

FOREWORD

This report, "Defining Parameters of Agricultural Potential in Alaska," is one of a series being published under the title CREATING A NORTHERN AGRICULTURE, by the Institute of Agricultural Sciences. The authorship is strictly that of Dr. Wayne E. Burton. Technical consultation has been provided by Dr. Minnie E. Wells. The content and conclusions are those of the author and do not necessarily reflect the views and policies of the University of Alaska, the Institute of Agricultural Sciences, or other Institute faculty.

The objective of these reports is to direct attention to opportunities for development of a northern agriculture, and to opportunities forgone if agriculture continues to be ignored in Alaska's land use and control planning process.

This series of reports rests squarely on the belief that substantial development of a northern agriculture would contribute materially to the economic and social well-being of Alaska's peoples, particularly after the boom of the petroleum industry is gone. Moreover, development of agriculture could provide the largest source of employment for Alaskans of any resource based industry.

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CREATING A NORTHERN AGRICULTURE

III. DEFINING PARAMETERS OF AGRICULTURAL POTENTIAL IN ALASKA

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III. DEFINING PARAMETERS OF AGRICULTURAL POTENTIAL IN ALASKA

Wayne E. Burton

"In the long run, we hit only what we aim at." . . . Thoreau.

Introduction

Alaska's current land-use planning is characterized by a particular void in providing for future agricultural development. One reason for this void in planning has been a profound lack in identification of production possibilities in most areas of the state. While the report, ALASKA'S AGRICULTURAL POTENTIAL (4), generally identified some 16 million acres suitable for tillage, and millions of acres suitable for livestock grazing, it did not provide other than a cursory review of product types which might be grown in Alaska. Further, it did not identify probable locations where particular crops and livestock would be produced, nor possible scope and magnitude of such industry development.

Public apathy regarding agriculture in Alaska will continue until such time as potential production parameters are established and recognized. Present negativistic images of agricultural possibilities in Alaska continue to be rationalized in terms of a miniscule, fragmented, and declining industry that now exists. Any extensive attempt to plan for agricultural development in Alaska will not only suffer innocuous assessments of agricultural possibilities but will be in competition, if not open conflict, with public planning for parks, wildlife refuges, ecological reserves, scenic and historic sites, public forests, petroleum and mineral provinces, and those lands identified for other real or conceived public uses (9). Moreover, this situation cannot be ethically resolved without informed and objective assessment of Alaska's latent agricultural production possibilities.

The present public planning for renewable and other resource-based industries in Alaska does not reflect the reality of long-run industry development possibilities. The fish and shellfish industry (5) has been expanded to near capacity in most areas, with returns to domestic fishermen being less than \$100 million and the wholesale value of processed fish being less than \$200 million in most years. The Alaska forest products industry (5), after a period of very rapid growth, has stabilized at an employment level of less than 1,200 workers and a wholesale product value of not more than \$100 million. While the fisheries industry appears to have little probability of significant expansion for domestic fishermen, the forest products industry appears at some future date to have the probability of doubling in size before reaching sustained harvest capacity.

Other resource-based industries such as recreation and minerals (excluding petroleum) receive a great deal more attention than agriculture in present land-use planning (9, 10). While tourism expenditures in Alaska are

estimated to approach \$50 million (5), typical optimistic projections have little probability of being realized since they have been based on trends established in a brief period of very rapid industry growth when personal disposable incomes were very high throughout the nation and the world. Also, Alaska's \$50 million mineral industry, even by the most optimistic projections, is not anticipated to substantially expand during the foreseeable future (5, 9, 11). Even though tourism and mining are both labor intensive, and highly seasonal, neither is anticipated to provide significant net additions to permanent employment in a relevant planning period.

In contrast, the agricultural industry appears to have definite possibilities for expanding from the present 600 workers, and a farm product value of \$5.5 million (2), to more than 55,000 workers and a farm product value in excess of \$4.0 billion per year, if serious attention is directed to its development. Expansion possibilities have been identified from the following considerations.

Supply of Agricultural Land

Alaska's agricultural lands are not yet fully identified. Estimates of latent agricultural lands, in various regions of the state, (Figure 1.) hinge on data available from the U. S. Department of Agriculture — Soil Conservation Service (SCS) and the Joint Federal-State Land Use Planning Commission for Alaska. While the available data (Table 1) are of exploratory grade, in most instances, they do reflect some 30 years of soils identification work within the state (4).

The first comprehensive investigation of soils in Alaska was made in 1946, and published in 1951. Detailed surveys have been made in the Tanana Valley, the Cook Inlet-Susitna Lowland, Kodiak Island, and a number of small areas elsewhere in the state. The statewide Exploratory Soil Survey of Alaska was initiated in 1967 by the SCS and was completed in 1973. The resulting mapping (4) shows only those areas with significant portions of the soils classed as suitable for farm tillage. Some areas considered marginally suitable for tillage, with present crops and states of technology, have been deleted. Small areas, and those with lesser portions of tillable lands, have not been identified.

Even though extensive acreages of latent agricultural lands have been identified in several regions of the state, only small acreages can be classed as mature agricultural soils. Most of the latent agricultural land has not been cleared, and is morphologically immature when initially prepared for tillage. Since the soils maturation process in this northern environment is not well understood, optimal tillage systems have not yet been identified. Other critical data such as fertilizer response and conservation measures are not available for most areas of the state. However, agricultural land-use projections have been based on classification data, more than seventy years of observation and experience in many areas, and many years of research in numerous locations.

