink (Nat. Res. Coun. 1982.) For marten, fisher and lynx, average body weights were calculated and growth curves were estimated (Tables 3.3, 3.4, 3.5, Figures 4, 5, 6). Limited data on body weights at various stages of growth were available for marten, fisher, and lynx. The difference between age specific weight values divided by intervening time in weeks was used to plot average values between ages for weights given in the literature. In cases where few data points were available a straight line increment resulted rather than the probable curve.

Example:

Marten birth weight 28 g. (Table 1).

Size at 4 weeks for males 200 g. (Table 1).
(200-28)/4 = 43 g is the estimated average weight gain per week for weeks 1 through 4 (Table 3.3 Figure 4).

Size at 12 weeks for males is 1010 g. (Table 1).
(1010 g - 200 g) / (12 - 4 weeks) = 101.25 g estimated average weight gain per week for weeks 5 through 12 (Table 3.3 Figure 4).

Table 1. Summary of Life History Data for Marten, Fishe

SPECIES	BODY WEIGHT (kg) MALE	FEMALE	BREEDING	GESTATION	WE
MARTEN	.758 -1,148 a	0681- .851 a	late July - early Aug. a	8.5 - 9 non. delayed implantation, active gestation 27 days c	M
	1,:62-1.816 d				
	.563 - .990 b	.4 - .605 d			
	.670 c	.409 c			
Av.Ad.Wt	1.010	0.559			
FISHER	2.724 - 5.448 a	1.362 - 3.178 a	earn to mid April, 6- 8 days after giving birth c	10.0 -11.9 mon. delayed implantation, active gestation 30 - 60 days c	la ea ea to
	3.632 -5.448 d	2.210-2.724 b			
	3.8 c	1.83 c			
	3.5 -5.5 b	2.0 -2.5 d			
Av.Ad.Wt	4.2315	2.212			Ma
LYNX	6.8 -13.6 a		Jan Feb a	62 days a	Ma A
	8.2 -12.7 d		March d	63 days c	
	9.1- 10.6c	8 - 8.8 c	Mid March - early April c	62 days d	la ea Ju
(bobcat:	7.5 -25.8 b	3.8-15 b)			
Av.Ad.Wt	10.1667	8.4000			

a. Burt, W.H., R.P. Grossenheider. 1952. Field Guide to the Mammals. Riversi
b. Chapman, J. A., G.A. Feldhamer. 1982. Wild Mammals of North America. John Ho
c. Novak, M.J.A. Baker, M.E. Obbard, B. Malloch. 1987. Wild Furbearer Managemen
d. Soper, J.D. 1964. The Mammals of Alberta. Hamly Press. Edmonton.

Table 1a. Summary of Life History Data for Mink.

SPECIES	BODY WEIGHT (kg) MALE	FEMALE	BREEDING	GESTATION	WHELP
MINK	,681-1.362 a	.5675 - 1.09 a	Jan. - Mar. a	42 days a	Apr.
	0.9 -1.6 b	0.7 -1.1 b	Late Feb, - early Apr. b	51 days b	Lt. Ap mid Ma
	0.7 - 2 c		affected by photoperiod c	Av. 51 days c	Apr. -
	.7924 - 1.132 d	0.7491 d	Mar. - Apr. d	49 - 56 days d	
Av. Ad. Wt	1.146 - 0.709				

a. Burt, W.H., R.P. Grossenheider. 1952. Field Guide to tbe Mammals. Riverside Pr
b. Chapman, J. A., G.A. Feldhamer. 1982. Wild Mammals of North America. John Ho
c, Novak, J.A. Baker, M.E. Obbard, B. Malloch. 1987. Wild Furbearer Management a
d. Soper, J.D. 1964. The Mammals of Alberta. Hamly Press. Edmonton.

D. FEED REQUIREMENTS

1. Fox

Using existing data (Boreal Ecology Services Ltd. 1984) on ranched silver fox, feeding requirements were estimated on a grams per unit of body weight basis (Table 4.1).

From the amounts feed / fox, and the growth curve for foxes (Table 3.1), a factor of g dry feed/g body weight for foxes was estimated for the twenty-six, two week periods of the year for each of the four age and sex categories: adult male breeders, adult female breeders, male and female pelters. (Tables 5.1, 5.2, 5.3, 5.4)

Where amounts of wet feed were used they were converted to an equivalent amount of dry feed by using a conversion factor of 0.35[1] (Nat. Res. Council 1982). (Note: This value is based on National rations and may be adjusted as per the Magrum experience, i.e. 50% increase when wet feed is used.)

2. Marten, Fisher and Lynx

It was assumed that nutritional requirements on a grams dry feed per gram body weight for marten, fisher and lynx during the period from birth to adult or pelting size would be similar to those for mink. (Dr. D.G. Chausow, National Milk Specialties Co. pers.comm.) To estimate the feeding requirement for each species, the 31 weeks of mink growth (from birth to adult size) was applied proportionately to the growth periods for marten (12 weeks), fisher (males 40 weeks, females 28 weeks), and lynx (males 71 weeks, females 59 weeks), respectively. For each stage in the growing period of each species, the metabolizable energy (ME) requirement for mink (Table 2) at an equivalent stage was used to calculate the amount of feed required.

For example:

Species	Age (weeks)	Equivalent age of mink (weeks)	Feed Requirement g/g body wt/day
Marten (male)	9	31/12 X 9 = 24	0.041
Marten (female)	9	31/12 X 9 = 24	0.050
Fisher (male)	9	31/40 X 9 = 7.2	0.073
Fisher (female)	9	31/28 X 9 = 10.29	0.093
Lynx (male)	9	31/71 x 9 = 4.1	0.050
Lynx (female)	9	31/59 x 9 ‘ 4.9	0.050

See Figures 7, 8, 9 and Tables 4.2, 4.3, 4.4.

Lynx do better on mink feed than fox feed but need the addition of a meat product (fresh or frozen) for palatability (Dr. D.G. Chausow, National Milk Specialties Co. pers.comm.) They do not care for a diet of pellets only. On this high protein diet they tend to form stones, and so require the addition of phosphoric acid at the rate of 2% of the solids (Dr. D.G. Chausow, National Milk Specialties Co. pers. comm.). These items and their costs have not been included in our estimates.

Calculations of the amounts of feed required were based on the ME values of the feed as supplied by the manufacturer (National Milk Specialties Co. Wisconsin) and the ME requirements of mink at various stages of their growth (Table 2).

The following mink feeds from National Milk Specialties Co. were used in estimating feed requirements for marten, fisher and lynx.

Product	Metabolizable Energy ME (kcal/g)
Mink maintenance regular	3.57
Mink lactation	3.59
Mink Early Growth	3.77
Mink Gro-Fur	3.50
Mink Reproduction	3.55

Example:
Mink males at 7 wks require 0.275 kcal/g body weight (Table 2).
Recommended feed at this stage = Early Growth (ME 3.770 kcal/g)

$$\frac{\text{g dry feed required}}{\text{g body wt.}} = \frac{0.275}{3.770} = 0.073 \frac{\text{g dry feed}}{\text{g body wt.}}$$

Estimates for marten, fisher, and lynx for their equivalent growth stage were based on these values (see Tables 2, 4.2, 4.3, 4.4).

The change from one type of feed to another for marten, fisher and lynx (eg. Early Growth to Gro-Fur) was based on approximate equivalent stages in growth and annual cycle as compared to mink. (Tables 4.2, 4.3, 4.4 and Figures 3, 4, 5, 6.) Using this method, weekly feeding costs for each species were estimated for each category: adult male breeders, adult female breeders, male pelters, and female pelters. A factor of 5 percent was added to the total feed consumption to allow for wastage. (Magrum Fur Farm, pers. comm.)

Experience and experimentation in a ranch setting will allow for adjusting the rations. The approach described here is used mainly to determine an understanding for feed costs in relation to fur market trends.

Table 2. Mink: Average Daily Requirements for Metabolizable Energy (ME) and Dry Feed for Growth.

Male Age in Weeks	Body weight g	ME daily required kcal	ME daily kcal/g. body wt.*	g dry feed/g body wt. /day EG	GF Main.	Reprod. Lact.
7	630	173	0.27	0.073		
9	930	307	0.33	0.088		
11	1240	394	0.32	0.084		
13	1520	445	0.29		0.084	
15	1730	435	0.25		0.072	
17	1900	439	0.23		0.066	
19	2040	441	0.22		0.062	
21	2160	436	0.20		0.058	
23	2260	387	0.17		0.049	
25	2330	336	0.14		0.041	
27	2350	323	0.14		0.039	
29	2380	284	0.12		0.034	
31	2380	278	0.12		0.033	

Female Age in Weeks	Body weight g	ME daily required kcal	ME daily kcal/g. body wt.*	g dry feed/g body wt. /day EG	GF Main.	Reprod. Lact.
7	450	126	0.28	0.074		
9	650	231	0.36	0.094		
11	810	284	0.35	0.093		
13	930	323	0.35		0.099	
15	1030	289	0.28		0.080	
17	1110	273	0.25		0.070	
19	1180	260	0.22		0.063	
21	1240	266	0.21		0.061	
23	1280	260	0.20		0.058	
25	1320	231	0.18		0.050	
27	1325	210	0.16		0.045	
29	1320	197	0.15		0.043	
31	1300	196	0.15		0.043	

* Based on values from Nat. Res. Council 1982.

EG = National Milk Specialties Mink Early Growth (ME 3.77 kcal/g)
GF = National Milk Specialties Mink Gro Fur (ME 3.5 kcal/g)
Main. = National Milk Specialties Mink Maintenance (ME = 3.57 kcal/g)
Reprod. = National Milk Specialties Mink Reproduction (ME = 3.55 kcal/g)
Lact. = National Milk Specialties Mink Lactation (ME = 3.59)

E. PELT PRODUCTION FEED COSTS

Feed prices were obtained from United Feeds in Edmonton, Alberta (Sept.89) for two feed types for fox:

Growing/Furring/Lactation at $620/tonne, (0.62/kg)
Maintenance/Reproduction at $564/tonne, (0.56/kg)
F.O.B. Edmonton

and from National Milk Specialties Co. in Wisconsin, for their products. Our estimates used the following feed costs:

	Us. $	Can. $
Mink maintenance regular	28.75 /cwt	0.76 /kg
Mink lactation	54.51 /cut	1.20 /kg
Mink Early Growth	46.62 /cut	1.03 /kg
Mink Gro-Fur	38.61 /cut	0.85 /kg
Mink Reproduction	52.00 /cwt	1.15 /kg

F.O.B. Wisconsin

Freight costs as quoted by National are $6.00 US /cut for truckload quantities to Edmonton. This is equivalent to $0.16 Can./kg.

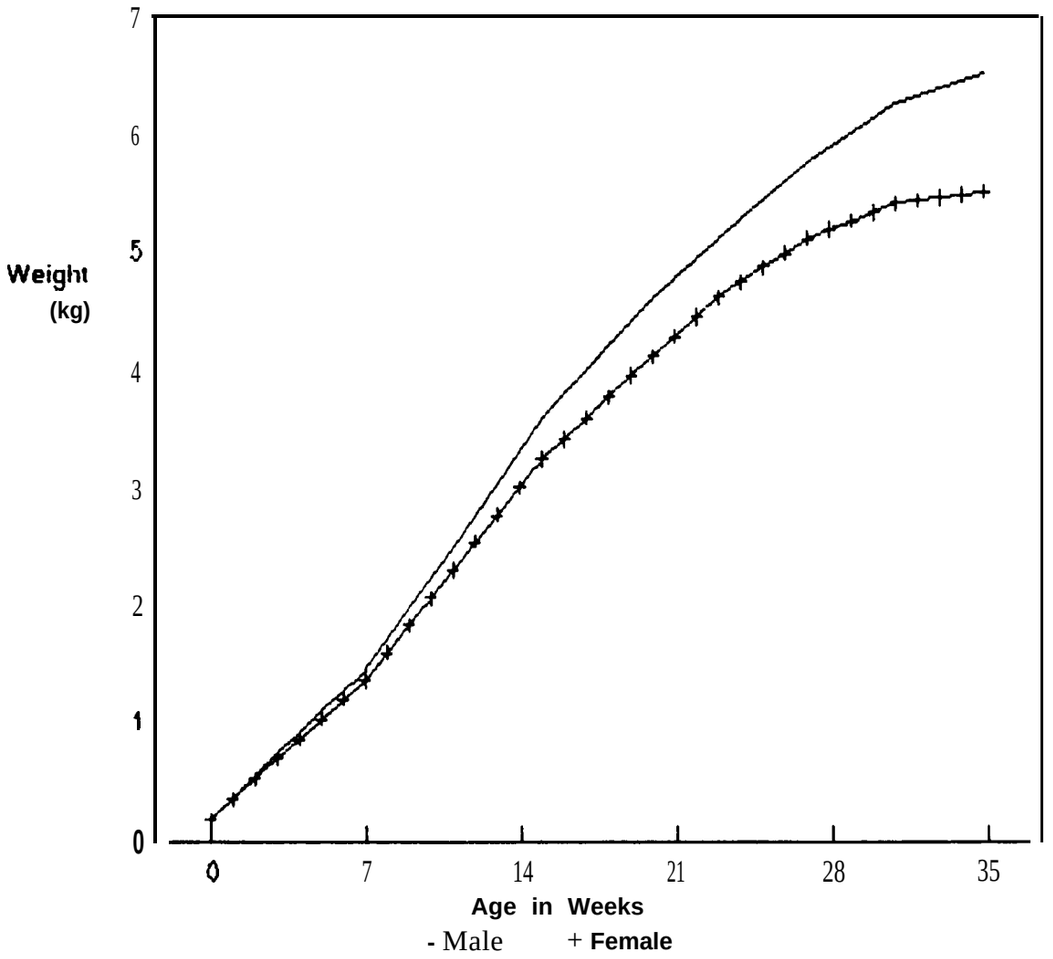
Freight costs from Edmonton to Hay River (0.39/kg) are calculated on dollars/tonne as quoted by Northwest Transport. effective 2 January . 1989. Quantities of one tonne were used in our estimates. These freight costs may be reduced with larger orders.

Table 3.1. Fox Growth Rate

Age (weeks)	Weight (g) Males		% increase Males	Weight (g) Females		% increase Females	Comments
0	180			180			Born
1	361		100.79	347		92.86	Nursing
2	543		50.20	514		48.15	Nursing
3	724		33.42	681		32.50	Begin Solids
4	906		25.05	849		24.53	
5	1087		20.03	1016		19.70	Start Weaning
6	1269		16.69	1183		16.46	
7	1450	*	14.30	1350	*	14.13	
8	1713		18.10	1588		17.59	Weaned
9	1975		15.33	1825		14.96	
10	2238		13.29	2063		13.01	
11	2500	*	11.73	2300	*	11.52	
12	2775		11.00	2538		10.33	
13	3050		9.91	2775		9.36	
14	3325		9.02	3013		8.56	
15	3600	*	8.27	3250	*	7.88	
16	3800		5.56	3425		5.38	
17	4000		5.26	3600		5.11	
18	4200		5.00	3775		4.86	
19	4400	*	4.76	3950	*	4.64	
20	4575		3.98	4113		4.11	
21	4750		3.83	4275		3.95	
22	4925		3.68	4438		3.80	
23	5100	*	3.55	4600	*	3.66	
24	5263		3.19	4725		2.72	
25	5425		3.09	4850		2.65	
26	5588		3.00	4975		2.58	
27	5750	*	2.91	5100	*	2.51	
28	5875		2.17	5175		1.47	
29	6000		2.13	5250		1.45	
30	6125		2.08	5325		1.43	
31	6250	*	2.04	5400	*	1.41	
32	6313		1.00	5425		0.46	
33	6375		0.99	5450		0.46	
34	6438		0.98	5475		0.46	
35	6500	*	0.97	5500	*	0.46	

* Values from Nutrient Requirements of Mink and Foxes. Nat. Res. Council 1982, All others are estimates using assumptions outlined in text, and data from Boreal Ecology Services Ltd. 1984.

Figure 2. Silver Fox Growth Curve



Values taken from Nutrient Requirements of Mink and Foxes. National Research Council. 1982.

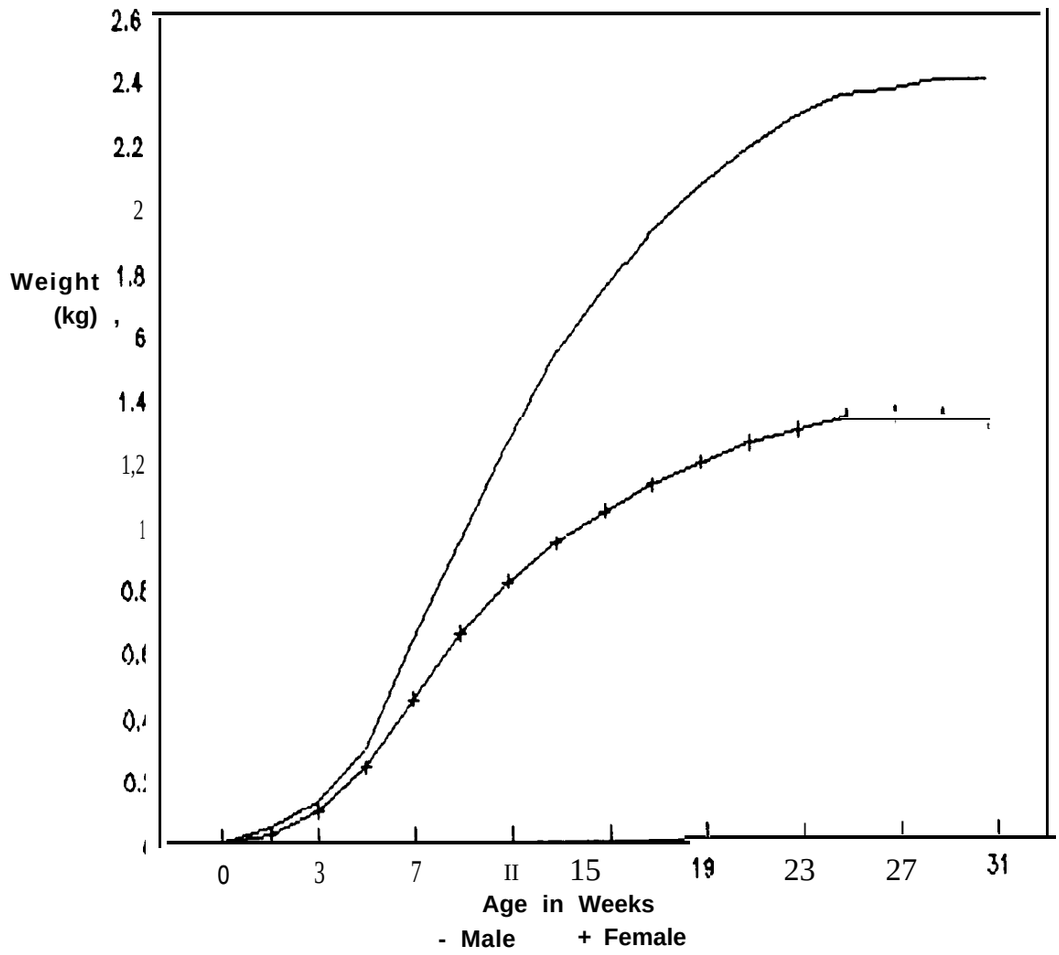
Table 3.2. Mink Growth Rate

Age (weeks)	Weight (g) Males	% increase Males	Weight (g) Females	8 increase Females	Comments
0	9 +		9 +		Nursing
1	50 *	455.56	30 *	233.33	Nursing
3	130 *	160.00	100 *	233.33	Begin solids
5	300 *	130.77	240 *	140.00	
7	630 *	110.00	450 *	87.50	
9	930 *	47.62	650 *	44.44	
11	1240 *	33.33	810 *	24.62	
13	1520 *	22.58	930 *	14.81	
15	1730 *	13.82	1030 *	10.75	
17	1900 *	9.83	1110 *	7.77	
19	2040 *	7.37	1180 *	6.31	
21	2160 *	5.88	1240 *	5.08	
23	2260 *	4.63	1280 *	3.23	
25	2330 *	3.10	1320 *	3.13	
27	2350 *	0.86	1325 *	0.38	
29	2380 *	1.28	1320 *	-0.38	
31	2380 *	0.00	1300 *	-1.52	

* Values from Nutrient Requirements of Mink and Foxes. Nat.Res. Council 1982.

