

PFFRA

ANNUAL REPORT

1972/73

PRAIRIE FARM
REHABILITATION
AND RELATED
ACTIVITIES

CANADA
DEPARTMENT
OF REGIONAL
ECONOMIC
EXPANSION

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/ ANNUAL REPORT /

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INTRODUCTION

The Prairie Farm Rehabilitation Act was passed by Parliament in 1935 to assist in the reclamation of agricultural lands seriously affected by drought and soil drifting in Manitoba, Saskatchewan and Alberta. Subsequent amendments to the Act widened the scope of PFRA activities, extended indefinitely the life of the original legislation, and relaxed the PFRA boundaries to include all agricultural areas of the three prairie provinces.

Water conservation and development, and land use adjustment, have long been major concerns of PFRA; its activities have included the development of large-scale irrigation, reclamation, and community pasture operations. These activities continued during 1972-73.

In addition to operating its long-standing programs, PFRA was engaged in activities under Agricultural Service Centres Agreements negotiated with Manitoba and Saskatchewan for the improvement and/or extension of sewer and water facilities in designated centres. The cost of such projects is being shared, with Canada contributing half the cost and providing the balance in the form of loans to the provinces. PFRA is responsible for implementation and supervision of construction of the projects.

The following is a summary of activities of the Prairie Farm Rehabilitation Administration for the year ending March 31, 1973.



LAND USE SERVICE

The Land Use Service came into being in 1937 by amendment of the Prairie Farm Rehabilitation Act to include removal of submarginal land from cereal crop production. This land was to be regrassed and otherwise developed for grazing.

PFRA is now operating 94 community pastures. One of them, the Alexis Indian Reserve pasture, went into operation in 1972. This pasture, 35 miles west of Morinville, Alberta, grazed 515 head of cattle on 4,053 acres.

During the fiscal year 1972-73, there were 2,284,690 acres of pasture in use; the acreage in two non-operating pastures raised the total to 2,431,420 acres.

PASTURE OPERATIONS

The established pastures carried 11,658 head more than in the previous year. Grass and water conditions were generally satisfactory. Some 5,796 patrons grazed 215,898 head of livestock on PFRA pastures during the year. Cows in breeding fields totalled 90,935. For breeding purposes, PFRA maintained 2,843 bulls, and rented 545 from patrons.

Grazing Fees

No changes in grazing and service fees were made in 1972. In lieu of taxes, local governments continued to receive one cent per day for each adult animal grazed. Where pastures were on Indian Reserves, one-third of grazing revenue was returned to Indian Band funds. The grazing fee schedule was:

- Cattle - 6¢ per day (including 1¢ tax levy)
- Calves - \$3 per head (of current season)
- Horses - 8¢ per day (including 1¢ tax levy)
- Colts - \$5 per head (of current season)
- Sheep - 2¢ per day (including 0.3¢ tax levy)
- Breeding Service - \$5 per cow

Minimum grazing fees per head per season: cattle \$5, horses \$7.

Haying

Hay harvested on pastures and irrigation projects associated with the pasture program amounted to 5,017 tons. This hay is used for feeding PFRA bulls maintained at the pastures over winter.

Pasture Construction

Approximately 46 miles of fence was constructed and 107 miles repaired. There are now 6,335 miles of fence surrounding and dividing PFRA pastures. Fourteen buildings and structures were built and 40 others repaired during the year.

Pasture Improvement

Water development activity consisted of the construction or enlargement of 38 dugouts, the drilling of 27 wells, the erection of one new windmill, the development of four springs, and the installation of two water control structures.

In land improvement, 4,179 acres were cleared, 8,813 acres cultivated and seeded, 4,779 acres cultivated only, and 22,304 acres sprayed for weed and brush control. Operation of irrigation projects involving 10,000 acres continued; the Souris River, Val Marie and Bitter Lake Projects were extended.