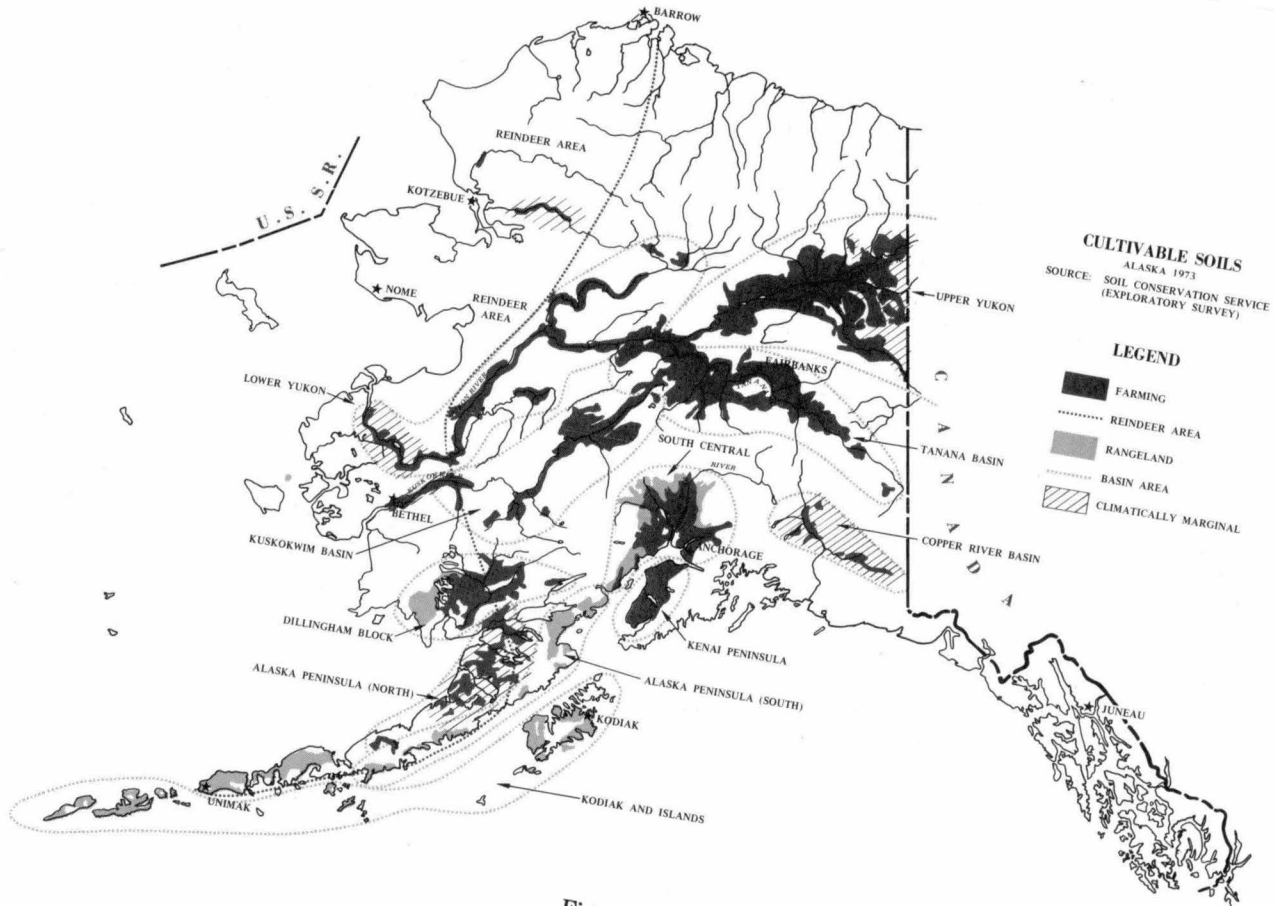


Figure 1.
Agricultural Regions of Alaska

Table 1.

ESTIMATED AGRICULTURAL LANDS AVAILABLE IN ALASKA FOR CROPS
INCLUDED IN THE STUDY.

Region	Class 1 (Group A)	Class 2 (Group A)	Class 3 (Group B)	Class 4 (Group B)	Class 5 (Group C)	Class 6 (Group C)	Range	Total
<i>(Thousand acres)</i>								
Upper Yukon Basin	1,626	1,571	1,625	724	--	--	a/	5,546
Lower Yukon Basin	--	233	--	1,372	75	232	a/	1,912
Tanana Basin	311	1,915	--	610	480	--	a/	3,316
South Central	1,247	--	--	116	--	409	1,134	2,907
Kenai Peninsula	545	--	--	--	--	237	210	992
Alaska Peninsula, S.	--	--	--	--	--	--	2,233	2,233
Dillingham Block	--	883	--	138	102	--	2,096	3,219
Alaska Peninsula, N.	--	--	--	--	345	674	1,163	2,182
Kuskokwim Basin	--	406	355	355	189	426	a/	1,731
Copper River Basin	153	--	--	14	15	104	a/	286
Kodiak and Islands	--	--	na.	na.	na.	na.	1,200	1,200
Reindeer Grazing Areas	--	--	--	--	--	--	100,000	100,000 b/
TOTAL	3,882	5,008	1,980	3,329	1,206	2,082	108,036	125,524

a/ No grazing lands were identified or included in calculations because of possible conflict with wildlife or other environmental factors.

b/ Estimates include only traditional reindeer grazing areas.

Data Source: USDA — SCS field notes adjusted by Federal-State Land Use Planning Commission work group.

Use of Agricultural Lands

Since not more than one eighth of one percent of potential tillable lands are presently being farmed, the following estimates of latent agricultural land use are necessarily projective in nature. The estimating process has been based on identification of possible enterprises, present and probable yields, future production systems, and identified land use requirements. Initial production estimates were calculated for those products needed for Alaska consumption (7). Subsequent estimates have been calculated for a fully developed agriculture on all identified agricultural lands within the state (8).

Land use estimates (Table 2) reflect the results of assessments regarding enterprise adaptation to climate and availability of suitable land, probable public institutions and services, transportation, labor requirements, nature of the product to be marketed, and proximity to population centers. The regional distribution of croplands, near population centers, reflects the projected needs of agricultural production for Alaska consumption. Lands in proximity to regional population centers have been identified for the intensive production of beef and swine, primarily for export. Least intensive land uses such as ranch beef, sheep, and reindeer have been identified for those areas which will continue to have low population densities. Also, more than 6 million acres, classed as suitable for tillage, have not been identified for crop production or grazing because of climatic or non-farm use projections (Appendix Table 1.)

Selected enterprises were identified through a systematic screening of crops and livestock types which could be produced in Alaska, and would have a good probability of entering intrastate and export markets (3, 4, 7). Land-use requirements have been calculated from enterprise budgets and projected yield estimates (8).

Agricultural Production

One of the more discernible measures of the scope and magnitude of probable agricultural production is that of quantities of various types of products, as typically reported by the U. S. Department of Agriculture's Statistical Reporting Service. Such quantities have been projected (Table 3) for each type of crop and livestock product, by region. All livestock quantities have been reported in pounds live-weight for net production. Milk and eggs have been reported as gross farm production of salable product. Cereal grains have been projected as gross farm yields. Hay/silage has been estimated as tons dry-matter in order to simplify aggregation of total quantities of harvested forage. Dry-matter estimates must be converted to actual harvested yields if hay or silage tonnages are desired.

Livestock and Poultry Numbers

A second discernible measure of the scope and magnitude of possible agricultural production is that of livestock numbers. Such have been

Table 2.

ESTIMATED USES OF IDENTIFIED AGRICULTURAL LANDS BY REGION

Region	Cereal Grains	Hay/Silage	Pasture	Vegetables and Fruits	Other a/	Range	Total
(Thousand Acres)							
Upper Yukon Basin	1,863	1,002	548	--	2,133	--	5,546
Lower Yukon Basin	445	473	259	--	735	--	1,912
Tanana Basin	1,041	615	314	3	1,343	--	3,316
Kenai Peninsula b/ c/	6	19	34	--	37	896	992
Alaska Peninsula, S.	--	--	--	--	--	2,233	2,233
Dillingham Block c/	233	262	197	--	431	2,096	3,219
Alaska Peninsula, N. b/	--	43	75	--	73	1,991	2,182
Kuskokwim Basin	403	428	234	--	666	--	1,731
Copper River Basin b/	2	6	10	--	10	258	286
Kodiak and Islands	--	--	--	--	--	1,200	1,200
Reindeer Grazing Areas	--	--	--	--	--	100,000	100,000
South Central	448	345	188	3	789	1,134	2,907
TOTAL	4,441	3,193	1,859	6	6,217	109,808	125,524

a/ Lands in farms not tilled, lands used in enterprises not identified, and identified agricultural lands not in farms.

b/ Lands classified as tillable have been allocated to "range" use, due to climatic limitations and assumed competing land uses.

c/ Some "non-tillable" lands classed as range.

projected (Table 4) for both annual farm and ranch inventories and for annual slaughter. Slaughter numbers reflect the anticipated number of animals that could be harvested each year. Poultry numbers represent the number of laying hens that would be needed to produce eggs for a projected 820,000 Alaskans (year 2000).