+ Average value from Table la.

Figure 3. Mink Growth Curve



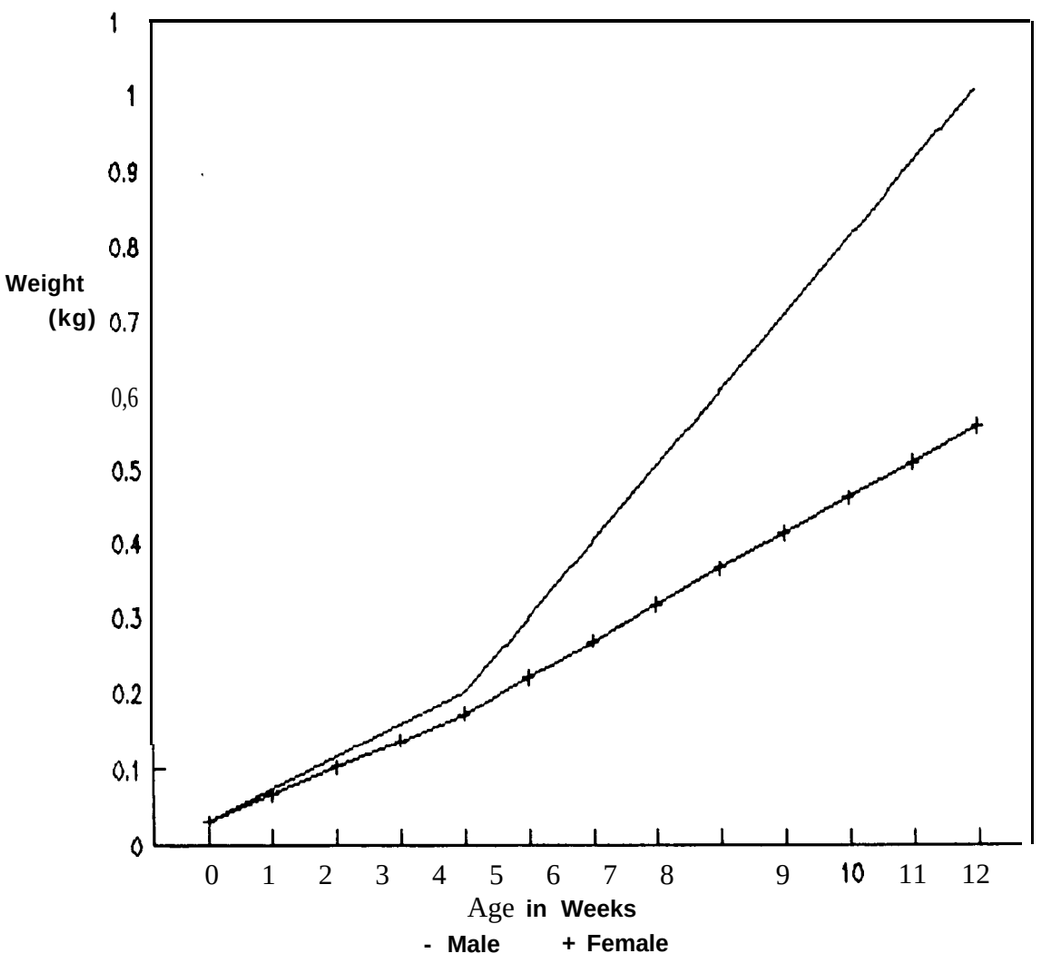
Values taken from Nutrient Requirements of Mink and Foxes. National Research Council. 1982.

Table 3.3. Marten Growth Rate

Age (weeks)	Weight (g) Ma 1 es	% increase Males	Weight (g) Females	% increase Females	Comments
0	28 *		28 *		Born
1	71	153.57	64	129.46	Nursing
2	114	60.56	101	56.42	
3	157	37.72	137	36.07	
4	200 *	27.39	173 *	26.51	
5	301	50.63	221	27.89	Start
6	403	33.61	270	21.81	weaning
7	504	25.16	318	17.90	
8	605	20.10	366	15.18	Weaned
9	706	16,74	414	13.18	
10	808	14.34	463	11.65	
11	909	12.54	511	10.43	
12	1010 *	11.14	559 *	9.45	

* Values from literature (see Table 1.) All others are estimates using assumptions outlined in text and in Table 1.

Figure 4. Marten Growth Rate



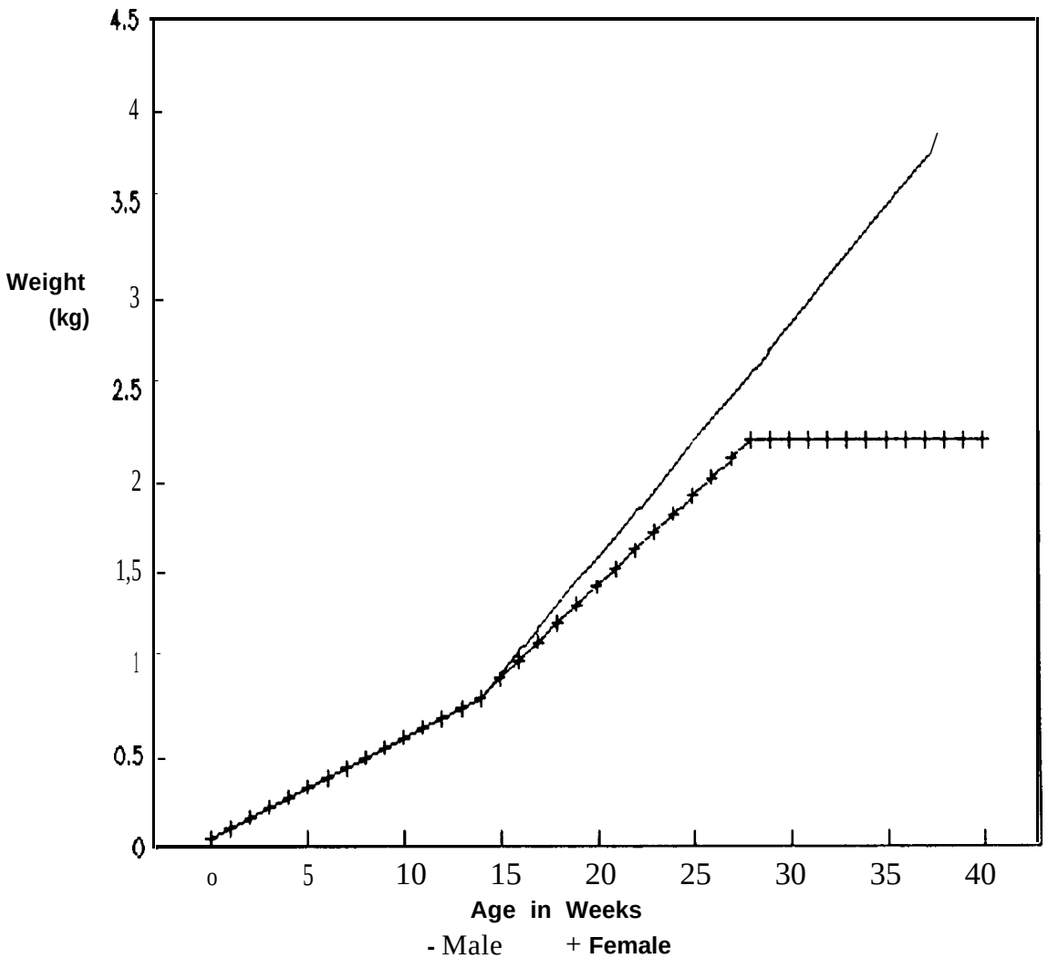
Calculated from values in Table 1. and Table 3.3

Table 3.4. Fisher Growth Rate

Age (weeks)	Weight (g) Males	% increase Males	Weight (g) Females	% increase Females	Comments
0	40 *		40 *		Born
1	94	135.71	94	135.71	Nursing
2	149	57.58	149	57.58	
3	203	36.54	203	36.54	
4	257	26.76	257	26.76	
5	311	21.11	311	21.11	Start
6	366	17.43	366	17.43	weaning
7	420	14.84	420	14.84	
8	474	12.93	474	12.93	Weaned
9	529	11.45	529	11.45	
10	583	10.27	583	10.27	
11	637	9.31	637	9.31	
12	691	8.52	691	8.52	
13	746	7.85	746	7.85	
14	800 *	7.28	800 *	7.28	
15	926	15.80	901	12.61	
16	1053	13.64	1002	11.20	
17	1179	12.00	1103	10.07	
18	1306	10.72	1203	9.15	
19	1432	9.68	1304	8.38	
20	1558	8.83	1405	7.73	
21	1685	8.11	1506	7.18	
22	1811	7.50	1607	6.70	
23	1937	6.98	1708	6.28	
24	2064	6.52	1809	5.91	
25	2190	6.12	1909	5.58	
26	2317	5.77	2010	5.28	
27	2443	5.46	2111	5.02	
28	2569 *	5.17	2212 *	4.78	
29	2696	4.92	2212	0.00	
30	2822	4.69	2212	0.00	
31	2949	4.48	2212	0.00	
32	3075	4.29	2212	0.00	
33	3201	4.11	2212	0.00	
34	3328	3.95	2212	0.00	
35	3454	3.80	2212	0.00	
36	3580	3.66	2212	0.00	
37	3707	3.53	2212	0.00	
38	3833	3.41	2212	0.00	
39	3960	3.30	2212	0.00	
40	4086	3.19	2212	0.00	

* Values from literature (see Table 1.) All others are estimates using assumptions outlined in-text and in Table 1.

Figure 5. Fisher Growth Rate



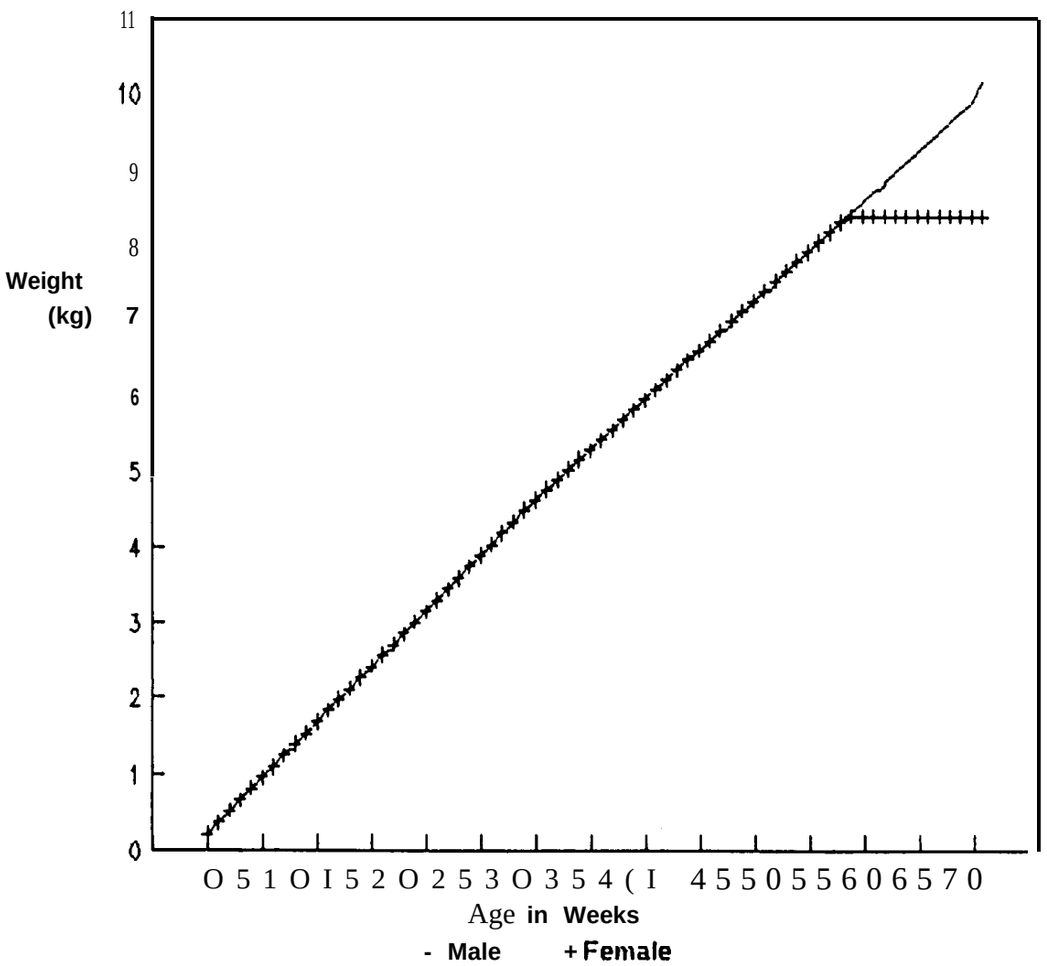
Calculated from values in Table 1. and Table 3.4.

Table 3.5. Lynx Growth Rate

Age (weeks)	Weight(g) Males	%increase Males	Height (g) Females	%increase Females	Age (weeks)	Weight(g) Males	%increase Males	Weight(g) Females	#increase Females
0	202 *		202 *		36	5423	2.49	5423	2.49
1	350	73.37	350	73,37	37	5554	2.43	5554	2.43
2	498	42.32	498	42.32	38	5686	2.37	5686	2.37
3	647	29.74	647	29.74	39	5818	2.32	5818	2.32
4	795	22.92	795	22.92	40	5950	2.27	5950	2.27
5	943	18.65	943	18.65	41	6081	2.22	6081	2.22
6	1091	15.72	1091	15.72	42	6213	2.17	6213	2.17
7	1239	13,58	1239	13.58	43	6345	2,12	6345	2.12
8	1388	11,96	1388	11,96	44	6477	2.08	6477	2.08
9	1536	10.68	1536	10.68	45	6609	2.03	6609	2.03
10	1684	9.65	1684	9.65	46	6740	1.99	6740	1.99
11	1832	8.80	1832	8.80	47	6872	1.96	6872	1.96
12	1980	8.09	1980	8.09	48	7004	1.92	7004	1.92
13	2129	7.48	2129	7.48	49	7136	1.88	7136	1,88
14	2277	6,96	2277	6.96	50	7268	1.85	7268	1.85
15	2425	6.51	2425	6.51	51	7399	1.81	7399	1.81
16	2573	6.11	2573	6.11	52	7531	1.78	7531	1.78
17	2722	5.76	2722	5.76	53	7663	1.75	7663	1.75
18	2870	5.45	2870	5.45	54	7795	1.72	7795	1.72
19	3018	5,16	3018	5.16	55	7927	1.69	7927	1.69
20	3166	4.91	3166	4.91	56	8058	1.66	8058	1.66
21	3314	4.68	3314	4,68	57	8190	1.64	8190	1,64
22	3463	4,47	3463	4.47	58	8322	1,61	8322	1.61
23	3611	4.28	3611	4.28	59	8454	1.58	8400 *	0.94
24	3759	4.10	3759	4.10	60	8586	1.56	8400	0.00"
25	3907	3.94	3907	3.94	61	8717	1.54	8400	0,00
26	4055	3.79	4055	3,79	62	8849	1.51	8400	0.00
27	4204	3,65	4204	3.65	63	8981	1.49	8400	0.00
28	4352	3,53	4352	3.53	64	9113	1.47	8400	0.00
29	4500 *	3.41	4500 *	3.41	65	9244	1.45	8400 "	0,00
30	4632	2.93	4632	2.93	66	9376	1.43	8400	0.00
31	4764	2.85	4764	2.85	67	9508	1.41	8400	0.00
32	4895	2.77	4895	2,77	68	9640	1.39	8400	0.00
33	5027	2.69	5027	2.69	69	9772	1,37	8400	0.00
34	5159	2,62	5159	2.62	70	9903	1.35	8400	0,00
35	5291	2.55	5291	2.55	71	10167 *	2,66	8400	0.00

* Values from literature (see Table 1,) All others are estimates using assumptions outlined in text and in Table 1. Growth rates were assumed to be the same for males and females resulting in females reaching adult size at 59 weeks and males at 71 weeks. (Available data on growth rates is highly variable. Growth rate is dependent on food supply,)

Figure 6. Lynx Growth Rate



Calculated from values in Table 1, and Table 3.5.

Table 4.1. Estimated food requirements for foxes from birth to pelting age.