Farm Value of Agricultural Production

The most critical, and the most difficult, parameter to establish regarding Alaska's agricultural potential is that of annual value of farm production. Such a projection has been made (Table 5), using standardized planning data from the U. S. Water Resource Council (14). Future farm prices will undoubtedly deviate substantially from 1973 data, but such projections will provide one perspective of the possible scope and magnitude of a fully developed agriculture in Alaska. Calculated values reflect only prices received by farmers at the first point of sale.

Other Resources Used In Agricultural Production

Land use and agricultural production treats only one part of the latent farming industry picture. Many other Alaska resources make up another aspect. Certain factor inputs such as labor, fertilizer, petroleum fuels, and electricity, which could be provided from within Alaska, constitute industry development possibilities of significant magnitude, in addition to the farming sector.

Labor

A fully developed farming industry, in Alaska, would require more than 55,000 man-years of labor on farms, including some 8,000 trained and qualified management personnel. This estimate (Table 6) has been calculated from the U. S. average labor requirements for identified enterprises (1). The number of jobs would undoubtedly exceed man years of labor since some portion would be seasonal in nature. The farming sector alone would provide more employment than fisheries, forestry, tourism, and mineral industries combined. The agricultural processing, marketing, transportation, energy, input, and service industries would probably employ as many people as the farming sector.

Fertilizer

A fully developed agricultural industry, in Alaska, would require some 2.9 million tons of fertilizer. This estimate (Table 7) does not include that used for greenhouses, nurseries, public and private landscaping, revegetation projects, or recreation facility uses. A major portion could be produced from available phosphate and petroleum resources found in Alaska. Present nitrogen fertilizer production at Nikishka fully demonstrates the technical and economic feasibility of Alaska production. Large deposits of phosphates, suitable for fertilizer use, have been identified in the southern Brooks Range (10). These two fertilizer ingredients, nitrogen and

Table 3.

ESTIMATED LATENT AGRICULTURAL PRODUCTION, BY REGION*

Region	Beef lbs. (live wt.)	Pork lbs. (live wt.)	Lamb and Mutton (live wt.)	Reindeer lbs. (live wt.)	Milk lbs.	Eggs (doz.)	Veg. and Fruits (lbs.)	Cereal Grains (cwt.)	Hay/ Silage (tons-D.M.)
	(millions)								
Upper Yukon Basin	873	1,833	--	--	--	--	S	67.2	4.1
Lower Yukon Basin	412	--	--	--	--	--	S	16.0	1.9
Tanana Basin	503	935	--	--	300	6.7	73.8	37.6	2.5
South Central	265	316	--	--	150	6.7	73.8	16.2	1.4
Kenai Peninsula	26	a/	a/	--	a/	a/	a/	0.3	0.08
Alaska Peninsula, S.	32	--	--	--	--	--	a/	--	--
Dillingham Block	250	--	--	--	a/	a/	a/	8.4	1.07
Alaska Peninsula, N.	58	--	--	u/	--	--	a/	--	0.18
Kuskokwim Basin	373	--	--	--	a/	a/	a/	14.5	1.8
Copper River Basin	8	--	--	--	--	--	a/	0.07	0.02
Kodiak and Islands	13	a/	1.5	u/	a/	--	a/	--	--
Reindeer Areas	--	--	--	26.4	--	--	a/	--	--
TOTAL	2,813	3,134	1.5	26.4	450	13.4	147.6	160.27	13.05

* Estimated latent agricultural production calculated from regional data found Appendix Table I.

a/ Subsistence

u/ Undetermined

Table 4.

**ESTIMATED LIVESTOCK AND POULTRY NUMBERS TO ACCOMPLISH LATENT
AGRICULTURAL PRODUCTION POSSIBILITIES IN ALASKA, BY REGION***

Region	Cattle In Herd	Swine In Herd	Sheep In Herd	Reindeer In Herd	Dairy Cattle In Herd	Poultry In Flock	Cattle Slaughter	Swine Slaughter	Sheep Slaughter	Reindeer Slaughter
	(Thousands)									
Upper Yukon	1,673	4,602	--	--	--	--	767	8,261	--	--
Lower Yukon	789	--	--	--	--	--	362	--	--	--
Tanana Basin	958	2,284	--	--	33	325	441	4,101	--	--
South Central	521	772	--	--	17	325	253	1,387	--	--
Kenai Peninsula	58	--	--	--	--	--	25	--	--	--
Alaska Peninsula, S.	71	--	--	--	--	--	30	--	--	--
Dillingham Block	497	--	--	--	--	--	223	--	--	--
Alaska Peninsula, N.	129	--	--	--	--	--	55	--	--	--
Kuskokwim Basin	715	--	--	--	--	--	328	--	--	--
Copper River Basin	23	--	--	--	--	--	7	--	--	--
Kodiak and Islands	40	--	35	--	--	--	12	--	14	--
Reindeer Areas	--	--	--	400	--	--	--	--	--	80
Total	5,474	7,658	35	400	50	650	2,503	13,749	14	80

* Calculated from Appendix Table I, (8).

Table 5.

**ESTIMATED ANNUAL VALUE OF CROP PRODUCTION
ON LATENT AGRICULTURAL LANDS, BY REGION***

Region	Beef	Pork	Lamb and Mutton	Reindeer	Milk	Eggs	Veg. and Fruit	Cereal Grains	Hay and Silage	Total
(Million dollars)										
Upper Yukon Basin	373.64	723.07						403.20	201.34	\$1,701.25
Lower Yukon Basin	176.34							96.00	93.18	365.52
Tanana Basin	215.28	359.04			21.39	3.48	4.02	221.90	122.72	947.83
South Central	113.42	121.34			10.70	3.48	4.02	95.64	68.64	417.24
Kenai Peninsula	11.13							1.80	3.74	16.67
Alaska Peninsula, S.	13.70									13.70
Dillingham Block	107.00							50.40	52.42	209.82
Alaska Peninsula, N.	24.82								8.74	33.56
Kuskokwim Basin	159.64							87.00	88.19	334.83
Copper River Basin	3.42							0.42	0.83	4.67
Kodiak and Islands	5.56		0.53							6.09
Reindeer Area				14.08						14.08
Total	\$1,203.95	1,203.45	0.53	14.08	32.09	6.96	8.04	956.36	639.80	\$4,065.26

* Price data — U. S. Water Resource Council, Agricultural Price Standards, Guideline 2, (14), and USDA Agricultural Statistics — 1974 (1).

phosphorus, constitute a major portion of the critical fertilizer requirements for development of an Alaskan agricultural industry.

Petroleum Fuels

An Alaskan agricultural industry, as previously described, would require about 439 billion Btu's of energy for farm production alone. This would probably be provided by 83.309 million gallons of diesel fuel (Table 8), 125.363 million gallons of gasoline (Table 9), and 41.718 million gallons of L-P gas (Table 10) along with 455 million kilowatt-hours of electricity (Table 11). Such quantities of petroleum fuels, excluding that used in generating electricity, would require more than 7 million barrels of crude oil per year to refine those needed for farm use.

Energy requirements for the farm production sector make up only a small portion of that used in the agricultural food industry. Percentages used in the various sectors, as identified for the United States, are: farm production 22 percent, farm family living 12 percent, food processing 28 percent, marketing and distribution 18 percent, and the selected input industries 20 percent (not including feed stock used in fertilizer production) (12).

The farm family living sector would require some 231.24 billion Btu's of energy which would probably come from the following: gasoline 32.4 percent, diesel and distillate 21.5 percent, L-P and natural gas 26.5 percent, electricity 15.7 percent, and coal 4.9 percent.

The food processing industry, generated by a fully developed Alaskan agricultural industry, would require about 537 billion Btu's of energy, and this would be provided from gasoline 0.6 percent, distillate and fuel oil 10.7 percent, L-P and natural gas 48.4 percent, electricity 30 percent, coal 9.9 percent, and other 0.4 percent, if it followed the present U. S. pattern.

The marketing and distribution sector, including both transport of food products to consumers and transport of production inputs to farms, would require at least 347 billion Btu's of energy and could require as much as 500 billion Btu's of energy. Some 91 percent would come from diesel fuels and about 9 percent would come from gasoline.

Input manufacturing would require some 385 billion Btu's of energy, and the energy sources would probably be broken down in the following manner: L-P and natural gas 82.9 percent, electricity 12.4 percent, distillate and fuel oil 2.8 percent, coal 1.1 percent, and gasoline 0.1 percent (if it followed the present U. S. pattern).

A cursory perusal of the crude petroleum requirements, resulting from a fully developed Alaskan agriculture, would indicate: farm production 7 million barrels, other sectors of the agricultural food industry 24 million barrels, fertilizer and petroleum fuels production 15 to 20 million barrels, and the equivalent of 18 million barrels for household preparation of food products (6, 12).

Table 6.

ESTIMATED MAN YEARS OF LABOR REQUIRED TO ACCOMPLISH
LATENT AGRICULTURAL PRODUCTION IN ALASKA, BY REGION*

Region	Beef	Pork	Lamb and Mutton	Reindeer	Milk	Eggs	Vegetables and Fruits	Regional Total
	(Man Years) a/							
Upper Yukon Basin	10,761	11,410	--	--	--	--	--	22,171
Lower Yukon Basin	5,080	--	--	--	--	--	--	5,080
Tenana Basin	6,164	5,665	--	--	1,174	161	55	13,219
South Central	3,302	1,915	--	--	588	161	55	6,021
Kenai Peninsula	300	--	--	--	--	--	--	300
Alaska Peninsula, S.	265	--	--	--	--	--	--	265
Dillingham Block	3,018	--	--	--	--	--	--	3,018
Alaska Peninsula, N.	649	--	--	--	--	--	--	649
Kuskokwim Basin	4,598	--	--	--	--	--	--	4,598
Copper River Basin	91	--	--	--	--	--	--	91
Kodiak and Islands	107	--	20	--	--	--	--	127
Reindeer Grazing Areas	--	--	--	300	--	--	--	300
Product Enterprise								
TOTAL	34,335	18,990	20	300	1,762	322	110	55,839

* Acreage and production data from regional tables found in Appendix 1, (8).

a/ Calculated from Agricultural Statistics — 1973, Tables 651 and 652, page 449.

Table 7.

**ESTIMATED CROP FERTILIZER REQUIREMENTS FOR
LATENT AGRICULTURAL LANDS, BY REGION***

Region	Cereal Grainings	Hay/Silage	Pasture	Vegetables and Fruits	Other**	Range	Total
(Tons - thousands)							
Upper Yukon Basin	186.3	165.5	576.0		u		927.8
Lower Yukon Basin	13.8	88.1	306.7		u		408.6
Tanana Basin	105.1	125.7	384.0	2.2	u		617.0
South Central	42.9	82.3	196.8	2.2	u		324.2
Kenai Peninsula	1.1	7.4	12.9		u		21.4
Alaska Peninsula, S. Dillingham Block	11.1	57.6	165.5				234.2
Alaska Peninsula, N.		14.8	25.8		u		40.6
Kuskokwim Basin	10.1	66.0	229.8				305.9
Copper River Basin	0.3	2.0	3.6				5.9
Kodiak and Islands Reindeer Grazing Areas							
TOTAL	370.7	609.4	1,901.1	4.4	u		2,885.7

* Estimates derived from published and unpublished data, judgements of professional agriculturalists, and information provided from research in progress.

** Data not available on enterprises which have not been treated in this research effort.

Table 8.

**ESTIMATED DIESEL FUEL USE FOR LATENT AGRICULTURAL
PRODUCTION (ON FARM), BY REGION***

Region	Beef	Pork	Lamb and Mutton	Reindeer	Milk	Eggs	Vegetables and Fruits	Regional Totals
(thousand gallons)								
Upper Yukon Basin	22,064	8,140						30,204
Lower Yukon Basin	10,413							10,413
Tanana Basin	12,634	4,041			727	26	23	17,451
South Central	7,244	1,366			363	26	23	9,022
Kenai Peninsula	524							524
Alaska Peninsula, S.	a/							a/
Dillingham Block	5,074							5,074
Alaska Peninsula, N.	1,040							1,040
Kuskokwim Basin	9,430							9,430
Copper River Basin	151							151
Kodiak and Islands	a/		a/					a/
Reindeer Area	a/			a/				a/
TOTALS	68,574	13,547			1,090	52	46	83,309

* Diesel Fuel Use — U. S. Senate Committee on Agriculture and Forestry, The U. S. Food and Fiber Sector: Energy Use and Outlook, Sept. 1974; B.T.U. data from The Yearbook of Agriculture — 1960: Power to Produce, (includes all farm use).

Table 9.

ESTIMATED GASOLINE FUEL USE FOR LATENT AGRICULTURAL
PRODUCTION (ON FARM), BY REGION*

Region	Beef	Pork	Lamb and Mutton	Reindeer	Milk	Eggs	Vegetables and Fruits	Regional Total
(thousand gallons)								
Upper Yukon Basin	33,201	12,249						45,450
Lower Yukon Basin	15,670							15,670
Tanana Basin	19,012	6,081			1,094	38	35	26,260
South Central	10,900	2,056			547	38	35	13,576
Kenai Peninsula	789							789
Alaska Peninsula, S.	a/							a/
Dillingham Block	7,635							7,635
Alaska Peninsula, N.	1,565							1,565
Kuskokwim Basin	14,191							14,191
Copper River Basin	227							227
Kodiak and Islands	a/		a/					a/
Reindeer Grazing Area	a/			a/				a/
TOTALS	103,190	20,386			1,641	76	70	125,363

* Gasoline Fuel Use — U.S. Senate Committee on Agriculture and Forestry, The U.S. Food and Fiber Section: Energy Use and Outlook, Sept. 1974; B.T.U. data from The Year Book of Agriculture 1960 — Power to Produce, (Includes all Farm Use).

a/ Not available.

Table 10.