Week	Males wt.*	g feed/ g body wt.	g feed/ animal*	Females wt.*	g feed/ g body wt.	g feed/ animal*	Comments
birth	180	0	0	180	0	0	Nursing
1/2	380	0	0	380	0	0	Nursing
3/4	740	0.014	10	740	0.014	10	Nursing
5/6	1150	0.039	45	1150	0.039	45	Nursing
7/8	1740	0.034	59	1500	0.024	36	Weaned
9/10	2280	0.055	125	2050	0.041	85	
11/12	2800	0.060	168	2600	0.052	136	
13/14	3390	0.055	185	3090	0.050	155	
15/16	3810	0.051	195	3400	0.048	163	
17/18	4230	0.050	210	3800	0.044	168	
19/20	4670	0.046	213	4200	0.040	168	
21/22	5000	0.042	210	4500	0.037	165	
23/24	5300	0.037	195	4800	0.032	154	
25/26	5620	0,033	185	5000	0.029	145	
27/28	5900	0.029	171.5	5200	0.026	135.8	
29/30	6200	0.021	132.65	5320	0.024	129.85	
31/32	6300	0.025	158.55	5350	0.024	126.7	Adult size
33/34	6300	0.025	154.7	5350	0.023	121.8	Adult size
35/36	6300	0.024	149.8	5350	0.022	119.7	Adult size

* Data from Boreal Ecology Services Ltd. 1984.

Table 4.2. Estimated food requirements for marten from birth to adult size.

Marten Age (weeks)	Equivalent Mink age = - (weeks)	ME (kcal/g body wt) Males	ME (kcal/g body wt) Females	g dry feed/g body wt. Males	g dry feed/g body wt. Females	Feed Type	Comments
0	0.0			0	0		Birth
1	2.6			0.020	0.020 est.		Nursing
2	5.2			0.040	0.040 est.		Nursing
3	7.8	0.275	0.280	0.073	0.074	EG	Nursing
4	10.3	0.330	0.355	0.088	0.094	EG	Nursing
5	12.9	0.293	0.347	0.078	0.092	EG	Nursing
6	15.5	0.251	0.281	0.067	0.074	EG	Nursing
7	18.1	0.231	0.246	0.061	0.065	EG	Weaned
8	20.7	0.216	0.220	0.062	0.063	GF	
9	23.3	0.171	0.203	0.049	0.058	GF	
10	25.8	0.144	0.175	0.041	0.050	GF	
11	28.4	0.137	0.158	0.039	0.045	GF	
12	31.0	0.117	0.151	0.033	0.043	GF	Adult size

Assumptions:

Marten will require approximately the same energy requirement/g body weight as mink at each stage in their growth. Mink take 31 weeks to reach adult size; Marten take 12 weeks to reach adult size. Therefore to estimate feed requirements for marten kits:

Multiplication factor of 31/12 x marten age in weeks to determine equivalent age of mink and the required metabolizable energy (ME) and level of feed required.

Values for g dry feed are based on Mink food from National Milk Specialties Co. and Metabolizable energy requirements (ME) values from Nat. Res. Council 1982.

Feed Type: National EG Early Growth (ME 3.770 kcal/g), GF Gro Fur (ME 3.500 kcal/g)

- Figure 7. Estimated Food Requirements for Marten

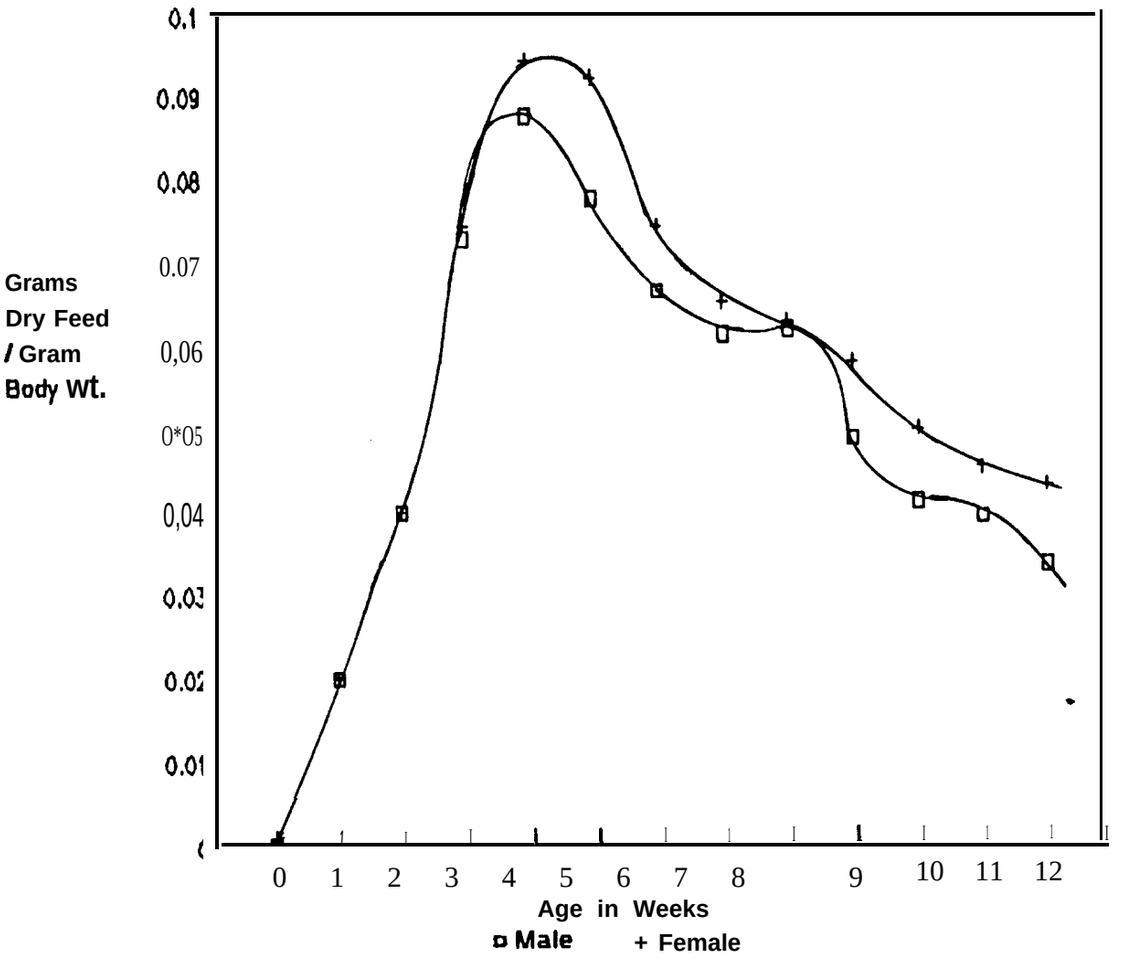


Table 4.3.a. Estimated daily food requirements for male fisher from birth to adult size.

Male Fisher Age (weeks)	Equivalent - Mink age (weeks)	ME (kcal/g body weight) Males	g dry feed/ g body wt. Males	Feed Type	Comments
0	0		0.000		Birth
1	0.78		0.000		Nursing
2	1.55		0.000		Nursing
3	2.33		0.000		Nursing
4	3.10		0.020 est.	EG	Nursing
5	3.88		0.030 est.	EG	Nursing
6	4.65		0.040 est.	EG	Nursing
7	5.43		0.050 est.	EG	Nursing
8	6.20		0.060 est.	EG	Weaned
9	6.98	0.275	0.073 .	EG	
10	7.75	0.275	0.073	EG	
11	8.53	0.275	0.073	EG	
12	9.30	0.330	0.088	EG	
13	10.08	0.330	0.088	EG	
14	10.85	0.318	0.084	EG	
15	11.63	0.318	0.084	EG	
16	12.40	0.318	0.091	GF	
17	13.18	0.293	0.084	GF	
18	13.95	0.293	0.084	GF	
19	14.73	0.293	0.084	GF	
20	15.50	0.251	0.072	GF	
21	16.28	0.251	0.072	GF	
22	17.05	0.231	0.066	GF	
23	17.83	0.231	0.066	GF	
24	18.60	0.231	0.066	GF	
25	19.38	0.216	0.062	GF	
26	20,15	0.216	0.062	GF	
27	20.93	0.216	0.062	GF	
28	21.70	0.202	0.058	GF	
29	22.48	0.202	0.058	GF	
30	23.25	0.171	0.049	GF	
31	24.03	0.171	0.049	GF	
32	24.80	0.171	0.049	GF	
33	25.58	0.144	0.041	GF	
34	26.35	0.144	0.041	GF	
35	27.13	0.137	0.039	GF	
36	27.90	0.137	0.039	GF	
37	28.68	0.137	0.039	GF	
38	29.45	0.119	0.034	GF	
39	30.23	0.119	0.034	GF	
40	31.00	0.117	0.033	GF	Adult size

Mink take 32 weeks to reach adult size; male fisher take 40 weeks to reach adult size, therefore to estimate feed requirements for kits: Mult.factor of 31/40 x fisher age in weeks to determine equivalent age of mink and the required metabolizable energy (ME) and level of feed required.

FeedType: National Milk Specialties Mink
E G Early Growth, GF Gro Fur

Table 4.3.b. Estimated daily food requirements for female fisher from birth to adult size.

Female Fisher Age (weeks)	Equivalent Mink age (weeks)	ME (kcal/g body weight) Females	g dry feed/ g body wt. Females	Feed Type	Comments
0	0				Birth
1	1.11				Nursing
2	2.21				Nursing
3	3.32				Nursing
4	4.43		0.020 est.	EG	Nursing
5	5.54		0.050 est.	EG	Nursing
6	6.64	0.280	0.074	EG	Nursing
7	7.75	0.280	0.074	EG	Nursing
8	8.86	0.355	0.094	EG	Weaned
9	9.96	0.355	0.094	EG	
10	11.07	0.351	0.093	EG	
11	12.18	0.351	0.093	EG	
12	13.29	0.347	0.092	EG	
13	14.39	0.347	0.092	EG	
14	15.50	0.281	0.075	EG	
15	16.61	0.281	0.075	EG	
16	17.71	0.246	0.070	GF	
17	18.82	0.246	0.070	GF	
18	19.93	0.246	0.070	GF	
19	21.04	0.215	0.061	GF	
20	22.14	0.215	0.061	GF	
21	23.25	0.203	0.058	GF	
22	24.36	0.203	0.058	GF	
23	25.46	0.175	0.050	GF	
24	26.57	0.175	0.050	GF	
25	27.68	0.158	0.045	GF	
26	28.79	0.158	0.045	GF	
27	29.89	0.149	0.043	GF	
28	31.00	0.151	0.043	GF	Adult size

Mink take 31 weeks to reach adult size; female fisher take 28 weeks to reach adult size, therefore to estimate feed requirements for kits: Mult.factor of 31/28 x fisher age in weeks to determine equivalent age of mink and the required metabolizable energy (ME) and level of feed required.

Feed Type: National Milk Specialties Mink
EG Early Growth, GF Gro Fur

Figure 8. Estimated Food Requirements for Fisher

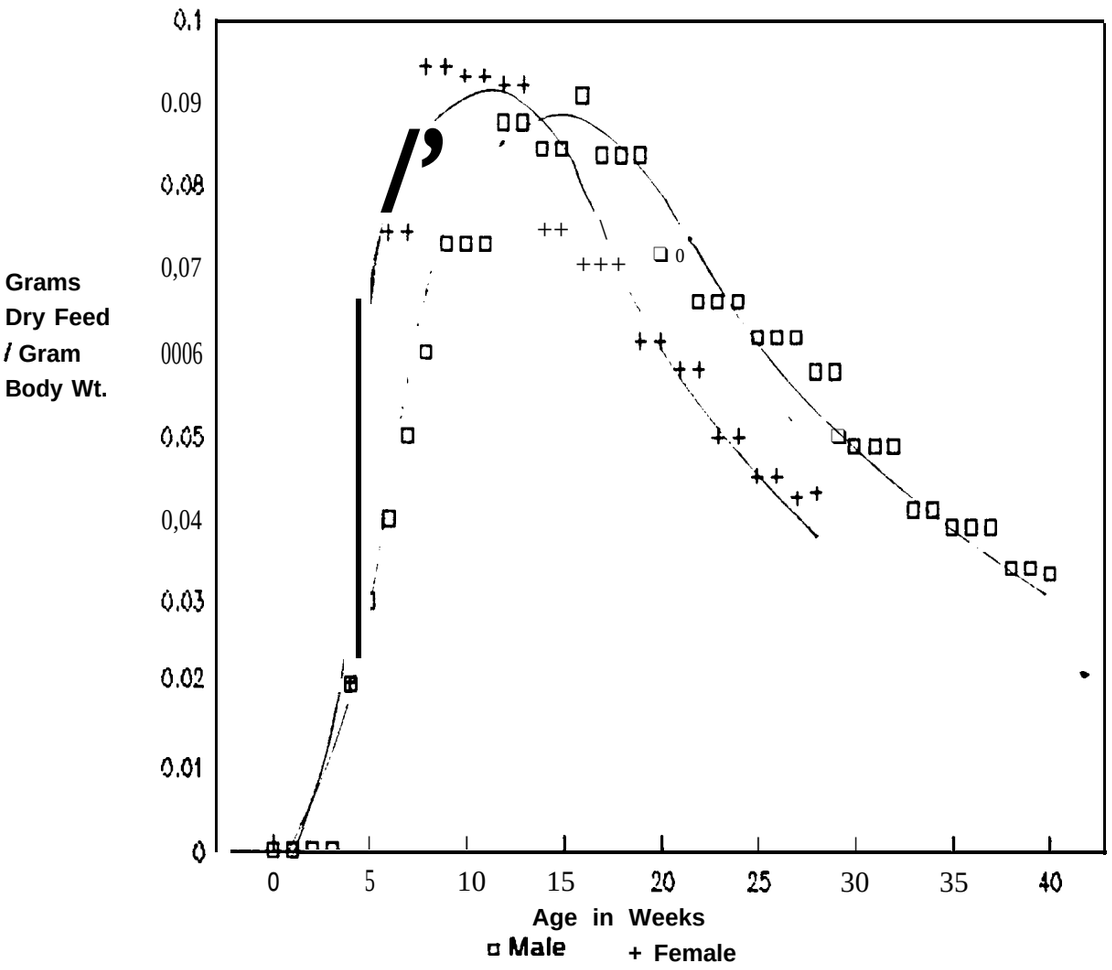


Table 4,4a. Estimated daily food requirements for male lynx from birth to adult size.

Hale Lynx Age (wks) **	Equivalent Hink age (weeks)	ME (kcal/ g body wt.) Mal es	g dry feed/ g body wt. Hal es	Feed Type	Hale Lynx Age (wks) **	Equivalent Mink age (weeks)	HE (kcal/ g body wt.) Mal es	g dry feed/ g body wt. Males	Fee Typ
1	0.4				37	16.2	0.251	0,072	GF
2	0.9				38	16,6	0.251	0.072	GF
3	1.3				39	17.0	0.231	0.066	GF
4	1.7				40	17.5	0.231	0.066	GF
5	2.2				41	17,9	0.231	0.066	GF
6	2.6				42	18.3	0.231	0.066	GF
7	3.1		0,020 est.	EG	43	18.8	0.231	0.066	GF
8	3.5		0.030 est.	EG	44	19,2	0,216	0.062	GF
9	3.9		0.040 est.	EG	45	19.6	0,216	0,062	GF
10	4,4		0.050 est.	EG	46	20.1	0.216	0.062	GF
11	4.8		0.060 est.	EG	47	20.5	0.216	0.062	GF
12	5.2		0.070 est.	EG	48	21.0	0,202	0.058	GF
13	5*7		0.070 est.	EG	49	21.4	0.202	0.058	GF
14	6.1		0.070 est.	EG	50	21.8	0.202	0.058	GF
15	6.5	0,275	0.073	EG	51	22.3	0,202	0.058	GF
16	7.0	0.275	0.073	EG	52	22,7	0.202	0.058	GF
17	7.4	0.275	0.073	EG	53	23,1	0.171	0,049	GF
18	7.9	0.275	0.073	EG	54	23,6	0.171	0.049	GF
19	8.3	0.275	0.073	EG	55	24,0	0,171	0.049	GF
20	8.7	0.275	0.073	EG	56	24.5	0.171	0.049	GF
21	9.2	0.330	0.088	EG	57	24,9	0.171	0.049	GF
22	9.6	0.330	0,088	EG	58	25.3	0.144	0.041	GF
23	10.0	0.330	0.088	EG	59	25.8	0.144	0.041	GF
24	10.5	0,330	0.088	EG	60	26.2	0.144	0.041	GF
25	10.9	0,330	0.088	EG	61	26.6	0.144	0.041	GF
26	11.4	0,318	0.084	EG	62	27.1	0.137	0.039	GF
27	11.8	0.318	0.084	EG	63	27. $	0.137	0.039	GF
28	12,2	0.318	0,084	EG	64	27.9	0.137	0.039	GF
29	12.7	0.318	0,084	EG	65	28.4	0.137	0.039	GF
30	13,1	0,293	0.078	EG	66	28.8	0.137	0.039	GF
31	13,5	0,293	0.084	GF	67	29.3	0.119	0.034	GF
32	14.0	0,293	0.084	GF	68	29.7	0.119	0.034	GF
33	14.4	0.293	0.084	GF	69	30.1	0.119	0.034	GF
34	14.8	0.293	0.084	GF	70	30,6	0.119	0.034	GF
35	15.3	0.251	0.072	GF	71	31.0	0.117	0.033	GF

Mink take 31 weeks to reach adult size; male lynx take about 71 weeks to reach adult size. Therefore to estimate feed requirements for male kits: apply a multiplication factor of 31/71 x lynx age in weeks to determine the equivalent age of mink and the required metabolizable energy (ME) and level of feed required,

Feed Type: National Mink Specialties Mink EG Early Growth (HE 3.770 kcal/g) GF Gro Fur (ME 3.500 kcal/g)

** Lynx age in weeks does not correspond to the week number in the annualcycle due to a later average whelping date than fox, marten and fisher.

Table 4.4.b. Estimated daily food requirements for female lynx from birth to adult size.