**ESTIMATED L-P GAS USE FOR LATENT AGRICULTURAL
PRODUCTION (ON FARM), BY REGION***

Region	Beef	Pork	Lamb and Mutton	Reindeer	Milk	Eggs	Vegetables and Fruits	Regional Totals
(thousand gallons)								
Upper Yukon Basin	11,048	4,076						15,124
Lower Yukon Basin	5,214							5,214
Tanana Basin	6,326	2,024			364	13	12	8,739
South Central	3,627	684			182	13	12	4,518
Kenai Peninsula	263							263
Alaska Peninsula, S.	a/							a/
Dillingham Block	2,541							2,541
Alaska Peninsula, N.	521							521
Kuskokwim Basin	4,722							4,722
Copper River Basin	76							76
Kodiak and Islands	a/		a/					a/
Reindeer Area	a/			a/				a/
TOTALS	34,338	6,784			546	26	24	41,718

* L-P gas use — U. S. Senate Committee on Agriculture and Forestry, The U. S. Food and Fiber Sector: Energy Use and Outlook, Sept. 1974; B.T.U. data from The Year Book of Agriculture — 1960: Power to Produce. (Includes all farm use).

a/ Not available.

Table 11.

**ESTIMATED ELECTRICITY USE FOR LATENT AGRICULTURAL
PRODUCTION (ON FARM), BY REGION***

Region	Beef	Pork	Lamb and Mutton	Reindeer	Milk	Eggs	Vegetables and Fruits	Regional Totals
(million kilowatt hours)								
Upper Yukon Basin	120.7	44.5						165.2
Lower Yukon Basin	56.9							56.9
Tanana Basin	69.1	22.1			4.0	0.1	0.1	95.4
South Central	39.6	7.5			2.0	0.1	0.1	49.3
Kenai Peninsula	2.9							2.9
Alaska Peninsula, S.	a/							a/
Dillingham Block	27.8							27.8
Alaska Peninsula, N.	5.7							5.7
Kuskokwim Basin	51.6							51.6
Copper River Basin	0.8							0.8
Kodiak and Islands	a/		a/					a/
Reindeer Area				a/				a/
TOTALS	375.1	74.10			6.0	0.2	0.2	455.6

* Kilowatt hours use — U. S. Senate Committee on Agriculture and Forestry, The U. S. Food and Fiber Sector: Energy Use and Outlook, Sept. 1974, (Includes all farm use).

a/ Not available.

Electricity

Farm use of electricity, as previously noted, would require more than 455 million kilowatt-hours *per annum*, based on typical use patterns in the United States today. This estimate does not include that which would be used by farm families (790 mil. kw.-hr.), in agricultural food processing (3,550 mil. kw.-hr.), or in input manufacturing (1,045 mil. kw.-hr.). Identified petroleum reserves, coal deposits, geothermal and wind sources, and hydroelectric possibilities within Alaska constitute more than ample energy sources for added generating capacity needed in developing Alaska's latent agricultural industry.

Factor Input Costs for Farm Production

There is little basis for accurately projecting farm production input costs, at this time, other than as a percentage of projected farm sales comparable to that reported for the rest of the country (1). The following estimates are for a fully developed Alaskan agriculture, as previously identified, using data from AGRICULTURAL STATISTICS — 1973.

Estimated Farm Production Expenses

Feed purchased	\$556,311,000
Livestock purchased	414,338,000
Seed	66,556,000
Fertilizer and lime	161,836,000
Repair and operation of capital items	336,293,000
Depreciation etc.	487,739,000
Hired labor	255,313,000
Taxes on farm property	201,226,000
Interest on farm mortgage debt	126,144,000
Net rent	88,802,000
Miscellaneous	361,075,000
Total	\$3,055,633,000

The above estimates provide some perspective of the relative scale of various farm production expenditures, and consequently some perspective of the scope and magnitude of possible farm service and supply industries. It must be noted, however that the combination of farm production expenses in Alaska might be quite different than found in the 1974 AGRICULTURAL STATISTICS, which has been used as a base for calculating the reported estimates even though costs as a percentage of sales might be quite comparable.

Farm Machinery and Equipment

While it is not expected that Alaska's agriculture would be large enough to support a farm machinery and equipment manufacturing industry, it would provide opportunity for a substantial sales and service industry. A partial list of the projected annual sales of farm machinery is as follows:

Tractors	1875
Plows	470
Field cultivators	140
Power sprayers	370
Side delivery rakes	150
Pickup hay balers	220
Field forage harvesters	190
Combines	200
Manure spreaders	280
Power grinders and crushers	50
Silo unloaders	160

At 1973 (stateside) prices the estimated annual sales would approach 40 million dollars, and this does not include possible sales of several million dollars of irrigation equipment each year.

Capital Investment in Farm Production Sector

As noted previously, estimates of this type are inevitably subjective, and must be approached with caution. However, the ratio of farm sales to farm assets, derived from 1973 nation-wide data, would indicate a capital investment of more than \$1,800 an acre for a fully developed mature farming industry in Alaska. This would indicate a need for capital investment of at least \$2,500 per acre to bring large blocks of latent agricultural lands into production, for land acquisition, clearing, soil development tillage and fertility additions, construction of buildings and facilities, purchase of machinery and equipment, and initial operating capital. Estimated capitalization for a fully developed farm production sector, by region, (Table 12) would indicate some \$23.9 billion in farm assets — at 1973 prices.

Distribution of Latent Agricultural Production

The scope of this report does not allow treatment of transportation, processing, and distribution sectors of Alaska's latent agricultural industry, but general estimated of intrastate and export commodity uses (Table 13) do provide some perspective of the scope and magnitude of those sectors. It should be noted that export products include beef, pork, reindeer products, milk and wool. As noted previously, this report does not include ornamental, environmental, and horticultural crops which could be exported when production is developed for those crops.

Table 12.

ESTIMATED CAPITALIZATION FOR ALASKA'S LATENT FARMING REGIONS*

Region	Value As A Mature Industry	Value Per Acre (tillable)	Value Per Acre (range)	Value of New Development
	<i>(millions)</i>	<i>(dollars)</i>	<i>(dollars)</i>	<i>(millions)</i>
Upper Yukon Basin	\$10,007	\$2,346	\$ --	\$12,409
Lower Yukon Basin	2,150	1,461	--	2,666
Tanana Basin	5,575	2,260	--	6,913
South Central	2,454	2,460	30	3,043
Kenai Peninsula	98	939	30	122
Alaska Peninsula, S.	81	--	36	100
Dillingham Block	1,234	1,354	30	1,530
Alaska Peninsula, N.	198	933	30	246
Kuskokwim Basin	1,970	1,480	--	2,443
Copper River Basin	28	877	30	35
Kodiak and Islands	36	--	30	45
Reindeer Grazing Areas	83	--	0.83	103
TOTAL	\$23,914			\$29,655

* Asset values calculated from estimated sales and acres in farms and range, and reflect values of all components of a going farming concern. (1973 prices)

Table 13.

**ESTIMATED DISTRIBUTION OF LATENT AGRICULTURAL
PRODUCTION FROM IDENTIFIED LANDS IN ALASKA**

Product	For Alaska Consumption a/	For Export	Total Production
Beef (mil. lbs. dressed wt.)	95.5 b/	1,557.1	1,652.6
Pork (mil. lbs. dressed wt.)	51.7	2,298.8	2,350.5
Lamb and Mutton (mil. lbs. dressed wt.)	0.8	--	0.8
Reindeer (mil. lbs. dressed wt.)	0.8 c/	12.4	13.2
Milk (mil. lbs.)	200.0	250.0	450.0
Eggs (mil. doz.)	13.4	--	13.4
Wool (mil. lbs.)	--	0.4	0.4
Reindeer Skins (thousands)	10.0	70.0	80.0
Reindeer Antlers (thousand lbs.)	--	1,000.0	1,000.0
Barley (thousand tons)	8,014.0	--	8,014.0
Oats (thousand tons)	27.8	--	27.8
Hay/Silage - D.M. (thousand tons)	13,050.0	--	13,050.0
Veg. and Potatoes (thousand tons)	79.3	--	79.3
Fruits and Berries (thousand tons)	1.4	--	1.4

a/ Estimated consumption for 820 thousand population (year 2000), Alaska's Agriculture, An Analysis of Development Problems, Univ. of Alaska, ISEGR Report No. 30, Table XXXIX p. 162.

b/ Adjusted to 1970 U. S. Consumption Average for beef and veal. Does not include consumption due to tourism and part-year worker population.

c/ Estimated trend increase in consumption.

Summary and Conclusions

Alaska's agricultural development planning has suffered neglect, apathy, and innocuous assessments because of the recalcitrance of public agencies and institutions to objectively and comprehensively identify parameters of latent agricultural possibilities in Alaska. This situation has resulted from negativistic images created by a miniscule, fragmented, and declining agricultural "industry", unreal assessments of other resource based industry potentials, and profound voids in agricultural industry planning data. The situation has been further complicated by the overly aggressive pursuit of environmental "objectives" and public planning for parks, wildlife refuges, ecological reserves, scenic and historic sites, public forests, and petroleum and mineral provinces, without due consideration to the future social and economic well-being of the Native people and other residents of Alaska.

This report should provide one perspective of the scope and magnitude of latent agricultural production potential in Alaska. It further identifies some 17.5 million acres of tillable lands, by region. While climatic limitations, geographic locations, and competing land uses introduce uncertainties in projecting future agricultural uses, production estimates have been made for 9.5 million acres of tillable soils, 9.8 million acres of domestic livestock range, and 100 million acres of reindeer grazing. Particular care has been exercised in deleting possible crop and grazing lands where severe climatic or competing land uses were recognized.

Projected agricultural land uses have been identified in several ways. Field crop uses have been identified for 4.5 million acres of cereal grains, 3.2 million acres of hay and silage, 1.9 million acres of cultivated pasture, and 6,000 acres of fruits and vegetables. Livestock uses have been identified for 5.5 million cattle, 7.7 million hogs, 35,000 sheep, 400,000 reindeer, 50,000 dairy cattle, and 650,000 poultry. Less extensive land-using crops, i.e. greenhouse, nursery, grass seed, environmental, and recreation, have not been identified.

An annual value of agricultural production, at the first point of sale, has been identified as being in excess of 4 billion dollars. This projection has been based on estimates of sales of 1.7 billion pounds of beef, 2.4 billion pounds of pork, 800,000 pounds of lamb and mutton, 13.2 million pounds of reindeer meat, 450 million pounds of milk, 13.4 million dozen eggs, 400,000 pounds of wool, 80,000 reindeer skins, 1 million pounds of (velvet) reindeer antlers, 8.0 million tons of barley, 27,800 tons of oats, 13.0 million tons (dry matter) of hay and silage, 79,300 tons of vegetables including potatoes, and 1,400 tons of fruits and berries.

A second component of Alaska's potential agricultural industry, which has not previously been identified, is that of factor inputs used in farm production. A fully developed farming industry would require more than 55,000 man-years of labor, petroleum fuels from more than 7 million barrels of crude oil, 2.9 million tons of fertilizers, 455 million kilowatt hours of

electricity, and in excess of 40 million dollars of new machinery and equipment each year. Farm production expenses have been estimated at 3.0 billion dollars, which provides additional perspective regarding the probable scope and magnitude of potential farm support industries.

The capital investment (asset value) per acre of agricultural production, excluding extensive rangeland, has been projected as being \$1,800, and about \$2,500 per acre for bringing new lands into production. These estimates include all investments in land, buildings and facilities, machinery and equipment, livestock, etc. A projected value of a fully developed mature farming industry in Alaska would indicate constant farm assets of more than \$23.9 billion (at 1973 prices). Moreover, such estimates would indicate initial farming industry development costs of some \$30 billion.

The time element of full agricultural development in Alaska has not been addressed in this report since the intent has been only to provide definitive parameters for the development planning process. The data provided should allow planning assessments of production possibilities within each region of latent agricultural lands. It should also allow ethical assessments of Alaska's agricultural production possibilities in comparison with other resource based industries and conflicting public land uses, if public goals are to fully address the future social and economic well-being of Alaska's present and future peoples.

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APPENDIX

APPENDIX TABLE 1
ESTIMATED LATENT AGRICULTURAL LAND USE
AND PRODUCTION, BY REGION

<u>Region</u>	<u>Present Standards (a)</u>	<u>Projected Standards (b)</u>
UPPER YUKON RIVER BASIN (above Tanana)		
Agricultural Lands:		
	(acres)	
(Class 1 (c))	1,626,000	No grazing lands were identified or included because of possible conflict with wildlife and other environmental factors.
Class 2	1,571,000	
Class 3	1,625,000	
Class 4	724,000	

Tillable Acres	5,546,000	
Non-tillable	0	
TOTAL ACRES	5,546,000	
Estimated Production:		
BEEF (Intensive Farm System)		
Net Product (live wt.)	473 Mil. lbs.	873 Mil. lbs.
Cattle in Herd (no.)	906,268 head	1,672,668 head
Slaughter (no.)	415,374 head	766,642 head
Crop Acres Required:		
Barley	958,621 acres	943,416 acres
Hay/Silage	1,067,448	1,001,889
Pasture	467,009	548,072
Other	1,558,115	1,557,816
TOTAL ACRES	4,051,193	4,051,193
PORK (Controlled Environment System) (live weight)		
Net Product (live wt.)	944 Mil. lbs.	1,883 Mil. lbs.
Hogs in Herd		
(at one time)	2,305,814	4,602,180
Slaughter (during year)	4,138,960	8,260,960

- (a) Present standards are a composite of statistical data (1970) and judgements of professional agriculturalists, Table XL; page 165, (7).
- (b) Projected standards assume committed public resources and dedicated public research and service inputs. These standards were projected for year 2000, but could be attained at a much earlier date, Table XLIII, page 168, (7).
- (c) Refers to S.C.S. map classes in *Alaska's Agricultural Potentials*, Alaska Rural Development Council, Publication No. 1, pp. 20-21, (4).