Female Lynx Age (wks) **	Equivalent Mink age (weeks)	Daily ME (kcal/ g dry feed/ g body wt.) Females	Daily feed/ g body wt. Females	Feed Type	Female Lynx Age (wks) **	Equivalent Mink age (weeks)	Daily ME (kcal/ g dry feed/ g body wt.) Fema 1 es	Daily g body wt." Females	Feed Type
1	0,5				37	19.4	0.220	0,063	GF
2	1.1				38	20.0	0.220	0,063	GF
3	1.6				39	20.5	0.220	0.063	GF
4	2.1				40	21.0	0.215	00061	GF
5	2.6				41	21.5	0.215	0.061	GF
6	3.2				42	22.1	0.215	0.061	GF
7	3.7		0.010 est.	EG	43	22.6	0.215	0,061	GF
8	4.2		0.020 est.	EG	44	23.1	0.203	0.058	GF
9	4.7		0.030 est.	EG	45	23,6	0.203	0,058	GF
10	5.3		0.040 est.	EG	46	24.2	0.203	0.058	GF
11	5.8		0.050 est.	EC	47	24.7	0.203	0,058	GF
12	6,3		0.060 est.	EG	48	25.2	0.175	0.050	GF
13	6.8		0.070 est.	EG	49	25.7	0.175	0.050	GF
14	7.4	0,28	0.074	EG	50	26.3	0,175	0.050	GF
15	7.9	0,28	0,074	EG	51	26.8	0.175	0.050	GF
16	8.4	0.28	0,074	EG	52	27.3	0.158	0.045	GF
17	8.9	0.28	0.074	EG	53	27.8	0.158	0.045	GF
18	9.5	0.355	0,094	EG	54	28.4	0.158	0.045	GF
19	10,0	0,355	0.094	EG	55	28.9	0.158	0.045	GF
20	10.5	0.355	0.094	EG	56	29.4	0.149	0.043	GF
21	11,0	0.351	0.093	EG	57	29.9	0.149	0.043	GF
22	11.6	0.351	0.093	EG	58	30.5	0,149	0,043	GF
23	12.1	0.351	0.093	EG	59	31.0	0.151	0.043	GF
24	12.6	0,351	0.093	EG					
25	13.1	0,347	0.092	EG					
26	13.7	0,347	0.099	GF					
27	14,2	0,347	0,099	GF					
28	14.7	0,347	0.099	GF					
29	15.2	0.281	0.080	GF					
30	15.8	0.281	0.080	GF					
31	16.3	0.281	0.080	GF					
32	16.8	0.281	0.080	GF					
33	17.3	0.246	0.070	GF					
34	17.9	0.246	0.070	GF					
35	18.4	0.246	0.070	GF					
36	18.9	0.246	0.070	GF					

Mink take 31 weeks to reach adult size; female lynx take about 59 weeks to reach adult size if their growth rate from week 29 on is similar to that of males. Therefore to estimate feed requirements for female kits: apply a multiplication factor of 32/59 x lynx age in weeks to determine the equivalent age of mink and the required metabolizable energy (ME) and level of feed required.

Feed Type: National Mink Specialties Mink EG Early Growth (ME 3.770 kcal/g) GF Gro Fur (ME 3.500 kcal/g).

** Lynx age in weeks does not correspond to the week number in the annual cycle due to a later average whelping date than fox, marten and fisher.

- Figure 9. Estimated Food Requirements for Lynx

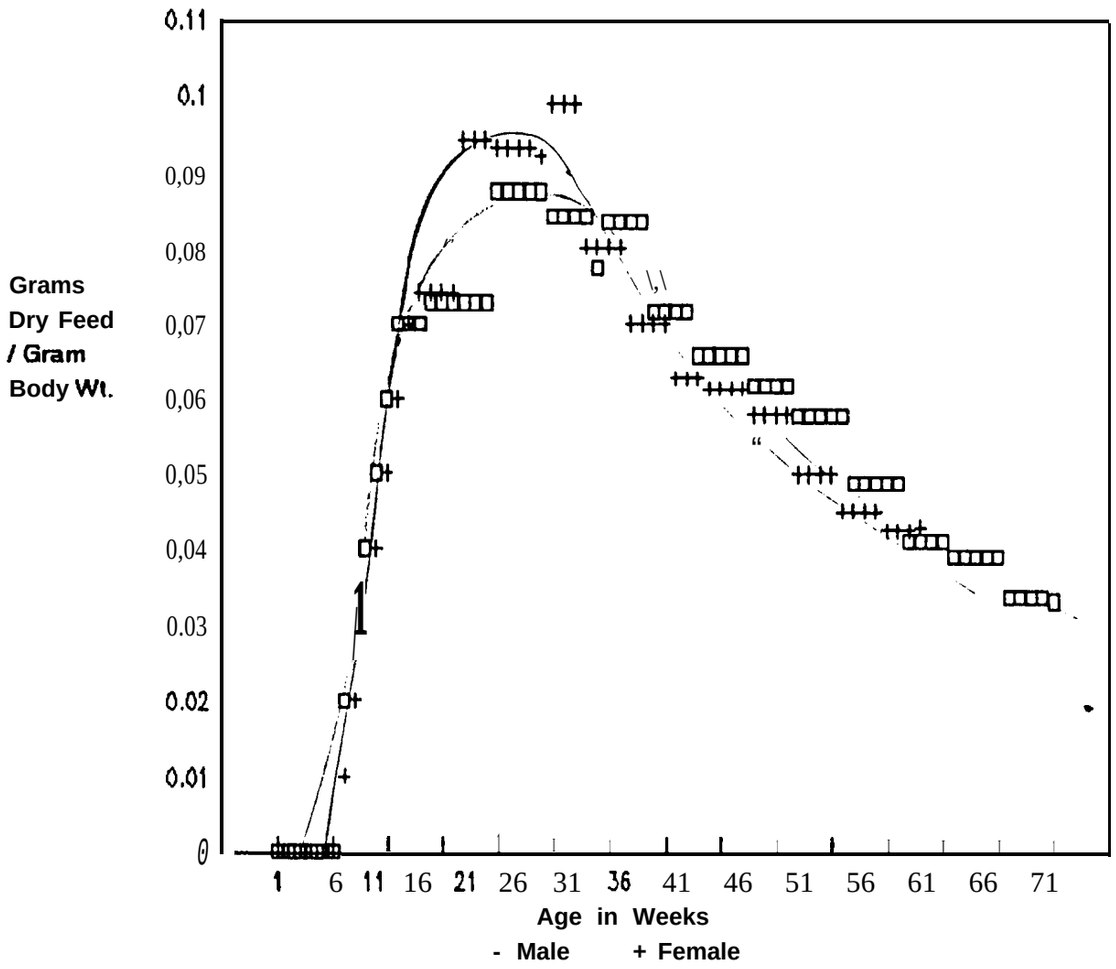


Table 5.1. Weekly feed costs to maintain breeding male fox for on

Fox	Week	Number of Animals	Av. body Height	Feed type	g dry feed /g body wt.
		Breeding Males			
April	1/2	1	6300	dry	0.025
	3/4	1	6300	dry	0,025
May	5/6	1	6300	dry	0,025
	7/8	1	6300	dry	0.025
June	9/10	1	6300	dry	0,025
	11/12	1	6300	dry	0,025
July	13/14	1	6300	dry	0,025
	15/16	1	6300	dry	0.025
	17/18	1	6300	dry	0,025
Aug	19/20	1	6300	dry	0.025
	21/22	1	6300	dry	0.025
Sept	23/24	1	6300	dry	0,025
	25/26	1	6300	dry	0.025
Ott	27/28	1	6300	dry	0.025
	29/30	1	6300	dry	0,025
	31/32	1	6300	dry	0.025
Nov	33/34	1	6300	dry	0.025
pelting	35/36	1	6300	dry	0.025
Dec	37/38	1	6300	wet	0.025
	39/40	1	6300	wet	0.025
Jan	41/42	1	6300	wet	0.025
	43/44	1	6300	wet	0.025
Feb	45/46	1	6300	wet	0.025
	47/48	1	6300	wet	0,025
Mar	49/50	1	6300	wet	0.025
	51/52	1	6300	wet	0,025

* Data from Boreal Ecology Services Ltd. 1984 with 1990 feed and

** Cumulative totals to show progressive cost of maintenance.

Table 5.2. Weekly feed costs to maintain breeding female fox for one year.*

Fox	Female Breeders Week	Number of Animals	Av. body Weight g	Feed Type	g dry feed /g body wt.	Daily Consumption g dry feed (body wt x g feed/g body wt)	Total Consump. kg (daily x 14) (x # /1000)	Plus 5% wastage factor	Feed Cost /kg	Freight Cost $/kg	Cumulative Total cost
April (born)	0	1	5350	wet	lactating		0	0,00	0,62	0.39	0.00
	1/2	1	5350	wet	lactating	220.50	3.09	3.24	0,62	0,39	3.27
(begin feed)	3/4	1	5350	wet	lactating	234.50	3.28	3.45	0.62	0,39	6.76
Hay	5/6	1	5350	wet	lactating	245.00	3.43	3.60	0,62	0,39	10,39
(weaned)	7/8	1	5350	wet	lactating	288.75	4.04	4.24	0.62	0.39	14.68
June	9/10	1	5350	dry	0,022	120	1.68	1.76	0,564	0.39	16.36
	11/12	1	5350	dry	0,022	120	1.68	1.76	0.564	0,39	18.05
July	13/14	1	5350	dry	0,022	120	1,68	1,76	0,564	0,39	19.73
	15/16	1	5350	dry	0.022	120	1.68	1,76	0,564	0.39	21.41
	17/18	1	5350	dry	0,022	120	1.68	1.76	0.564	0,39	23.09
Aug	19/20	1	5350	dry	0,022	120	1.68	1.76	0,564	0.39	24.78
	21/22	1	5350	dry	0.022	120	1.68	1.76	0.564	0,39	26.46
Sept	23/24	1	5350	dry	0,022	120	1.68	1,76	0.564	0.39	28.14
	25/26	1	5350	dry	0.022	120	1.68	1.76	0,564	0,39	29,83
Ott	27/28	1	5350	dry	0.022	120	1.68	1.76	0.564	0.39	31.51
	29/30	1	5350	dry	0.024	127	1.78	1.87	0.564	0.39	33.29
	31/32	1	5350	dry	0.024	127	1.78	1.87	0.564	0.39	35,07
Nov	33/34	1	5350	dry	0.022	120	1,68	1.76	0.564	0,39	36,75
	35/36	1	5350	dry	0.022	120	1.68	1.76	0,564	0,39	38.44
Dec	37/38	1	5350	wet	0.022	119	1.67	1.75	0.564	0,39	40.11
	39/40	1	5350	wet	0.022	119	1.67	1.75	0,564	0,39	41.77
Jan	41/42	1	5350	wet	0.022	119	1.67	1.75	0,564	0.39	43,44
	43/44	1	5350	wet	0.022	119	1.67	1.75	0.564	0,39	45.11
Feb	45/46	1	5350	wet	0.022	119	1.67	1.75	0.564	0.39	46.78
	47/48	1	5350	wet	pregnant	152.25	2.13	2.24	0,62	0,39	49.04
Mar	49/50	1	5350	wet	pregnant	187.25	2,62	2.75	0,62	0,39	51.82
	51/52	1	5350	wet	pregnant	213.50	2,99	3.14	0.62	0.39	54,99
						Total:	53.63 kg	56.31 kg			54.99 TOTAL COST

* Data from Boreal Ecology Services Ltd. 1984 with 1990 feed and freight costs.

** Cumulative totals to show progressive cost of maintenance.

Table 5.3, Weekly feed costs to raise male fox from birth to pelting.*

FOX	Male Pelters Week	Number of Animals	Av. body Height	Feed g Type	g dry feed /g body wt.	Daily Consumption g dry feed (body wt x g feed/g body wt)	Total Consump. kg (daily x 14) (x # /1000)	Plus 5% wastage factor	Feed Cost /kg	Freight cost $/kg	Cumulative Total Cost
April (born)	O	1	180	none	0	0	0.00	0.00	0.62	0.39	0,00
	1/2	1	380	none	0	0	0,00	0,00	0,62	0,39	0.00
(begin feed)	3/4	1	740	dry	0,014	10.00	0.14	0.15	0.62	0,39	0.15
May	5/6	1	1150	dry	0,039	45,00	0,63	0,66	0.62	0,39	0.82
(weaned)	7/8	1	1740	dry	0.034	59.00	0.83	0.87	0.62	0.39	1,69
June	9/10	1	2290	dry	0.055	125.00	1,75	1.84	0.62	0.39	3.55
(separate)	11/12	1	2800	dry	0,060	168.00	2.35	2.47	0.62	0,39	6.04
July	13/14	1	3390	dry	0,055	185,00	2,59	2,72	0,62	0,39	8,79
	15/16	1	3810	dry	0.051	195.00	2,73	2.87	0.62	0.39	11.68
	17/13	1	4230	dry	0.050	210.00	2.94	3.09	0.62	0,39	14.90
Aug	19/20	1	4670	dry	0.046	213.00	2.98	3,13	0.62	0.39	17.96
	21/22	1	5000	dry	0,042	210.00	2,94	3,09	0.62	0,39	21.08
Sept	23/24	1	5300	dry	0.037	195.00	2.73	2.87	0.62	0.39	23.98
	25/26	1	5620	dry	0.033	185.00	2.59	2.72	0.62	0.39	26.72
Ott	27/28	1	5900	wet	0,029	171.50	2.40	2.52	0,62	0,39	29.27
	29/30	1	6200	wet	0.021	132,65	1.86	1.95	0,62	0.39	31.24
	31/32	1	6300	wet	0.025	158,55	2.22	2.33	0.62	0.39	33.59
Nov	33/34	1	6300	wet	0.024	151.20	2,12	2,22	0.62	0.39	35.84
(pelting)	35/36	1	6300	wet	0,024	149.80	2.10	2.20	0,62	0.39	38.06
						Total:	35.89 kg	37.69 kg			38.06 TOTAL COST

* Data from Boreal Ecology Services Ltd. 1984 with 1990 feed and freight costs.

** Cumulative totals to show progressive cost of maintenance.

Table 5.4. Weekly feed costs to raise female fox from birth to pelting,*

FOX	Female Pelters Week	Number Of Animals	Av. body Weight g	Feed Type	g dry feed /g body wt.	Daily Consumption g dry feed (body wt x g feed/g body wt)	Total Consump. kg (daily x 14) (x # /1000)	Plus 5% wastage factor	Feed Cost /kg	Freight cost $/kg	Cumulative Total cost
April (born)	O	1	180	none	0	0	0,00	0.00	0.62	0,39	0.00
	1/2	1	380	none	0	0	0,00	0,00	0.62	0,39	0,00
(begin feed)	3/4	1	740	dry	0.014	10	0.14	0.15	0,62	0,39	0,15
May	5/6	1	1150	dry	0.039	45	0.63	0,66	0,62	0,39	0,82
(weaned)	7/8	1	1500	dry	0,024	36	0,50	0053	0.62	0.39	1.35
June	9/10	1	2050	dry	0.041	85	1.19	1.25	0.62	0.39	2.61
(separate)	11/12	1	2600	dry	0.052	136	1.90	2.00	0.62	0.39	4.63
July	13/14	1	3090	dry	0.050	155	2,17	2,28	0.62	0,39	6,93
	15/16	1	3400	dry	0,048	163	2.28	2.40	0.62	0.39	9,35
	17/18	1	3800	dry	0,044	168	2.35	2,47	0,62	0,39	11.85
Aug	19/20	1	4200	dry	0.040	168	2,35	2,47	0.62	0.39	14.34
	21/22	1	4500	dry	0.037	165	2,31	2.43	0.62	0.39	16,79
Sept	23/24	1	4800	dry	0,032	154	2.16	2.26	0.62	0.39	19.08
	25/26	1	5000	dry	0.029	145	2.03	2,13	0.62	0,39	21.23
Ott	27/28	1	5200	wet	0,026	136	1.90	2.00	0.62	0.39	23.25
	29/30	1	5320	wet	0)024	130	1.82	1.91	0.62	0.39	25,18
	31/32	1	5350	wet	0,024	127	1.77	1,86	0.62	0,39	27.06
Nov	33/34	1	5350	wet	0.023	122	1.71	1,79	0.62	0.39	28.86
(pelting)	35/36	1	5350	wet	0.022	120	1.68	1,76	0.62	0.39	30.64
						Total:	28.89 kg	30,34 kg			30.64 TOTAL COST

* Data from Boreal Ecology Services Ltd. 1984 with 1990 feed and freight costs,

** Cumulative totals to show progressive cost of maintenance.

Table 5.S. **Costs** of maintaining a Fox breeding unit **and** its Offspring to pelting.

Type	Number	Feed Cost /animal *	Feed cost Subtotal	cost of Disease Control /animal **	Disease Control Subtotal	Total
Breeding Male	1	57.43	57.43	5.00	5.00	62.43
Breeding Female	3	54.99	164.97	5,00	15.00	179.97
Male Pelters	4.5	38.06	171.27	5.00	22.50	193.77
Female Pelters	4.5	30.64	137.88	5.00	22.50	160.38
Total production cost per breeding unit of 1 male : 3 females						596,55
Total production cost of feed and medicine per fox pelt:						66.28
Using artificial insemination:						
Breeding Male	1	57.43	57.43	5.00	5.00	62.43
Breeding Female	10	54.99	549.90	5.00	50.00	599.90
Male Pelter	15.0	38.06	570.90	5.00	75.00	645.90
Female Pelter	15.0	30.64	459.60	5*00	75.00	**534.60**
Total production cost per breeding unit of 1 male : 10 females						1,842.83
Total production cost of feed and medicine Rer fox pelt using artificial insemination:						61.42

Table 6.1. Weekly feed costs to maintain marten breeding males for one year.

MARTEN	Breeding Males Week	Number of Animals	Av. body Weight g	Feed * Type	g dry feed /g body wt.	Daily Consumption g dry feed (body wc x g feed/g body wt)	Total Consump. kg (daily x 14) (x # /1000)	Plus 5% wastage factor	Feed Cost /kg	Freight cost $/kg	Cumulative Total Cost
April (born)	0	1	1010	none	0.000	0,00	0,00	0,00	0.76	0.55	0,00
	1/2	1	1010	dry main	0.033	33,10	0,46	0,49	0,76	0,55	0.63
(begin feed)	3/4	1	1010	dry main	0.033	33,10	0,46	0.49	0,76	0.55	1.27
May	5/6	1	1010	dry main	0.033	33.10	0,46	0.49	0,76	0.55	1.90
(weaned)	7/8	1	1010	dry main	0.033	33.10	0,46	0.49	0.76	0.55	2.54
June	9/10	1	1010	dry main	0,033	33,10	0,46	0.49	0,76	0.55	3.17
(adult size)	11/12	1	1010	dry main	0,033	33.10	0.46	0.49	0,76	0,55	3.81
July	13/14	1	1010	dry main	0.033	33.10	0.46	0,49	0.76	0.55	4.44
	15/16	1	1010	dry main	0,033	33.10	0.46	0,49	0,76	0,55	5,08
	17/19	1	1010	dry main	0.033	33.10	0,46	0.49	0,76	0.55	5.71
Aug	19/20	1	1010	dry main	0,033	33,10	0.46	0.49	0.76	0.55	6,35
	21/22	1	1010	dry main	0.033	33,10	0.46	0,49	0.76	0.55	6.98
Sept	23/24	1	1010	dry main	0.033	33.10	0.46	0.49	0.76	0.55	7.62
	25/26	1	1010	dry main	0.033	33,10	0.46	0,49	0.76	0,55	8.25
Ott	27/28	1	1010	dry main	0.033	33.10	0.46	0.49	0.76	0.55	8,89
	29/30	1	1010	dry main	0,033	33.10	0.46	0.49	0.76	0.55	9,52
	31/32	1	1010	dry main	0.033	33,10	0.46	0.49	0.76	0.55	10,16
Nov	33/34	1	1010	dry main	0,033	33,10	0.46	0.49	0,76	0.55	10.79
(pelting)	35/36	1	1010	dry main	0,033	33.10	0,46	0,49	0.76	0.55	11.43
Dec	37/38	1	1010	dry main	0.033	33.10	0.46	0.49	0.76	0.55	12.06
	39/40	1	1010	wet main	0,033	33.10	0,46	0,49	0.76	0.55	12.70
Jan	41/42	1	1010	wet main	0.033	33.10	0,46	0.49	0,76	0,55	13.33
	43/44	1	1010	wet main	0,033	33.10	0,46	0.49	0,76	0,55	13,97
Feb	45/46	1	1010	wet main	0.033	33.10	0,46	0.49	0.76	0.55	14,63
	47/48	1	1010	wet main	0.033	33,10	0.46	0,49	0,76	0,55	15.24
Mar	49/50	1	1010	wet main	0,033	33.10	0,46	0,49	0.76	0.55	15.87
	51/52	1	1010	wet main	0,033	33.10	0.46	0.49	0.76	0,55	16.51
					Total:		12.05 kg	12.65 kg			16.51 TOTAL COST

* National mink maintenance pellets (ME 3.570 kcal/g) used for estimates.

**Cumulative totals to show progressive cost of maintenance.

Table 6,2. Weekly feed costs to maintain marten breeding females for one year.

MARTEN	Breeding Females					Daily Consumption g dry feed	Total Consump, kg	Plus			
	Week	Number of Animals	Av. body Weight g	Feed * Type	g dry feed /g body wt.	(body wt x g feed/g body wt)	(daily x 14) (x # /1000)	5% wastage factor	Feed Cost /kg	Freight cost $/kg	Cumulative Total cost
April (born)											
	1/2	1	lact.	wet lact	0.097 **	54.50	0.76	0.80	1.20	0.55	1.40
	3/4	1	lact.	wet lact	0,097 **	54.50	0,76	0,80	1.20	0,55	2.80
May	5/6	1	lact.	wet lact	0,097 **	54.50	0.76	0,80	1,20	0.55	4.20
(weaned)	7/8	1	lact.	wet lact	0.097 **	54.50	0.76	0.80	1.20	0,55	5.60
June	9/10	1	559	dry main	0.042	23.64	0,33	0,35	0,76	0.55	6.06
	11/12	1	559	dry main	0.042	23.64	0,33	0.35	0.76	0,55	6.51
July	13/14	1	559	dry main	0.042	23.64	0.33	0.35	0.76	0,55	6.96
	15/16	1	559	dry main	0,042	23.64	0.33	0.35	0.76	0,55	7,42
	17/18	1	559	dry main	0.042	23.64	0.33	0.35	0.76	0,55	7.87
Aug	19/20	1	559	dry main	0.042	23.64	0.33	0.35	0,76	0,55	9.33
	21/22	1	559	dry main	0,042	23.64	0.33	0,35	0.76	0.55	8.78
Sept	23/24	1	559	dry main	0.042	23.64	0.33	0,35	0.76	0,55	9.23
	25/26	1	559	dry main	0,042	23.64	0.33	0,35	0.76	0,55	9.69
Oct	27/23	1	559	dry main	0.042	23.64	0.33	0,35	0,76	0.55	10.14
	29/30	1	559	dry main	0,042	23.64	0.33	0.35	0.76	0,55	10.59
	31/32	1	559	dry main	0,042	23,64	0.33	0,35	0,76	0.55	11,05
Nov	33/34	1	559	dry main	0.042	23.64	0,33	0.35	0,76	0,55	11,50
(pelting)	35/36	1	559	dry main	0,042	23.64	0,33	0,35	0.76	0.55	11.95
Dec	37/38	1	559	wet main	0.042	23,64	0.33	0.35	0.76	0,55	12.41
	39/40	1	559	wet main	0.042	23.64	0.33	0.35	0.76	0.55	12.86
Jan	41/42	1	559	wet main	0.042	23.64	0,33	0.35	0.76	0,55	13.31
	43/44	1	559	wet main	0,042	23.64	0,33	0.35	0.76	0.55	13.77
Feb	45/46	1	559	wet main	0,042	23.64	0,33	0.35	0,76	0,55	14.22
	47/48	1	559	wet main	0.042	23.64	0.33	0,35	0.76	0.55	14.68
Mar	49/50	1	active	wet repro	0,056 **	31.49	0.44	0,46	1.15	0,55	15.46
	51/52	1	gest.	wet repro	0.056 **	31.49	0.44	0.46	1,15	0,55	16.24
						Total:	10.55 kg	11.08 kg			16.24 TOTAL COST

Gestation requires ,200 kcal/g body wt. Lactation requires an av. of .350 kcal/g/body wt.

* National mink lactation (ME 3.590 kcal/g), reproduction (ME 3.550 kcal/g), maintenance (ME 3.570 kcal/g)

** Cumulative totals to show progressive cost of maintenance

costs to raise male marten from birth to pelting.

ales Number of Animals	Av. body Weight g	Feed * Type	g dry feed /g body wt.	Daily Consumption g dry feed (body wt x g feed/g body wt)	Total Consump. kg (daily x 14 (x # / ° °)	Plus 5% wastage factor	Feed Cost /kg	Freight Cost $/kg	Cumulative Total Cost
1	28	none	° ° °	0.00	°.00	°.00	° °	° 5	° °
2 1	114	dry EG	0.040 est	4.56	°.06	°.07	1.03	°.55	0.11
4 1	200	dry EG	0.088	8.00	°.11	°.12	1.03	°.55	0.29
6 1	403	dry EG	°.°67	27.00	°.38	°.40	1.03	°.55	0.92
8 1	605	dry EG	0.062	37.51	°.53	°.55	1.03	°.55	1.78
0 1	808	dry GF	0.041	33.13	°.46	°.49	0.85	°.55	2.47
2 1	1010	dry GF	0.033	33.33	°.47	°.49	0.85	°.55	3.15
4 1	1010	dry GF	° ° 3	33.33	0.47	.49	0.85	°.55	3.84
6 1	101°	dry GF	° ° 3	33.33	0.47	°.49	0.85	°.55	4.52
8 1	1°1°	dry GF	° ° 3	33.33	0.47	°.49	0.85	°.55	5.21
0 1	1°1°	dry GF	° ° 3	33.33	0.47	°.49	0.85	°.55	5.89
2 1	1°1°	dry GF	° ° 3	33.33	0.47	°.49	0.85	°.55	6.58
4 1	1°1°	dry GF	0.033	33.33	0.47	°.49	0.85	°.55	7.26
6 1	1°1°	dry GF	0.033	33.33	0.47	°.49	0.85	°.55	7.95
8 1	1°1°	wet GF	° ° 3	33.33	0.47	°.49	0.85	°.55	8.63
0 1	1°1°	wet GF	0.033	33.33	0.47	.49	0.85	°.55	9.32
2 1	1°10	wet GF	0 033	33.33	0.47	0.49	0.85	°.55	1°.00
4 1	1010	wet GF	° 033	33.33	°.47	0.49	0.85	°.55	1°.69
6 1	1010	wet GF	0.033	33.33	°.47	0-49	0.85	° 5	11 37
growth EG (×E 3.77° kcal g), and Gro Fur GF (M				T°tal al/g)	7.61 kg	7.99 kg			11.37 TOTAL COST

show progressive cost of maintenance.

Table 6.4. Weekly feed costs to raise female marten from birth to pelting.

MARTEN Pelter Females	Week	Number of Animals	Av. body Weight g	Feed * g dry feed Type /g body wt.	Daily Consumption g dry feed (body wt x g feed/g body wt)	Total Consump. kg (daily x 14) (x #/1000)	Total Plus 5% wastage factor	Feed Cost /kg	Freight cost $/kg	Cumulative Total cost
April (born)	0	1	28	none	0.000	0,00	0.00	0,00	0.00	0.55 0.00
	1/2	1	101	dry EC	0,040 est.	4.04	0.06	0.06	1.03	0,55 0.09
(begin feed)	3/4	1	173	dry EG	0.094	16.26	0.23	0.24	1,03	0.55 0,47
14a y	5/6	1	270	dry EC	0.074	19.98	0.28	0.29	1.03	0.55 0,93
(weaned)	7/8	1	366	dry EG	0.063	23.06	0.32	0.34	1.03	0,55 1.47
June	9/10	1	463	dry GF	0.050	23.15	0.32	0,34	0,95	0,55 1.94
(adult size)	11/12	1	559	dry GF	0.043	24.04	0.34	0,35	0,85	0,55 2.44
July	13/14	1	559	dry GF	0.043	24.04	0,34	0,35	0,85	0.55 2.93
	15/16	1	559	dry GF	0,043	24.04	0,34	0,35	0,85	0.55 3,42
	17/18	1	559	dry GF	0.043	24,04	0,34	0.35	0,85	0,55 3.92
Aug	19/20	1	559	dry GF	0,043	24,04	0.34	0.35	0,85	0.55 4.41
	21/22	1	559	dry GF	0,043	24.04	0,34	0.35	0.85	0.55 4.91
Sept	23/24	1	559	dry GF	0.043	24.04	0.34	0.35	0.85	0.55 5.40
	25/26	1	559	dry GF	0.043	24.04	0.34	0.35	0,85	0.55 5,90
Ott	27/28	1	559	wet GF	0,043	24.04	0.34	0.35	0,85	0.55 6,39
	29/30	1	559	wet GF	0.043	24.04	0,34	0,35	0,85	0,55 6,88
	31/32	1	559	wet GF	0.043	24.04	0,34	0.35	0,85	0,55 7.38
Nov	33/34	1	559	wet GF	0,043	24.04	0,34	0.35	0.85	0.55 1.87
(pelting)	35/36	1	559	wet GF	0.043	24.04	0.34	0.35	0.85	0.55 8.37
						Total:al/g)	5.59 kg	5,86 kg		8.37 TOTAL COST

* National Mink Early growth EG (HE 3.770 kcal/g), and Gro Fur GF (M

** Cumulative totals to show progressive cost of maintenance,

Table 6.5. Marten Feed Cost per Pelt

Type	Number	Feed Cost /animal *	Feed cost Subtotal	cost of Disease Control /animal **	Disease Control Subtotal	Total
Breeding Male	1	16.51	16.51	5.00	5.00	21.51
Breeding Female	3	16.24	48.73	5.00	15.00	63.73
Male Pelter	4.16	11.37	47.34	5.00	20.81	68.15
Female Pelter	4.16	8.37	34.82	5.00	20.81	55.63
Total food and medicine cost per breeding unit of 1 male: 3 females						209.02
Total production cost of food and medicine per marten pelt:						29.12

Assumptions:

Regular herd composition of 1 male: 3 females
Average litter size of 2.775 (fur farm data from Table 1)
Sex ratio of litter = 1:1

* Data from tables 6.1, 6.2, 6.3, 6.4.
** Based on actual costs at Magrum Fur Farm.

Table 7.1. Weekly feed costs to maintain fisher breeding males for o

FISHER	Week	Breeding Males: Number of Animals	Av. body Height g	Feed * Type	g dry feed /g body wt.
April	1/2	1	4232	dry main	0,033
	3/4	1	4232	dry main	0.033
May	5/6	1	4232	dry main	0.033
	7/8	1	4232	dry main	0,033
June	9/10	1	4232	dry main	0.033
	11/12	1	4232	dry main	0,033
July	13/14	1	4232	dry main	0,033
	15/16	1	4232	dry main	0.033
	17/18	1	4232	dry main	0,033
Aug	19/20	1	4232	dry main	0,033
	21/22	1	4232	dry main	0.033
Sept	23/24	1	4232	dry main	0,033
	25/26	1	4232	dry main	0.033
Ott	27/28	1	4232	dry main	0.033
	29/30	1	4232	dry main	0.033
	31/32	1	4232	dry main	0.033
Nov	33/34	1	4232	dry main	0.033
	35/36	1	4232	dry main	0,033
Dec	37/38	1	4232	wet main	0.033
	39/40	1	4232	wet main	0.033
Jan	41/42	1	4232	wet main	0.033
	43/44	1	4232	wet main	0.033
Feb	45/46	1	4232	wet main	0s033
	47/48	1	4232	wet main	0.033
Mar	49/50	1	4232	wet main	0.033
	51/52	1	4232	wet main	0,033

* National Mink maintenance (ME 3.570 kcal/g).

** Cumulative totals to show progressive cost of maintenance.

Table 7.2. Weekly feed costs to maintain fisher breeding females for one year.

FISHER	Week	Breeding Females: Number of Animals	Breeding Females: Av. body Weight g	Feed * Type	g dry feed /g body wt.	Daily Consumption g dry feed (body wt x g feed/g body wt)	Total Consump. kg (daily x 14) (x # /1000)	Total Plus 5% wastage factor	Feed Cost /kg	Freight cost $/kg	Cumulative Total Cost **
Apri 1	1/2	1	lactating	wet lact	0.097	215.65	3.02	3,17	1,20	0,55	5.54
	3/4	1	lactating	wet lact	0.097	215,65	3.02	3.17	1.20	0.55	11,09
	5/6	1	lactating	wet lact	0.097	215,65	3,02	3,17	1,20	0.55	16,63
	7/8	1	lactating	wet lact	0,097	215,65	3,02	3.17	1.20	0.55	22.17
June (weaned)	9/10	1	2212	dry main	0.042	93,56	1.31	1.38	0,76	0,55	23.97
	11/12	1	2212	dry main	0.042	93,55	1,31	1.38	0.76	0.55	25.76
July	13/14	1	2212	dry main	0.042	93.55	1.31	1.38	0.76	0,55	27,56
	15/16	1	2212	dry main	0,042	93.55	1.31	1.38	0,76	0,55	29.35
	17/18	1	2212	dry main	0.042	93,55	1.31	1.38	0,76	0,55	31,15
Aug	19/20	1	2212	dry main	0.042	93,55	1.31	1.38	0.76	0,55	32,94
	21/22	1	2212	dry main	0.042	93.55	1.31	1.38	0,76	0,55	34.74
Sept	23/24	1	2212	dry main	0,042	93.55	1.31	1.38	0.76	0.55	36.53
	25/26	1	2212	dry main	0.042	93.55	1,31	1.38	0.76	0.55	38,33
Ott	27/29	1	2212	dry main	0.042	93.55	1,31	1.38	0,76	0.55	40,12
	29/30	1	2212	dry main	0,042	93.55	1.31	1.38	0,76	0.55	41.92
	31/32	1	2212	dry main	0,042	93.55	1.31	1,38	0,76	0,55	43.71
Nov	33/34	1	2212	dry main	0,042	93.55	1,31	1.38	0.76	0,55	45.50
(pelting)	35/36	1	2212	dry main	0,042	93.55	1.31	1.38	0,76	0.55	47.30
Dec	37/38	1	2212	wet main	0,042	93.55	1.31	1.38	0.76	0.55	49,09
	39/40	1	2212	wet main	0.042	93.55	1,31	1.38	0,76	0,55	50,89
Jan	41/42	1	2212	wet main	0.042	93.55	1.31	1.38	0,76	0,55	52,68
	43/44	1	2212	wet main	0.042	93,55	1.31	1.38	0.76	0.55	54,48
Feb	45/46	1	pregnant	wet repro	0,056	124.62	1,74	1.83	1,15	0.55	57,58
	47/48	1	pregnant	wet repro	0.056	124.62	1.74	1.93	1.15	0.55	60.68
Mar	49/50	1	pregnant	wet repro	0.056	124.62	1.74	1.83	1.15	0.55	63.78
	51/52	1	pregnant	wet repro	0.056	124,62	1.74	1.83	1,15	0,55	66,89
						Total:	42,63 kg	44.76 kg			66,89 TOTAL COST

* National Mink maintenance (ME 3.570 kcal/g), reproduction (ME 3.550 kcal/g), lactation (ME 3.590 kcal/g).
Gestation requires .200 kcal/g body wt.
Lactation requires an av. of .350 kcal/g body wt. (Nat.Res.Council 1982)

** Cumulative totals to show progressive cost of maintenance.

Table 7.3. Weekly feed costs to raise male fisher from birth to pelting.

FISHER	Pelter Males Week #	Number of Animals	Av. body Height g	Feed * Type	g dry feed /g body wt.**	Daily Consumption g dry feed (body wt x g feed/g body wt)	Total Consump. kg (daily x 14) (x # /1000)	Plus 5% wastage factor	Feed Cost /kg	Freight cost $/kg	Cumulative Total cost ***
April (born)	0	1	40		0.000	0,000	0.00	0.00	1.03	0,55	0.00
	1/2	1	149	dry EG	0.000	0,000	0,00	0.00	1.03	0.55	0,00
(begin feed)	3/4	1	257	dry EG	0.020 est.	5.140	0.07	0.11	1.03	0.55	0.17
Hay	5/6	1	366	dry EG	0,040 est.	14.640	0,20	0.31	1.03	0,55	0.65
weaned	7/8	1	474	dry EG	0.060 est.	28.440	0.40	0,60	1,03	0.55	1,59
June	9/10	1	583	dry EG	0.073	42,559	0,60	0.89	1,03	0,55	3.00
	11/12	1	691	dry EG	0.088	60.808	0,85	1.28	1.03	0,55	5,01
July	13/14	1	800	dry EG	0.084	67.200	0,94	1,41	1.03	0,55	7.24
	15/16	1	1064	dry GE'	0.091	96.824	1,36	2.03	0.85	0,55	10.08
	17/18	1	1328	dry GF	0,084	111.552	1.56	2.34	0.85	0,55	13.36
Aug	19/20	1	1592	dry GF	0.072	114.624	1.60	2.41	0.85	0.55	16.72
	21/22	1	1856	dry GF	0.066	122.496	1.71	2.57	0.85	0,55	20.32
Sept	23/24	1	2120	dry GF	0.066	139,920	1.96	2,94	0,85	0.55	24,43
	25/26	1	2384	dry GF	0.062	147,808	2,07	3.10	0,85	0,55	28.77
Ott	27/28	1	2648	wet GF	0.058	153.584	2.15	3.23	0.85	0,55	33,29
	29/30	1	2912	wet GF	0,049	142,688	2,00	3,00	0,85	0.55	37,47
	31/32	1	3176	wet GF	0.049	155.624	2.18	3,27	0.85	0.55	42.04
Nov	33/34	1	3440	wet GF	0.041	141.040	1,97	2.96	0.85	0,55	46.18
pelting	35/36	1	3704	wet GF	0.039	144.456	2.02	3,03	0.85	0.55	50.42
Dec	37/38	1	3968	wet GF	0.034	134.912	1.89	2.83	0,85	0,55	54.39
ad.size 10 men.	39/40	1	4232	wet GF	0,033	139.656	1,96	2.93	0,85	0.55	58.49
						Total:	27.50 kg	41.24 kg			58,49 TOTAL COST

* National Mink early growth EG (ME 3.770 kcal/g), gro fur GF (ME 3.500 kcal/g)

** Values from Table 4.3.a.

*** Cumulative totals to show progressive cost of maintenance.

Table 7.4. Weekly feed costs to raise female fisher from birth to pelting.