Crop Acres Required:

Barley	919,881 acres	919,881 acres
Other	574,926	574,926
<u>TOTAL ACRES</u>	<u>1,494,807</u>	<u>1,494,807</u>

LOWER YUKON RIVER BASIN (below Tanana)

Agricultural Lands:

	(acres)	
Class 2 (c)	233,000	No grazing lands were identified or included because of possible conflict with wildlife and other environmental factors.
Class 4	1,372,000	
Class 5	75,000	
Class 6	232,000	
	<u>1,912,000</u>	
Tillable Acres	1,912,000	
Non-tillable	0	
<u>TOTAL ACRES</u>	<u>1,912,000</u>	

Estimated Production:

BEEF: (Intensive Farm System)

Net Product (live wt.)	223.3123 Mil. lbs.	411.8914 Mil. lbs.
Cattle in Herd (no.)	427,866 head	789,184 head
Slaughter (no.)	196,106 head	361,711 head

Crop Acres Required:

Barley	452,431	445,255
Hay/Silage	503,793	472,851
Pasture	220,409	258,668
Other	<u>735,367</u>	<u>735,226</u>
<u>TOTAL ACRES</u>	<u>1,912,000</u>	<u>1,912,000</u>

TANANA RIVER BASIN

Agricultural Lands:

	(acres)	
Class 1 (c)	311,000	No grazing lands were identified or included because of possible conflict with wildlife and other environmental factors.
Class 2	1,915,000	
Class 4	610,000	
Class 5	480,000	
	<u>3,316,000</u>	
Tillable Acres	3,316,000	
Non-tillable	0	
<u>TOTAL ACRES</u>	<u>3,316,000</u>	

Estimated Production:

MILK (Controlled Environment System)

Net Product	300 Mil. lbs.	300 Mil. lbs.
Cattle in Herd	45,035 head	33,470 head
Beef (from cull slaughter)	3.8 Mil. lbs.	2.8 Mil. lbs.

Crop Acres Required:

Barley	53,052 acres	28,295 acres
Oats	17,021	12,860
Hay/Silage	80,704	41,005
Other	94,236	51,225
TOTAL ACRES	<u>245,013</u>	<u>133,385</u>

BEEF (Intensive Farm System)

Net Product (live wt.)	271 Mil. lbs.	500 Mil. lbs.
Cattle in Herd (no.)	519,123	957,503
Cattle Slaughter (no.)	237,932	438,857

Crop Acres Required:

Barley	548,926	540,220
Hay/Silage	611,243	573,702
Pasture	267,419	313,837
Other	892,208	892,037
TOTAL ACRES	<u>2,319,796</u>	<u>2,319,796</u>

PORK (Controlled Environment System)

Net Product (live wt.)	464 Mil. lbs.	935 Mil. lbs.
Hogs in Herd (at one time)	1,133,552 head	2,284,205 head
Hog Slaughter	2,035,104 head	4,100,910 head

Crop Acres Required:

Barley	452,116 acres	456,683 acres
Other	282,573	285,427
TOTAL ACRES	<u>734,689</u>	<u>742,110</u>

EGGS (Controlled Environment System)

Net Product (eggs)	6.7 Mil. doz.	6.7 Mil. doz.
Poultry in Flock	325,000	325,000

Tillable Acres Required:

Barley	5,417	2,889
Other	3,386	1,806
TOTAL ACRES	<u>8,803</u>	<u>4,695</u>

VEGETABLES AND BERRIES (Field Production Systems)

Vegetable and Potatoes	36,206 tons	32,206 tons
Berries	693 tons	693 tons

Tillable Acres Required:

Potatoes	2,550	1,433
Cabbage	112	35
Carrots	194	84
Celery	90	59
Lettuce	1,185	503

Peas	255	204
Other Vegetables	101	101
Sub-Total	4,487	2,418
Strawberries	190	142
Other Berries	62	36
Sub-Total	252	178
Tilled Acres	4,789	2,596
Other	2,962	1,792
TOTAL ACRES	7,701	4,388

SOUTH CENTRAL (not including the Kenai Peninsula)

Lands:

	(acres)
Class 1 (c)	1,247,000
Class 4	116,000
Class 6	409,000
Tillable Acres	1,773,000
Non-tillable (range)	1,134,000
TOTAL ACRES	2,907,000

Estimated Product:

MILK: (Controlled Environment Systems)

Net Product	150 Mil. Lbs.	150 Mil. lbs.
Cattle in Herd	22,517 head	16,735 head
Beef (from cull slaughter)	1.9 Mil. lbs.	1.4 Mil. lbs.

Crop Acres Required:

Barley	26,526 acres	14,148 acres
Oats	8,510	6,430
Hay/Silage	40,351	20,402
Other	47,117	25,613
TOTAL ACRES	122,504	66,593

BEEF (Range Livestock System) (d)

Net Product (live wt.)	33 Mil. lbs.	33 Mil. lbs.
Cattle in Herd (no.)	73,491 head	73,491 head
Cattle Slaughter (no.)	31,185	31,185 head

Crop Acres Required:

Barley	15,038	8,019 acres
Hay/Silage	48,296	24,432
Pasture	85,050	42,522
Other	92,440	46,858

Tillable Acres	240,824	121,831
Non-tillable (range)	1,134,000	1,134,000
TOTAL ACRES	1,374,824	1,255,831

BEEF (Intensive Farm System) (e)

Net Product (live wt.)	117 Mil. lbs.	234 Mil. lbs.
Cattle in Herd	224,903 head	447,903 head
Cattle Slaughter	103,061 head	220,913 head

Crop Acres Required:

Barley	237,815 acres	252,705 acres
Hay/Silage	264,813	268,368
Pasture	115,855	146,808
Other	386,537	417,279
Tillable Acres	1,005,020	1,085,160
Non-tillable (range)	0	0
TOTAL ACRES	1,005,020	1,085,160

PORK (Controlled Environment Systems)

Net Product (live wt.)	154 Mil. lbs.	316 Mil. lbs.
Hogs in Herd		
(at one time)	375,498 head	772,302 head
Hogs Slaughter		
(during year)	674,144 head	1,386,540 head

Crop Acres Required:

Barley	149,827 acres	154,394 acres
Other	93,642	96,496
Tillable Acres	243,469	250,890
Non-tillable	0	0
TOTAL ACRES	243,469	250,890

EGGS (Controlled Environment System)

Net Product (eggs)	6.7 Mil. doz.	6.7 Mil. doz.
Poultry in flock	325,000	325,000

Tillable Acres Required

Barley	5,417 acres	2,889 acres
Other	3,386	1,806
TOTAL ACRES	8,803	4,695

VEGETABLES AND BERRIES (Field Production Systems)

Vegetable and Potatoes	36,206 tons	36,206 tons
Berries	693 tons	693 tons

Tillable Acres Required:

Potatoes	2,550	1,433
Cabbage	112	35

Carrots	194	84
Celery	90	59
Lettuce	1,185	503
Peas	255	204
Other Vegetables	101	101
Sub-Total	4,487	2,418
Strawberries	190	142
Other Berries	62	36
Sub-Total	252	178
Tilled Acres	4,789	2,596
Other	2,962	1,792
TOTAL ACRES	7,701	4,388

INTRASTATE SHIPMENT (To Supply Feed Requirements of Alaska Peninsula-Southside-beef and Kodiak and Islands District-beef and sheep).

Crop Acres Required:

Barley	21,588 acres	11,787 acres
Hay/Silage	67,249	34,835
Other	55,541	29,138
TOTAL ACRES	144,378	75,760

KENAI PENINSULA

Lands:

	(acres)
Class 1 (c)	545,000
Class 6	237,000
Tillable Acres	782,000
Non-tillable (1/4 of 840,000)	210,000
TOTAL ACRES	992,000

The range livestock system of Beef Production was selected to minimize possible conflict with wildlife and recreation.