FISHER	Week	Pelter Number of Animals	Females Av. body Weight g	Feed * Type	g dry feed /g body wt.	Consumption g dry feed (body wt x g feed/g body wt)	Consump, kg (daily x 14) (x # /1000)	Plus 5% wastage factor	Feed Cost /kg	Freight cost $/kg	Cumulative Total cost
April	(born) O	1	40		0,000	0.00	0.00	0.00	1.03	0.55	0.00
	1/2	1	149	dry EG	0,000	0,00	0.00	0.00	1.03	0.55	0.00
	(begin feed) 3/4	1	257	dry EG	0.040 est.	10.28	0,14	0.15	1.03	0.55	0.24
May	5/6	1	366	dry EG	0.074	27.08	0.38	0.40	1.03	0,55	0,87
	(weaned) 7/8	1	414	dry EG	0.094	44.56	0.62	0,65	1.03	0,55	1.90
June	9/10	1	583	dry EG	0.093	54.22	0.76	0,80	1.03	0.55	3,15
	11/12	1	691	dry EG	0,092	63.57	0.89	0.93	1.03	0.55	4.62
July	13/14	1	800	dry EG	0.075	60,00	0.84	0.88	1.03	0.55	6.01
	15/16	1	1002	dry GF	0.070	70,14	0,98	1,03	0.85	0.55	7.45
	17/18	1	1203	dry GF	0.070	84.21	1.18	1,24	0,85	0.55	9.19
Aug	19/20	1	1405	dry GE'	0.061	85,71	1,20	1.26	0,85	0.55	10 s 95
	21/22	1	1607	dry GF	0.058	93.21	1,30	1,37	0,85	0,55	12.86
Sept	23/24	1	1808	dry GF	0.050	90.40	1,27	1.33	0.85	0.55	14.72
	25/26	1	2010	dry GF	0.045	90,45	1.27	1.33	0.85	0,55	16.58
Ott	27/28	1	2212	wet GF	0,043	95.12	1.33	1,40	0.85	0,55	18.54
	29/30	1	2212	wet GF	0,043	95,12	1.33	1.40	0,85	0.55	20.49
	31/32	1	2212	wet GF	0.043	95,12	1.33	1,40	0,85	0.55	22.45
Nov	33/34	1	2212	wet GF	0.043	95,12	1.33	1.40	0,85	0.55	24,40
	(pelting) 35/36	1	2212	wet GF	0.043	95,12	1,33	1.40	0,85	0.55	26.36
						Total:	17.49 kg	18.37 kg			26.36 TOTAL COST

* National Mink early growth EG (ME 3.770 kcal/g), /rs gro fur GF (ME 3.500 kcal/g)

** Values from Table 4.3.b.

*** Cumulative totals to show progressive cost of maintenance.

Table 7.5. Fisher Feed Cost per Pelt

Type	Number	Feed Cost /animal *	Feed cost Subtotal	cost of Disease Control /animal**	Disease Control Subtotal	Total
Breeding Male	1	69.17	69.17	5.00	5.00	74.17
Breeding Female	3	66.89	200.66	5.00	15.80	216.46
Male Pelter	4.2	58.49	245.65	5.00	21.00	266.65
Female Pelter	4.2	26.36	110.70	5.00	21.00	131.70
Total production cost per breeding unit of 1 Male: 3 females						688.98
Total production cost per fisher pelt:						81.93

Assumptions:

Regular herd Composition of 1 male: 3 females
Herd composition for artificial insemination 1 male: 10 females
Average litter size of 2.8 [Average of literature values from Table 1.)
Sex ratio of litter =1:1

* Data from Tables 6.1, 6.2, 6.3, 6.4.
** Based on actual costs at Magrum Fur Farm.

Table 8.1. Weekly feed costs to maintain lynx breeding males for one year.

LYNX	Breeding Males Week *	Number of Animals	Av. body Weight g	Feed** Type	g dry feed /g body wt.	Daily Consumption g dry feed (body wt X g feed/g body wt)	Total Consump. kg (daily x 14) (x # /1000)	Plus 5% wastage factor	Feed Cost /kg	Freight Cost $/kg	Cumulative Total Cost ***
April	1/2	1	10167	dry main,	0,033	333.20	4.66	4.90	0.76	0.55	6.39
	3/4	1	10167	dry main,	0,033	333.20	4.66	4.90	0.76	0.55	12.78
May	5/6	1	10167	dry main,	0.033	333.20	4.66	4.90	0,76	0.55	19,18
	7/8	1	10167	dry main,	0.033	333.20	4.66	4.90	0.76	0.55	25.57
June	9/10	1	10167	dry main,	0.033	333.20	4,66	4.90	0,76	0.55	31,96
	11/12	1	10167	dry main.	0.033	333.20	4.66	4.90	0,76	0.55	38.35
July	13/14	1	10167	dry main.	0.033	333.20	4.66	4,90	0.76	0.55	44.74
	15/16	1	10167	dry main,	0.033	333,20	4.66	4.90	0,76	0,55	51.14
	17/18	1	10167	dry main.	0,033	333.20	4.66	4.90	0.76	0,55	57.53
Aug	19/20	1	10167	dry main,	0,033	333.20	4.66	4.90	0.76	0.55	63,92
	21/22	1	10167	dry main.	0.033	333,20	4.66	4.90	0.76	0.55	70,31
Sept	23/24	1	10167	dry main.	0.033	333,20	4.66	4,90	0.76	0.55	76.70
	25/26	1	10167	dry main.	0,033	333,20	4,66	4.90	0,76	0.55	83.10
Ott	27/28	1	10167	dry main,	0.033	333.20	4,66	4.90	0.76	0.55	89.49
	29/30	1	10167	dry main,	0,033	333,20	4.66	4,90	0,76	0.55	95.88
	31/32	1	10167	dry main,	0,033	333.20	4.66	4.90	0.76	0,55	102.27
Nov	33/34	1	10167	dry main.	0.033	333,20	4,66	4.90	0.76	0.55	108.66
	35/36	1	10167	dry main,	0.033	333.20	4.66	4.90	0.76	0,55	115.06
Dec	37/38	1	10167	wet main,	0,033	333,20	4.66	4,90	0.76	0.55	121.45
	39/40	1	10167	wet main,	0.033	333.20	4.66	4.90	0.76	0,55	127.84
Jan	41/42	1	10167	wet main,	0.033	333.20	4.66	4,90	0.76	0,55	134,23
	43/44	1	10167	wet main.	0,033	333.20	4.66	4.90	0,76	0,55	140.62
Feb	45/46	1	10167	wet main,	0.033	333.20	4,66	4.90	0.76	0.55	147.02
	47/48	1	10167	wet main.	0,033	333.20	4.66	4.90	0,76	0,55	153.41
Mar	49/50	1	10167	wet main,	0,033	333.20	4.66	4.90	0,76	0.55	159.80
	51/52	1	10167	wet main,	0.033	333.20	4.66	4.90	0.75	0.55	166.19
							Total: 121.29 kg	127,35 kg			166.19 TOTAL COST

* Weeks refer to weeks of the fox annual cycle rather than that of the lynx.

** National Mink maintenance (ME 3.570 kcal/g)

*** Cumulative totals to show progressive cost of maintenance,

Table 8.2. **Weekly** feed costs **to maintain** lynx breeding females for one **year.**

LYNX	Week *	Breeding Females: limber of Animals	Av. body Weight g	Feed** Type	g dry feed /g body wt.	Daily Consumption gdry feed (body wt x g feed/g body wt)	Total Consump. kg (daily x 14) (x # /1000)	Plus 5% wastage factor	Feed Cost /kg	Freight Cost $/kg	Cumulative Total Cost ***
April	1/2	1	Pregnant	wet repro	0.056	473.24	6s63	6.96	1.15	0.55	11.78
	3/4	1	Pregnant	wet repro	0,056	473.24	6.63	6.96	1.15	0.55	23.56
nay	5/6	1	Pregnant	wet repro	0.056	473.24	6.63	6.96	1.15	0.55	35.34
	7/8	1	Pregnant	wet repro	0.056	473.24	6.63	6.96	1.15	0.55	47.12
June	9/10	1	lactating	wet lact.	0.097	818.94	11.47	12.04	0.62	0.55	61.18
	11/12	1	lactating	dry I act.	0.097	818.94	11.47	12.04	1.20	0,55	82.23
July	13/14	1	lactating	dry lact.	0.097	818.94	11.47	12.04	1.20	0.55	103.28
	15/16	1	lactating	dry lact.	0.097	818.94	11.47	12.04	1.20	0.55	124.34
	17/18	1	lactating	dry lact.	0.097	818.94	11.47	12.04	1.20	0.55	145.39
Aug	19/20	1	lactating	dry lact.	0.097	818.94	11.47	12.04	1.20	0.55	166.44
	21/22	1	8400	dry main.	0.042	355.29	4.97	5.22	0.76	0.55	173.25
Sept	23/24	1	8400	dry main.	0.042	355.29	4.97	5.22	0.76	0.55	180.07
	25/26	1	a400	dry main.	0.042	355.29	4.97	5.22	0.76	0.55	186. 89
Ott	27/28	1	8400	dry main.	0.042	3S5.29	4.97	5.22	0.76	0.55	193.70
	29/30	1	8400	dry main.	0.042	355.29	4.97	5.22	0.76	0.55	200.52
	31/32	1	a400	dry main,	0.042	355.29	4.97	5,22	0.76	0.55	207.33
Nov	33/34	1	a400	dry main.	0.042	355.29	4.97	5.22	0.76	0055	214.15
	35/36	1	a400	dry main.	0.042	355.29	4.97	5.22	0.76	0.55	220.97
Dec	37/38	1	a400	dry main.	0.042	355.29	4.97	5.22	0.76	0.55	227.78
	39/40	1	a400	wet main.	0.042	355.29	4.97	5.22	0,76	0.55	234.60
Jan	41/42	1	8400	wet main.	0.042	355.29	4.97	5.22	0.76	0.55	241.41
	43/44	1	8400	wet main.	0.042	355.29	4.97	5.22	0.76	0.55	248,23
Feb	45/46	1	8400	wet main.	0.042	355.29	4.97	5.22	0.76	0.55	255.04
	47/48	1	a400	wet main.	0,042	355.29	4.97	5.22	0.76	0.55	261.86
Mar	49/50	1	8400	wet main,	0.042	355.29	4*97	5.22	0.76	0.55	268.68
	51/52	1	Pregnant	wet repro	0.056	473.24	6.63	6.96	1.15	0.55	280.46
							Total: 176.53 kg	185.36 kg			280.46 TOTAL COST

*** Weeks** refer to **weeks** of the fox annual cycle rather than that of the lynx.

**** National Mink maintenance (ME 3.570 kcal/g),**
reproduction **(ME** 3.550 **kcal/g),** lactation **ME** 3.590 **kcal/g)**

******* Cumulative totals to show progressive cost of maintenance.

Table 8.3. Weekly feed costs to raise male lynx from birth to pelting.

LYNX	Week *	Pelter Number of Animals	Males Av. body Weight g	Feed Type	** g dry feed /g body wt.	Daily Consumption g dry feed (body wt x g feed/g body wt)(x	Total Consump. kg (daily x14) #/1000)	Plus 5% wastage factor	Peed cost /kg	Freight cost $/kg	Cumulative Total cost ***
April	1/2	1			0.000	0.00	0.00	0.00	0.85	0.55	0.00
	3/4	1			0.000	0.00	0.00	0.00	0.85	0.55	0.00
May	5/6	1			0.000	0.00	0.00	0.00	0.85	0.55	0.00
(born)	7/8	1	202		0.000	0.00	0.00	0.00	0.85	0.55	0.00
June	9/10	1	498		0.000	0.00	0.00	0.00	0.85	0.55	0.00
	11/12	1	795		0.000	0.00	0.00	0.00	0.85	0.55	0.00
July	13/14	1	1092		0.000	0.00	0.00	0.00	0.85	0.55	0.00
	15/16	1	1388	dry EG	0.030 est.	41.64	0.58	0.61	1.03	0.55	0.96
	17/18	1	1685	dry EG	0.050 est.	84.25	1.18	1.24	1.03	0.55	2.91
Aug	19/20	1	1981	dry EG	0.070 est.	138.67	1.94	2.04	1.03	0.55	6.12
(weaned)	21/22	1	2278	dry EG	0.079 est.	179.96	2.52	2.65	1.03	0.55	10.29
Sept	23/24	1	2574	dry EG	0.073	187.90	2.63	2.76	1.03	0.55	14.64
	25/26	1	2871	dry EG	0.013	209.58	2.93	3.08	1.03	0.55	19.49
Ott	27/28	1	3167	dry EG	0.073	231.19	3.24	3.40	1.03	0.55	24.85
	29/30	1	3464	dry EG	0.088	304.83	4.27	4.48	1.03	0.55	31.90
	31/32	1	3761	dry EG	0.088	330.97	4.63	4.87	1.03	O*55	39.57
Nov	33/34	1	4057	wet GF	0.084	340.79	4.77	5.01	0.85	0.55	46.57
	35/36	1	4354	wet GF	0.084	365.74	5.12	5.38	0.85	0.55	54.09
Dec	37/38	1	4632	wet GF	0.078	361.30	5.06	5.31	0.85	0.55	61.52
	39/40	1	4895	wet GF	0.084	411.18	5.76	6.04	0.85	0.55	69.97
Jan	41/42	1	5159	wet GF	0.084	433.36	6,07	6.37	0,85	0.55	78.88
	43/44	1	5423	wet GF	0.072	390.46	5.47	5.74	0.85	0.55	86.91
Feb	45/46	1	5686	wet GF	0.072	409.39	5.73	6.02	0.85	0.55	95.32
	47/48	1	5950	wet GF	0.066	392.70	5.50	5.77	0.85	0.55	103.39
Mar	49/50	1	6213	wet GF	0.066	410.06	5.74	6.03	0.85	0.55	111.82
	51/52	1	6477	wet GF	0.062	401.57	5.62	5.90	0.85	0.55	120.08
							Total: 78.76 kg	2.708 kg			120.08 TOTAL COST

* Weeks refer to weeks of the fox annual cycle rather than that of tbe lynx.

** National Mink early growth EG (ME 3.77 kcal/g), gro fur GF (ME 3.50 kcal/g)

*** Cumulative totals to show progressive cost of maintenance.

Note: Hale lynx attain maximum size in their second year (Table 3.5.) .

Table 8.4. Weekly feed costs to raise female lynx from birth to pelting.

LYNX	Week *	Pelter Females Number of Animals	Av. body Weight g	Feed ** Type	g dry feed /g body wt.	Daily Consumption gdry feed (body wt x g feed/g body wt)	Total Consump. kg (daily x 14) (x # /1000)	Plus 5% wastage factor	Feed Cost /kg	Freight cost $/kg	Cumulative Total Cost ***
April	1/2	1			0.000	0.00	0.00	0,00	0.85	0.55	0.00
	3/4	1			0.000	0.00	0.00	0.00	0.85	0.55	0.00
May	5/6	1			0.000	0.00	0.00	0.00	0.85	0.55	0.00
(born)	7/8	1	202		0.000	0.00	0.00	0.00	0.85	0.55	0.00
June	9/10	1	498		0.000	0.00	0.00	0,00	0.85	0.55	0.00
	11/12	1	795		0.000	0.00	0.00	0.00	0.85	0.55	0.00
July	13/14	1	1091		0.000	0.00	0.00	0.00	0.85	0.55	0.00
	15/16	1	1388	dry EG	0.030 est.	41.64	0.58	0.61	1.03	0.55	0.96
	17/18	1	1684	dry KG	0.050 est.	84.20	1.18	1.24	1.03	0.55	2.91
Aug	19/20	1	1980	dry EG	0.070 est.	138.60	1.94	2.04	1.03	0.55	6.12
	21/22	1	2277	dry EG	0.074	168.50	2.36	2.48	1.03	0.55	10.02
Sept	23/24	1	2573	dry EG	0.074	190.40	2.67	2.80	1.03	0.55	14.43
	25/26	1	2870	dry EG	0.094	269,78	3.78	3.97	1.03	0.55	20.68
Ott	27/28	1	3166	dry EG	0.094	297.60	4.17	4.37	1.03	0.55	27.57
	29/30	1	3463	dry EG	0.093	322.06	4.51	4.73	1.03	0.55	35.02
	31/32	1	3759	dry EG	0.093	349.59	4.89	5.14	1.03	0.55	43.12
Nov	33/34	1	4055	wet GP	0.099	401.45	5.62	5.90	0.85	0.55	51.37
	35/36	1	4352	wet GP	0.099	430.85	6.03	6.33	0.85	0.55	60.23
Dec	37/38	1	4591	wet GP	0.080	367.28	5.14	5,40	0.85	0.55	67.78
	39/40	1	4772	wet GP	0.080	381.76	5.34	5.61	0.85	0.55	75.62
Jan	41/42	1	4953	wet GP	0.070	346.71	4.85	5.10	0.85	0.55	82.75
	43/44	1	5135	wet GP	0.070	359.45	5.03	5.28	0.85	0.55	90.14
Feb	45/46	1	5316	wet GP	0.063	334.91	4.69	4.92	0.85	0.55	97.03
	47/48	1	5498	wet GP	0.061	335.38	4.70	4.93	0.85	0.55	103.92
Mar	49/50	1	5679	wet GP	0.061	346.42	4.85	5.09	0.85	0.55	111.04
	51/52	1	5860	wet GP	0.058	339.88	4.76	5.00	0.85	0.55	118.03
							Total: 77.09 kg	80.94 kg			118.03 TOTAL COST

* Weeks refer to weeks of the fox annual cycle rather than that of the lynx.
** National Mink early growth EG (ME 3.77 kcal/g), gro fur GP (ME 3.50 kcal/g)
*** Cumulative totals to show progressive cost of maintenance.

From lynx age of 29 weeks (which is week 37 of fox cycle or December) the rate of growth for females is calculated using the percent increase for male lynx; this results in an estimate of females reaching adult size at approximately 59 weeks of age or mid July of the following year.

Table 8.5. Lynx Feed Cost per Pelt

Type	Number	Feed Cost /animal *	Feed Cost Subtotal	Cost of Disease Control /animal **	Disease Control Subtotal	Total
Breeding Male	1	166.19	166.19	5.00	5.00	171.19
Breeding Female	3	280,46	841.37	5.00	15.00	856.37
Male Pelter	4.50	120.08	540.36	5.00	22.50	545.77
Female Pelter	4.50	118.03	531.13	5.00	22.50	548.37
Total food and medicine cost per breeding unit of 1 male: 3 females						2,144.05
Total food and medicine cost per lynx pelt:						238.23

Assumptions:

Regular herd composition of 1 male: 3 females
Herd composition for artificial insemination 1 male: 10 females
Average litter size of 3 (Average of literature values from Table 1.)
Sex ratio of litter = 1:1

* Data from tables 8.1, 8.2, 8.3, 8.4.
** Based on actual costs at Magrum Fur Farm.

F. ECONOMICS OF RANCH FUR PRODUCTION

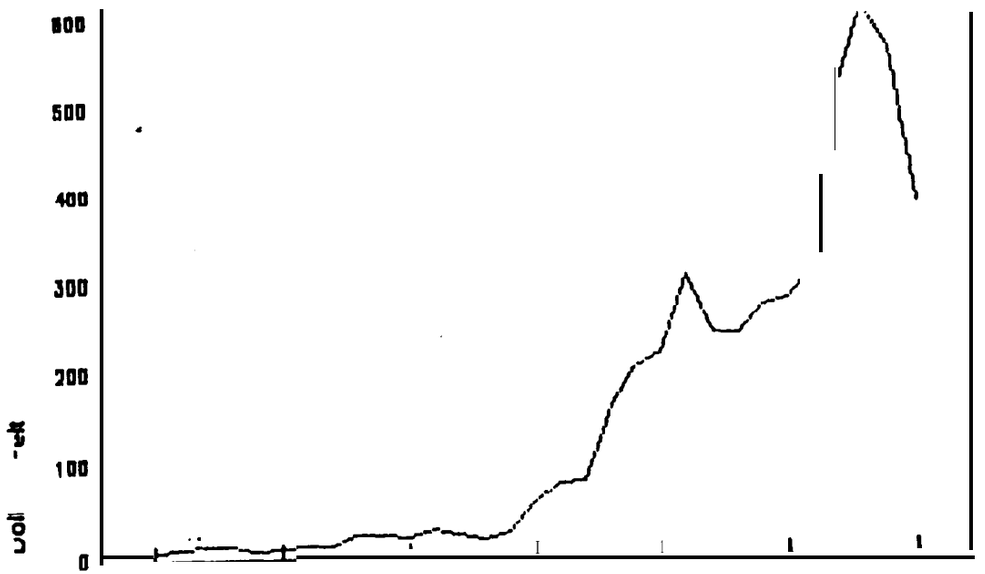
The calculations and estimates in the preceding tables show the cost of feed and medicines for maintaining a breeding herd and producing pelts of fox, marten, fisher and lynx. The analysis that follows here shows how these costs compare to recent prices in the raw fur market.

Figure 10 plots the price cycle for NWT wild fur from 1958 to the present against the ranched fox prices. Long term trends for marten, fisher and lynx show a market pattern that may provide a pelt that is complimentary to ranch fox. That is, will fisher, marten or lynx prices be up or at least steady when fox prices are down? The trends from 1978 to 1988 show a trend in marten, fisher and lynx opposite to fox. Prior to 1978 all are low but show positive trend.

Table 10 provides a year by year comparison of current pelt production costs to pelt prices. This is an artificial comparison since feed and labour costs in 1970 and 1980 were not what they are now. The comparison is still useful in that it shows how profits respond to production costs. Table 11 shows the frequency of profitable/ unprofitable years when 1990 costs are applied retroactively.

Adjusting production costs should provide a more realistic result for assessing the long term profit/loss trend for each species in a ranch setting. Tables 12 and 13 show 1990 costs adjusted by -5% progressively back to 1958. This should show a more realistic profit/loss frequency for these species.

Figure 10.



	78/88 Trend	10 Year Trend
Wild Lynx NWT	up	up
Wild Mink NWT	steady	steady
Wild Fisher NWT	up	up
Wild Marten NWT	up	up
Wild Otter NWT	down	down

G. **LABOUR AND MANAGEMENT** COSTS

Feed for the herd is perhaps the single most important cost item that determines the profit/loss **of** the fur farm operations. Feeding costs cannot be deferred and require cash. It is however, only one of many costs that must be considered. The **Magrum** operation now has five years experience in the full annual cycle of an operating a fur farm. The full range of operating costs (other than feed) fall into several categories.

1. **Labour/Management**

Extra help at pelting time plus care and feeding for periods when the owner is away from the farm has incurred costs of $3,500.00 per year. This is additional to the service and effort of the owner/manager which is calculated at 42,000.00 per **anum.** Whi 1 e revenues to date have not provided this annual income to Mr. **Magrum,** costing a prolonged pilot project must include a fair and reasonable sum for **labour** and management.

Total labour/management	45,500.00 /year

2. Energy

Energy for the operation takes numerous forms:

Electrical	600.00 /year
Propane	300.00 /year
Gasoline	2,300.00 /year
Wood	800.00 /year

3. Repairs and Maintenance

The actual cost of maintenance and repairs to equipment and buildings was 1,700.00 in 1988. A rule of thumb has replacement of cages after ten years of service. At current prices of materials the cages cost:

Breeders	- male	125.00 /cage
	- female/litter	185.00 /cage
Pelters	- 2 pelters/cage in a 100 cage shed	140.00 /cage

for materials only. The cost of labour is covered in the section on labour/management costs. At these costs and a ten year write off rate the annual cage cost is:

Breeders	- male	12.50 /cage or 12.50 /male
	- female/litter	18.50 /cage or 18.50 /litter
Pelters	- 2 pelters/cage	14.00 /cage or 7.00 /pelt.

4. Insurance

Insurance for buildings in remote locations is very expensive but remains a necessity. Insurance on vehicles is mandatory.

Buildings	2,500.00 /year
Vehicles	600.00 /year

This does not include insurance for the fox herd.

services. In the **Magrum** experience it has been approximately 1,000.00 per year.

6. Lease Costs and Taxes

Land lease fees and taxes have been increasing year by year and are currently 1,200.00 per year.

The **Magrums** are confident that their costs per pelt are as low as possible under the circumstances. Also, their ranking among fur producers as shown by average pelt prices indicates their pelts are of a consistently high quality.'

The present herd is as large as can be handled without hiring permanent help either part time or full time. Their location makes it very difficult to attract help. When it is available, they must pay a premium to **accommodate** the cost of travel twenty miles each way from Hay River.

Consolidating labour/management and related costs and prorating these over 350 pelts per year (approximate annual pelt production from a 100 female herd) provides a reliable figure for the fixed costs (other than feed and medicine) of producing a fox pelt.

Labour/management			45,500.00	/year
Energy			4,000.00	/year
Insurance			3,100.00	/year
Legal and Accounting Services			1,000.00	/year
Lease costs and taxes			1,200.00	/year
Equipment Maintenance, Repairs, Hardware			4,000.00	/year
Cages: **Mal**es	35*	@ 12.50	437,50	
Female/litter	100.	@ 18.50	1,850.00	
Pelters	350.	@ 7.00	2,450.00	
		Subtotal:	63,537.50	
Cost per fox pelt	63,537,50 / 350. =		181.54	

These costs are also considered to be useful in estimating the fixed costs of diversification. While more sophisticated and newer designs

might be considered for holding marten, fisher or lynx, there is a tremendous economy of monies and effort to modify existing facilities rather than capitalizing new ones. Modifications should include heavier gauge vinyl coated mesh for fisher and lynx cages and slightly modified pelter sheds for holding lynx should that be considered. Holding marten may require substituting existing mesh with smaller squares to reduce problems associated with smaller feet of kits going through the screen causing fractures and dislocations.

H. OVERALL PRODUCTION COSTS

It is necessary to make certain assumptions to estimate costs of producing marten, lynx and fisher.

1. That the feed and medical costs are approximately as described above;

2. That a one man operation can handle a breeding herd of 100 females;

3. That the labour/management costs experienced by Magrum would cover the costs of rearing and producing marten, fisher and lynx;

4. That the hardware costs of fox cages are comparable to those needed for marten, fisher and lynx.

Applying these assumptions and related costs provides an estimated cost of production for pelts from each species.

Table 9. Estimated Cost of Pelt Production by Species (1990 costs, no GST)

Species	Food/Medicine	Labour/Management/Hardware	Total Cost/Pelt
Fox	66.28	181.54	247.82
Marten	25.12	181.54	206.66
Fisher	81,93	181,54	263.47
Lynx	238.23	181.54	419.77

Table 9 shows that a herd of marten requires considerably less cash to maintain than the same number of lynx.

Table 10. Comparison of current production costs to pelt prices. *

Year	Average Values Fox	Marten	Fisher	Lynx	1990 Cost of Production/Pelt Fox	Marten	Fisher	Lynx	Difference between 1990 cost of production and realized price/pelt Fox	Marten	Fisher	Lynx
1957 / 1958		6.71	19.05	6.89	247.82	2[illegible]6	263.47	419.77		(199.95)	(244.42)	(412.88)
1958 / 1959	10.78	6.51	17.20	9.01	247.82	2[illegible]6	263.47	419.77	(237.04)	(200.15)	(246.27)	(410.76)
1959 / 1960	12.42	7.50	15.50	13.00	247.82	2[illegible]6	263.47	419.77	(235.40)	(199.16)	(247.97)	(406.77)
1960 / 1961	10.00	7.50	15.50	13.00	247.82	2[illegible]6	263.47	419.77	(237.82)	(199.16)	(247.97)	(406.77)
1961 / 1962	10.00	6.24	13.12	7.23	247.82	2[illegible]6	263.47	419.77	(237.82)	(200.42)	(250.35)	(412.54)
1962 / 1963	10.00	8.25	10.36	8.81	247.82	2[illegible]6	263.47	419.77	(237.82)	(198.41)	(253.11)	(410.96)
1963 / 1964	15.09	10.97	10.43	11.98	247.82	2[illegible]6	263.47	419.77	(232.73)	(195.69)	(253.04)	(407.79)
1964 / 1965	43.37	9.90	5.83	11.38	247.82	2[illegible]6	263.47	419.77	(204.45)	(196.76)	(257.64)	(408.39)
1965 / 1966	53.21	12.66	9.44	24.80	247.82	2[illegible]6	263.47	419.77	(194.61)	(194.00)	(254.03)	(394.97)
1966 / 1967	37.35	12.42	10.08	23.88	247.82	2[illegible]6	263.47	419.77	(210.47)	(194.24)	(253.39)	(395.89)
1967 / 1968	34.28	9.88	10.91	19.94	247.82	2[illegible]6	263.47	419.77	(213.54)	(196.78)	(252.56)	(399.83)
1968 / 1969	36.34	9.15	15.70	28.10	247.82	2[illegible]6	263.47	419.77	(211.48)	(197.51)	(247.77)	(391.67)
1969 / 1970	29.64	10.27	12.61	22.50	247.82	2[illegible]6	263.47	419.77	(218.18)	(196.39)	(250.86)	(397.27)
1970 / 1971	31.19	9.85	14.83	16.95	247.82	2[illegible]6	263.47	419.77	(216.63)	(196.81)	(248.64)	(402.82)
1971 / 1972	39.11	10.40	11.77	26.80	247.82	2[illegible]6	263.47	419.77	(208.71)	(196.26)	(251.70)	(392.97)
1972 / 1973	66.60	17.82	23.32	57.93	247.82	2[illegible]6	263.47	419.77	(181.22)	(188.84)	(240.15)	(361.84)
1973 / 1974	98.39	19.96	37.09	78.43	247.82	2[illegible]6	263.47	419.77	(149.43)	(186.70)	(226.38)	(341.34)
1974 / 1975	104.87	16.69	29.39	80.42	247.82	2[illegible]6	263.47	419.77	(142.95)	(189.97)	(234.08)	(339.35)
1975 / 1976	181.75	16.83	40.13	163.07	247.82	2[illegible]6	263.47	419.77	(66.07)	(189.83)	(223.34)	(256.70)
1976 / 1977	206.67	24.40	52.57	206.39	247.82	2[illegible]6	263.47	419.77	(41.15)	(182.26)	(210.90)	(213.38)
1977 / 1978	226.50	25.42	59.39	223.01	247.82	2[illegible]6	263.47	419.77	(21.32)	(181.24)	(204.08)	(196.76)
1978 / 1979	364.42	36.74	123.60	305.88	247.82	2[illegible]6	263.47	419.77	116.60	(169.92)	(139.87)	(113.89)
1979 / 1980	275.24	39.72	113.07	244.48	247.82	2[illegible]6	263.47	419.77	27.42	(166.94)	(150.40)	(175.29)
1980 / 1981	294.84	35.01	64.98	244.60	247.82	2[illegible]6	263.47	419.77	47.02	(171.65)	(198.49)	(175.17)
1981 / 1982	278.79	40.46	93.45	272.96	247.82	2[illegible]6	263.47	419.77	30.97	(166.20)	(170.02)	(146.81)
1982 / 1983	133.65	43.98	169.07	281.92	247.82	2[illegible]6	263.47	419.77	(114.17)	(162.68)	(94.40)	(137.85)
1983 / 1984	178.68	53.24	102.69	316.07	247.82	2[illegible]6	263.47	419.77	(69.14)	(153.42)	(160.78)	(103.70)
1984 / 1985	158.42	56.72	129.44	524.65	247.82	2[illegible]6	263.47	419.77	(89.40)	(149.94)	(134.03)	104.88
1985 / 1986	126.70	59.10	112.13	615.64	247.82	2[illegible]6	263.47	419.77	(121.12)	(147.56)	(151.34)	195.87
1986 / 1987	180.33	109.95	188.69	566.07	247.82	2[illegible]6	263.47	419.77	(67.49)	(96.71)	(74.78)	146.30
1987 / 1988	113.94	106.83	132.84	389.83	247.82	2[illegible]6	263.47	419.77	(133.88)	(99.83)	(130.63)	(29.94)

* Average values taken from Statistics Canada Fur Production Seasons 1957/58 - 1987/88. Cost taken from Table 9.
( ) = loss/pelt _____ = profit/pelt

Table 11. Profit/Loss Comparison of *Fox,* Lynx, Marten and Fisher in a ranch *setting.**

Year	Fox	Marten	Fisher	Lynx	Profitable species/year
1957 / 1958	**no**	no	no	no	0/4
1958 / 1959	no	no	no	no	0/4
1959 / 1960	no	no	no	no	0/4
1960 / 1961	no	no	no	no	0/4
1961 / 1962	no	no	no	no	0/4
1962 / 1963	no	no	no	no	0/4
1963 / 1964	no	no	no	no	0/4
1964 / 1965	no	no	no	no	0/4
1965 / 1966	no	no	no	no	0/4
1966 / 1967	no	no	no	no	0/4
1967 / 1968	no	no	no	no	0/4
1968 / 1969	no	no	no	no	0/4
1969 / 1970	no	no	no	no	0/4
1970 / 1971	no	no	no	no	0/4
1971 / 1972	no	no	no	no	0/4
1972 / 1973	no	no	no	no	0/4
1973 / 1974	no	no	no	no	0/4
1974 / 1975	no	no	no	no	0/4
1975 / 1976	no	no	no	no	0/4
1976 / 1977	no	no	no	no	0/4
1977 / 1978	no	no	no	no	0/4
1978 / 1979	yes	no	no	no	1/4
1979 / 1980	yes	no	no	no	1/4
1980 / 1981	yes	no	**no**	no	1/4
1981 / 1982	yes	no	no	no	1/4
1982 / 1983	no	no	no	no	0/4
1983 / 1984	no	no	no	no	0/4
1984 / 1985	no	no	no	yes	1/4
1985 / 1986	no	no	no	yes	1/4
1986 / 1987	no	no	no	yes	1/4
1987 / 1988	no	no	no	no	**0/4**
Profitable Years:	4/31	0/31	0/31	3/31	

* Assuming current costs of production (Table 9.)