BEEF (Range Livestock System) (d)

Net Product (live wt.)	24 Mil. lbs.	26 Mil. lbs.
Cattle in Herd	53,020 head	58,055 head
Cattle Slaughter	22,498 head	24,635 head

Crop Acres Required:

Barley	10,848	6,335
Hay/Silage	34,841	19,301
Pasture	61,354	33,591
Other	66,902	37,017
Tillable Acres	173,945	96,244
Non-tilled (range)	818,053 (f)	895,754
TOTAL ACRES	991,998	991,998

ALASKA PENINSULA (Southside)

Lands:

	(acres)	
Range	2,233,000	The range livestock system for Beef was selected to minimize conflict with wildlife, and minimize predation.
Tillable Acres	0	
Non-tillable (range)	2,233,000	
TOTAL ACRES	2,233,000	

BEEF (Extensive Range Livestock System)

Net Product (live wt.)	31 Mil. lbs.	32 Mil. lbs.
Cattle in Herd	69,037 head	71,264 head
Cattle Slaughter	29,295 head	30,240 head

Crop Acres Required:

Barley	Refer to	Refer to
Hay/Silage	South Central	South Central
Other	for Farm Prod.	for Farm Prod.
Tillable Acres	0	0
Non-tillable (range)	2,233,000	2,233,000
TOTAL ACRES	2,233,000	2,233,000

DILLINGHAM BLOCK

Lands:

	(acres)
Class 2 (c)	883,000
Class 4	138,000
Class 5	102,000
Tillable Acres	1,123,000
Non-tillable (range)	1,617,000
Non-tillable (1/4 of 1,915,000)	478,750
TOTAL ACRES	3,218,750

BEEF (Range Livestock System) (d)

Net Product (live wt.)	61 Mil. lbs.	61 Mil. lbs.
Cattle in Herd	135,829 head	135,829 head
Cattle Slaughter	57,638 head	57,638 head

Crop Acres Required:

Barley	27,791 acres	14,822 acres
Hay/Silage	89,257	45,157
Pasture	157,181	78,591
Other	171,393	86,606
Tillable Acres	455,622	225,176
Non-tillable (range)	2,095,750	2,095,750
TOTAL ACRES	2,541,372	2,320,926

BEEF (Intensive Farm System) (e)

Net Product (live wt.)	73 Mil. lbs.	188 Mil. lbs.
Cattle in Herd	140,511 head	361,136 head
Cattle Slaughter	64,389 head	165,489 head
Crop Acres Required:		
Barley	148,579 acres	203,751
Hay/Silage	165,446	216,380
Pasture	72,383	118,368
Other	241,495	336,444
Tillable Acres	627,903	874,943
Non-tilled (range)	0	0
TOTAL ACRES	627,903	874,943

INTERSTATE SHIPMENT (To supply Feed Requirements of Alaska Peninsula-Northside)

Crop Acres Required:		
Barley	24,293 acres	14,080 acres
Other	15,183	8,800
TOTAL ACRES	39,476	22,880

ALASKA PENINSULA (northside)

Lands:	(acres)
Class 5 (c)	345,000
Class 6	674,000
Tillable Acres	1,019,000
Non-tillable (range)	1,163,000
TOTAL ACRES	2,182,000

BEEF (Range Livestock System)

Net Product (live wt.)	53.3 Mil. lbs.	58 Mil. lbs.
Cattle in Herd	118,732 head	129,038 head
Cattle Slaughter	50,382 head	54,756 head
Crop Acres Required:		
Barley	See Dillingham Block	See Dillingham Block
Hay/Silage	78,022 acres	42,899 acres
Pasture	137,396	74,661
Other	134,636	73,475
Tilled Acres	350,054	191,035
Non-tilled (range)	1,831,943 (f)	1,990,962
TOTAL ACRES	2,818,997	2,818,997

- (d) Extent of range livestock system determined by available identified Range Lands.
- (e) Determined by available tillable lands.
- (f) Lands classed tillable have been allocated "Range" due to climate and use conflicts.

KUSKOKWIM RIVER BASIN

Lands:

	(acres)	
Class 2 (c)	406,000	No grazing lands were identified or included because of possible conflict with wildlife and reindeer.
Class 3	355,000	
Class 4	355,000	
Class 5	189,500	
Class 6	<u>426,000</u>	
Tillable Acres	1,731,500	
Non-tillable (range)	0	
TOTAL ACRES	1,731,500	

BEEF (Intensive Farm System)

Net Product (live wt.)	202 Mil. lbs.	373 Mil. lbs.
Cattle in Herd	387,474 head	714,682 head
Cattle Slaughter	177,559 head	327,500 head

Crop Acres Required:

Barley	409,719 acres	403,221 acres
Hay/Silage	456,232	428,212
Pasture	199,602	234,249
Other	<u>665,946</u>	<u>665,818</u>
Tillable Acres	1,731,499	1,731,500
Non-tillable (range)	0	0
TOTAL ACRES	1,731,499	1,731,500

COPPER RIVER BASIN

Lands:

	(acres)
Class 1 (c)	153,000
Class 4	14,000
Class 5	15,000
Class 6	<u>104,000</u>
Tillable Acres	286,000
Non-tillable	0
TOTAL ACRES	286,000

BEEF (Range Livestock System)

Net Product (live wt.)	7.0 Mil. lbs.	8.0 Mil. lbs.
Cattle in Herd	21,251 head	23,268 head
Cattle Slaughter	6,507 head	7,125 head

Crop Acres Required:

Barley	3,128 acres	1,826 acres
Hay/Silage	10,045	5,565
Pasture	17,689	9,684
Other	<u>19,288</u>	<u>10,672</u>

Tilled Acres	50,150	27,747
Non-tillable (range) (f)	<u>235,850</u>	<u>258,250</u>
TOTAL ACRES	286,000	285,997

KODIAK AND ISLAND RANGES (traditional ranch areas)

Lands:

Range	<u>1,200,000</u>
Tilled Acres	0
Non-tillable (range)	1,200,000
TOTAL ACRES	1,200,000

BEEF (Extensive Range Livestock System)

Net Product (live wt.)	13 Mil. lbs.	13 Mil. lbs.
Cattle in Herd	40,248 head	40,248 head
Cattle Slaughter	12,324 head	12,324 head

Crop Acres Required:

Barley	Refer to	Refer to
Hay/Silage	South Central	South Central
Other	for Farm Prod.	for Farm Prod.
Tillable Acres	0	0
Non-tillable (range)	<u>919,630</u>	<u>920,689</u>
TOTAL ACRES	919,630	920,689

LAMB AND MUTTON (Range System)

Net Product (live wt.)	1.5 Mil. lbs.	1.5 Mil. lbs.
Wool (lbs.)	388,000	388,000
Sheep in Flock (no.)	35,288	34,288
Slaughter (no.)	13,636	13,636

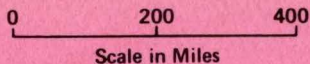
Crop Acres Required:

Barley	Refer to	Refer to
Hay/Silage	South Central	South Central
Other	for Farm Prod.	for Farm Prod.
Range	<u>280,370</u>	<u>279,311</u>
TOTAL ACRES	280,370	279,311

Previous Publications of Series:

CREATING A NORTHERN AGRICULTURE

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