Table 12. Comparison of production costs (Table 9.) to pelt prices

	Average Values				Adjusted Cos	
	Fox	Marten	Fisher	Lynx	Fox	Marte
Year						
1957 / 1958		6.71	19.05	6.89	48.00	40.0
1958 / 1959	10.78	6.51	17.20	9.01	50.53	42.1
1959 / 1960	12.42	7,50	15,50	13,00	53.19	44.3
1960 / 1961	10.00	7.50	15.50	13.00	55.99	46,6
1961 / 1962	10.00	6.24	13.12	7.23	58.94	49.1
1962 / 1963	10.00	8.25	10.36	8.81	62.04	51.7
1963 / 1964	15.09	10.97	10,43	11.98	65.30	54.4
1964 / 1965	43,37	9.90	5.83	11.38	68.74	57.3
1965 / 1966	53.21	**12.66**	9.44	24,80	72.36	60.3
1966 / 1967	37.35	**12.42**	10.08	23.88	76.17	63.5
1967 / 1968	34,28	9.88	10.91	19.94	80.18	66.8
1968 / 1969	36.34	9.15	**15.70**	28.10	84.40	70.3
1969 / 1970	29.64	10.27	12.61	22,50	88.84	74.0
1970 / 1971	31.19	9.85	14.83	16,95	93.51	77.9
1971 / 1972	39.11	10,40	11.77	26.80	98.44	82.0
1972 / 1973	66.60	17.82	23.32	57.93	103.62	86.4
1973 / 1974	98.39	19,96	37,09	**78.43**	109.07	90.9
1974 / 1975	104.87	16.69	29,39	80.42	114.81	95.7
1975 / 1976	181.75	16.83	40.13	163.07	**120.85**	100.7
1976 / 1977	206.67	24.40	52.57	206.39	127.21	106.0
1977 / 1978	226.50	25.42	59.39	223.01	133.91	111.6
1978 / 1979	364.42	36.74	123.60	305.88	140.96	117.5
1979 / 1980	275,24	39.72	113.07	244,48	148.38	123.7
1980 / 1981	294.84	35.01	64.98	244.60	156.19	130.2
1981 / 1982	278.79	40.46	93.45	272.96	164.41	137.1
1982 / 1983	133.65	43.98	169.07	281.92	173.06	**144.3**
1983 / 1984	178.68	53.24	102s69	316.07	182.17	151.9
1984 / 1985	158.42	56.72	129.44	524.65	191.76	159.9
1985 / 1986	126.70	59.10	112.13	615.64	201.85	168.3
1986 / 1987	180.33	109.95	188.69	**566.07**	212.47	177.1
1987 / 1988	113.94	106.83	132,84	389.83	223.65	186,5
89/90 production costs:					247.82	206.6

* Average values taken from Statistics Canada Fur Production Season
( ) = loss/pelt, ____ = profit/pelt estimted

Table 13. Profit/Loss Comparison of Fox, Lynx, Marten and Fisher in a ranch setting.*
(1990 production costs adjusted by -5% /year)

Year	Fox	Marten	Fisher	Lynx	Profitable species/year
1957 / 1958	no	no	no	no	0/4
1958 / 1959	no	no	no	no	0/4
1959 / 1960	no	no	no	no	0/4
1960 / 1961	no	no	no	no	0/4
1961 / 1962	no	no	no	no	0/4
1962 / 1963	no	no	no	no	0/4
1963 / 1964	no	no	no	no	0/4
1964 / 1965	no	no	no	no	0/4
1965 / 1966	no	no	no	no	0/4
1966 / 1967	no	no	no	no	0/4
1967 / 1968	no	no	no	no	0/4
1968 / 1969	no	no	no	no	0/4
1969 / 1970	no	no	no	no	0/4
1970 / 1971	no	no	no	no	0/4
1971 / 1972	no	no	no	no	0/4
1972 / 1973	no	no	no	no	0/4
1973 / 1974	no	no	no	no	0/4
1974 / 1975	no	no	no	no	0/4
1975 / 1976	yes	no	no	no	1/4
1976 / 1977	yes	no	no	no	1/4
1977 / 1978	yes	no	no	no	1/4
1978 / 1979	yes	no	no	yes	2/4
1979 / 1980	yes	no	no	no	1/4
1980 / 1981	yes	no	no	no	1/4
1981 / 1982	yes	no	no	no	1/4
1982 / 1983	no	no	no	no	0/4
1983 / 1984	no	no	no	yes	1/4
1984 / 1985	no	no	no	yes	1/4
1985 / 1986	no	no	no	yes	1/4
1986 / 1987	no	no	no	yes	1/4
1987 / 1988	no	no	no	yes	1/4
profitable Years:	7/31	0/31	0/31	6/31	

I. EFFECT OF TEE GOODS AND SERVICES TAX

It must be noted that 1991 costs for feed, energy, hired help, etc. will be up by a minimum of 7% due to the new Goods and Services Tax. The inflationary effect of this tax on the economy especially northern transportation will result in an estimated real cost increase of 10%. Projected feed and medicine costs are shown in Table 14.

Table 14. Projected Profit/Loss of Raising Marten, Fisher, and Lynx including the effects of GST.

	Cost/ Pelt	Add 10% for GST	1990 Pelt Prices Large	Medium	Small	Profit (Loss)
Marten	206.66	227.32	84.66	62.00		(142.66) - (165.32)
Fisher	263.47	289.81		64.00	180.00	(225.81) - (109.81)
Lynx	419.77	461.74		236.83		(224.91)
* Fox				40.25		

* Ranched silver fox at April, 1990 sale brought $35.00 US or $40.25 Cdn.

1990 pelt prices are shown opposite the cost figures to show the operating margins (losses) when GST is included.

J. AR EXPANDED PILOT PROJECT

The Magrum operation has shown that high quality fox pelts can be produced successfully at Hay River. Costs are higher but comparable under the circumstances to other fur farm operations of similar size. Unfortunately the raw fur market is such that a single species operation is not profitable every year. Continuing on with silver fox with 100 + litters per year will result in significant losses for the next few years. This may be the ideal time to reduce the fox herd and spend Mr. Magrum's skills and effort in developing a capability to produce new species.

Only species natural to the region are considered. Exotic species will be cause for concern for wildlife managers due to escapes. Also, exotic breeding stock must be purchased while native species can be live trapped.

Since this pilot project is intended to demonstrate new economic opportunities which have no guarantees, it will require ongoing government support and commitment. The simplest way to achieve this is perhaps for the government to enter into a management contract with Mr. Magrum for his services in establishing an experimental herd of native furbearers. In order to do this as economically as possible it should be done in existing facilities which would be leased to government for the demonstration period, (three to five years). At the end of the experimental period government would have complete access to all information and data produced as well as an option on breeding stock. All assets, facilities and breeding and pelting stock would revert to Mr. Magrum. Revenues from the sale of pelts and breeding stock (other than fox) during the demonstration period would be applied against the cost of operations. Shortfalls would be made up by supplementary funding from government.

A five year project is costed. It is based on assumptions enumerated below.

Fox
- The breeding herd is reduced to 30 breeding females.
- One pelter shed is used for rearing fox pups for pelting.
- 100 pelts per year will be produced.

Lynx
- A breeding herd of 15 - 20 females and 6 -10 males is assembled by live trapping around Great Slave Lake or purchased from existing breeders.
- One shed is dedicated to lynx handling.
- Costs of modifying the shed will not exceed 10,000 for materials.
- There will not be any significant revenues from lynx in the experimental period.

Marten
- A breeding herd of 15 - 20 females and 6 -10 males is assembled by live trapping around Great Slave Lake.
- Existing adult fox cages are used plus 1/2 a pelter shed. Both are modified for marten production.
- There will be no significant revenue from marten during the experimental period.

Fisher
- A breeding herd of 15 - 20 females and 6 -10 males is assembled by live trapping along the Alberta/NWT border. If insufficient animals *are* captured breeding stock may have to be purchased.
- Existing adult fox cages plus 1/2 an existing pelting shed are modified to handle fisher.
- There will be no significant revenue from fisher during the experimental period.

1. Securing Breeding Stock

a. Live Trapping

A permit to capture live wildlife will be required for live trapping any breeding stock in the Northwest Territories. This permit is required by the NWT Wildlife Act. The NWT Wildlife Service policy on such matters is to refer an application to the nearest community to the capture area, as well as to the Denendeh Conservation Board. There is no guarantee that a permit to capture live wildlife would be issued.

Added to the cost of a capture expedition is the cost of labour to feed and care for his herd while Magrum is trapping breeding stock. This is estimated at $2,500.00.

Lynx

The lynx cycle near Great Slave Lake is at or has passed the peak. If good numbers remain for the winter of 1990/91 it should not be difficult to capture the required number of lynx in an area trapped by the Magrums in the 70's and early 80's. If lynx numbers are down it will be difficult to capture the required number of lynx. All will be adult and therefore slower to adapt to captive conditions. The costs of live capture will require a camp and several flights by single otter from Yellowknife. An estimate to cover these expenses is $2,500.00.

Marten

Marten are relatively abundant in the area formerly trapped by the Magrums. They are readily captured and the required number could be captured in two or three trips in early winter. Marten can be captured from the same camp as lynx so a cost of $2,500.00 for marten for a combined cost of $5,000.00 for both species is ample for a capture expedition into the area southwest of Yellowknife On the

western shore of Great Slave Lake. Breeding marten in captivity is problematic. An experimental herd at the University of Manitoba in the 1960's had little success in this endeavor.

Fisher

Fisher are present but very rare around Great Slave Lake. It is unrealistic to expect to live trap sufficient animals for a productive breeding herd. Fisher stock will have to be purchased. An experimental herd is being developed in Manitoba. Preliminary indications from an official in the Government of Manitoba Department of Natural Resources indicated that securing animals from there is possible. Breeding fisher in captivity is problematic. Although they are relatively easy to keep, breeding success has not been achieved in experimental herds or in zoos.

b. Purchasing Breeding Stock

Lynx are currently held in several breeding herds in western Canada and Ontario. Lynx for breeding are available as kits for $1,200.00 to $1,500.00 each. They would come into breeding condition two years later. In a five year pilot project female kits purchased in 1991 would produce two litters maximum. Purchase of twenty females and six males would cost up to $40,000.00.

Marten

The authors are unaware of any experimental marten herds. It is difficult at this point to comment further on their availability or cost .

Fisher

Purchase of live fisher from Manitoba is estimated to cost approximately $750.00 each. The captive herd should include as many mature animals as possible.

2. **Cost** Estimates

Fixed Costs per annum:

Labour/management				45,500.00 /year	
Energy				4,000.00 /year	
Insurance				3,100.00	
Legal and Accounting Services				1,000.00 /year	
Equipment Maintenance, Repairs, Hardware				4,000.00 /year	
Cages:	Males	35.	@ 12.50	437.50	
	Female/litter	100.	@ 18.50	1,850.00	
	Pelters	350.	@ 7.00	2,450.00	
Leases	Land, at cost			1,200.00	
	*Facilities (buildings/sheds/cages)			12,000.00	
	**Equipment lease (mobile equipment & all infrastructure for farm operations)			15,000.00	
Total/annum (1990, pre GST)					90,537.50

Capital Cost:

Hired help on farm		2,500.00	
Fox		0.00	
Lynx	- modification to cages and pelter shed	10,000.00	
	capture, or (breeding stock)	2,500.00	(40,000.00)
	- trapping gear and holding cages	750.00	
Marten	- modification to cages and pelter shed	5,000.00	
	- capture	2,500.00	
	- box traps and holding cages	1,000.00	
Fisher	- modification to cages and pelter shed	7,500.00	
	- buy breeding stock	**20,000.00**	
Magrum	tour of existing experimental operations: **BC**, Manitoba, Ontario	7,500.00	
		59,250.00	96,750.00

* Lease costs based on: 5,000.00 for fur handling building
2,000.00 for each pelter shed
1,000.00 for cages

** Commercial rates for a vehicle, x 2 to capture all other equipment on the farm.

Table 15. Projected Feed and Medicine Costs for a Five Year Pilot Project

		Year cost	1991 ** No.of animals	1991 Total cost	1992 ** No.of animals	1992 Total cost	1993 ** No.of animals	1993 Total cost	1994 ** No.of animals	1994 Total cost	1995 ** No.of animals	1995 Total cost
Fox	**Males**	62.43	10	624.30	10	624.30	10	624.30	10	624.30	10	624.30
	Females	59.99	30	1,799.70	30	1,799.70	30	1,799.70	30	1,799.70	30	1,799.70
	Pups *	39.35	90	3,541.50	90	3,541.50	90	3,541.50	90	3,541,50	90	3,541.50
Marten	**Males**	21.51	8	172.08	8	172.08	8	172.08	8	172.08	8	172.08
	Females	21.24	20	424.80	20	424.80	20	424.80	20	424.80	20	424.80
	Kits *	14.87	2.8	41.26	5.6	82.53	8.3	123.79	13.9	206.32	27.8	412.64
Fisher	Males	74.17	8	593.36	8	593,36	8	593.36	8	593.36	8	593.36
	Females	71.89	20	1,437.80	20	1,437.80	20	1,437.80	20	1,437.80	20	1,437.80
	Kits *	47.43	2.8	132.79	5.6	265.58	8.4	398.37	14	663.95	28	1,327.90
Lynx	**Males**	171.19	8	1,369.52	8	1,369.52	8	1,369.52	8	1,369.52	**8**	1,369.52
	Females	285.46	20	5,709.20	20	5,709.20	20	5,709.20	20	5,709.20	20	5,709.20
	Kits *	124.06	3	372.17	6	744.33	9	1,116.50	15	1,860,83	30	3,721.65
Herd Size:			223		231		240		257		300	
Total :				16,218.48		16,764.70		17,310.92		18,403.36		21,134.45

* Sex ratio of **1:1** is assumed; cost to raise young is estimated at average of Males and Females.

** Assumes breeding success for each species as follows:

	1991	1992	1993	1994	1995
Fox Litters	30	30	30	30	30
Marten Litters	1	2	3	5	10
Fisher Litters	1	2	3	5	10
Lynx Litters	1	2	3	5	10

3. Revenues

Pelts

Table 16. Pelt Sales 1991 - 1995 (assumes a slow market)

Fox	**1991**	100. pelts @ 60.00	6,000.00
	1992	100. pelts @ 60.00	6,000.00
	1993	100. pelts @ 60.00	6,000.00
	1994	100. pelts @ 60.00	6,000.00
	1995	100, pelts @ 60.00	6,000.00
Lynx	1991	0. pelts @ 100.00	0.00
	1992	2. pelts @ 100.OO	200.00
	1993	5, pelts @ 100.00	500.00
	1994	10. pelts @ 1OO.OO	1,000.00
	1995	20. pelts @ 100.00	2,000.00
Marten	**1991**	0. pelts @ 90.00	0.00
	1992	2. pelts @ 90.00	180.00
	1993	5. pelts @ 90.00	450.00
	1994	10. pelts @ 90.00	900.00
	1995	20. **pelts** @ 90.00	1,800.00
Fisher	1991	0. pelts @ 90.00	0.00
	1992	2. pelts @ 90.00	180.00
	1993	5. pelts @ 90.00	450.00
	1994	10. pelts @ 90.00	900.00
	1995	20. pelts @ 90.00	1,800.00
			40,360.00

Estimated Revenue by Year:

	Fox	Lynx	**Marten**	Fisher	Total
1991:	6000.00	0.00	0.00	0.00	6,000.00
1992:	6000.00	200.00	180,00	180.00	6,560.00
1993:	6000.00	500.00	450.00	450.00	7,400.00
1994:	6000.00	1000.00	900.00	900.00	8,800.00
1995:	6000.00	2000.00	1800.00	1800.00	11,600.00

4. **Breeding** Stock

It will be difficult to assemble the numbers of breeding animals for 1991 envisaged in Table 15. There may be no surplus breeding stock during the life of the pilot project. In the event however, that surplus animals become available to sell as breeding stock, that option should be open under the terms of the **contract/lease** with **Magrum** Fur Ranch Ltd. Revenues should be applied to the pilot project budget.

Future sales of breeding stock is a distinct probability especially when the fur market returns. The current export fees **($25.00/animal** plus the current value of the pelt) should be waived with respect to animals produced under a Game Farm Licence.

Table 17. Projected Cash Flow Summary 1990 - 1995 (1990 $ and no **GST)**

Year	1991	1992	1993	1994	1995
Cost **Centre**					
Capital	59,250.00				
Management/Labour	45,500.00	45,500.00	45,500.00	45,500.00	**45,500.00**
operating Costs *	16,837.50	16,837,50	16,837.50	16,837.50	16,837.50
Leases	28,200.00	28,200.00	28,200.00	28,200.00	28,200.00
Feed/Medicine	16,218.48	16,764.70	17,310.92	18,403.36	21,134.45
Total	166,005.98	107,302.20	107,848.42	108,940.86	111,671.95
Revenue	6,000.00	6,560.00	7,400.00	8,800.00	11,600.00
Supplement Required	160,005.98	100,742.20	100,448.42	100,140.86	100,071.95

* Energy, Insurance, Legal/Accounting, Equipment maintenance, Cages.

The projected cash flow shows all capital costs will be incurred in the 1991 calendar year. It may be necessary to spread the costs of assembling the necessary breeding stock and associated construction over two years. The expenditure of capital funds should be sufficiently flexible to allow this. Table 17.a. shows the effect on cash flow of splitting capital costs between the first two years of the project.

Table 17.a. Projected Cash Flow Summary 1990 - 1995 (1990 $ and no GST)

Year	1991	1992	1993	1994	1995
Cost Centre					
Capital	29,625.00	29,625.00			
Management/Labour	45,500.00	45,500.00	45,500.00	45,500.00	45,500.00
Operating Costs *	16,837.50	16,837,50	16,837.50	16,837.50	16,837.50
Leases	28,200.00	28,200.00	28,200.00	28,200.00	28,200.00
Feed/Medicine	16,218.48	16,764.70	17,310.92	18,403.36	21,134.45
Total	**136,380.98**	**136,927.20**	**107,848.42**	**108,940.86**	**111,671.95**
Revenue	6,000.00	6,560.00	7,400.00	8,800.00	11,600.00
Supplement Required	130,380.98	130,367.20	100,448.42	100,140.86	100,071.95

* Energy, Insurance, Legal/Accounting, Equipment maintenance, Cages.

Operating costs will, in part, depend on the number of animals in the herd. The operating agreement with Magrum Fur Ranch Ltd. should cover fixed costs (contracts and leases) on a fixed cost basis with operating costs to be budgeted within an agreed upon upper limit per year. Standard small business accounting methods should be required. Mr. Magrum should have full spending authority over the operating budget and account.

s. Schedule

The schedule of Mr. **Magrum** depends in a large part on the requirements of the farm and the length of freeze-up. A **live** trapping expedition in 1990 could be done only after freeze-up in November,

This outline does not detail ongoing activities related to managing his fox herd on the premises. The existing fox herd will occupy facilities until December 1990.

1990

July — Prepare and sign lease agreements and contracts with GNWT - ED&T.

August — Tour existing experimental breeding sites in BC, Manitoba and Ontario

Get live capture permits to trap lynx and marten from GNWT - Renewable Resources.

September - Finalize design modifications to cages and pelter sheds.

- Modify spare breeding cages to receive live trapped animals.

Receive some fisher (if arrangements are made with Manitoba)

Ott./Nov. - Initial live trapping for marten and lynx.

December — Pelt out all but the best fox.

1991

January - Modify cages and sheds.
Live trap for lynx.

Feb.- Apr. - Live trap for lynx.
- Receive some fisher.

May - Sept. - Finish modifications for lynx, marten, fisher holding, breeding and pelting facilities.

Fall 1991 - Live trapping to complete experimental herd of 20 females and 6 - 10 males of each species.

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