WATER DEVELOPMENT SERVICE

The Water Development service, which is made up of five divisions, provides technical, financial and material assistance in the development of land and water resources for agricultural purposes.

Technical and financial assistance is provided for individual and neighbour farm dugouts, stockwatering dams, and irrigation works. Commencing April 1, 1973, PFRA will also be involved in a well development assistance program. Broader services are provided for community water projects, frequently involving complete engineering and substantial financial assistance.

In southwest Saskatchewan, PFRA has constructed water storage facilities with the capacity to irrigate the 40,000 acres of forage crops used to supply winter feed for the large livestock population of the area. PFRA continues to maintain and operate the storage works as well as six of the irrigation projects containing 25,000 irrigated acres.

On the Bow River Project in southern Alberta, 125,000 acres of land are irrigated with water from PFRA structures. An agreement for the transfer of this project to the Province of Alberta was ratified late in the fiscal year, but it is not expected to become fully effective until late in 1973-74.

The PFRA Tree Nursery at Indian Head, Saskatchewan, produces and distributes tree seedlings and cuttings for farmstead and field shelterbelt plantings.

WATER DEVELOPMENT DIVISION

Spring runoff ranged from above average in some northerly areas to zero in portions of the south. Most storage facilities were recharged to near capacity.

Dugout construction increased by 45 per cent over last year, with the largest increase shown in Manitoba. The number of stockwatering dams showed a slight decrease, while irrigation project development paralleled the previous year. Forty-one small community projects were authorized and constructed. This represents an increase of about 50 per cent.

The following table indicates field services provided in 1972-73.

SERVICES PROVIDED BY WATER DEVELOPMENT DIVISION
Fiscal Year 1972-73 - March 31, 1973

Agency	Dugout		S.W.D.				Irrigation			Drainage			Community Projects					Meetings Attended	Other Services	Total to Date		
	Technical Investigation	Final Inspection	Technical Investigation	Survey	Plan	Final Inspection	Technical Investigation	Survey	Plan	Final Inspection	Technical Investigation	Survey	Plan	Final Inspection	Technical Investigation	Survey	Plan				Report	Final Inspection
PFRA Program	1509	1596	685	311	308	146	893	220	245	122	129	28	2	-	738	46	46	47	40	-	327	7438
Federal Request	16	-	6	-	-	-	13	1	1	2	2	1	-	-	45	1	-	1	-	-	28	117
Provincial Request	13	3	150	31	30	4	132	18	45	4	49	27	22	3	79	2	4	8	-	-	156	780
Municipal Rural-Urban	-	-	12	-	-	-	5	3	1	-	16	2	7	-	15	6	4	3	1	-	19	94
Other Individuals or Groups	5	-	-	-	-	-	6	2	-	-	17	4	4	-	3	2	-	2	-	-	33	78
TOTAL	1543	1599	853	342	338	150	1049	244	292	128	213	62	35	3	880	57	54	61	41	177	563	8507

Total Capital Expenditures on Individual Projects - \$282,708.02
Average Expenditure per project - 151.00

Total Capital Expenditures on Small Community Projects - 146,547.96
Average Expenditure per project 3,574.00

Dugout Pumping - This operation was discontinued in Saskatchewan. However, in Manitoba 32,560,000 gallons of water was pumped into 120 dugouts. It is expected that Manitoba will assume responsibility for this activity in 1973 as has been the case in Saskatchewan.

CONSTRUCTION OF LARGE WATER STORAGE PROJECTS

No large community projects were constructed by the Water Development Division due to the absence of a cost-sharing policy in this area of activity. Several feasibility investigations were carried out in anticipation of a policy being inaugurated in the new fiscal year.

TECHNICAL SERVICES TO OTHER AGENCIES

PFRA provided technical services to such organizations as Water Rights agencies, the federal Indian Affairs Department, and the Saskatchewan Family Farm Improvement Branch in relation to its farm feedlot assistance program and to the provincial jumbo dugout program.

IRRIGATION PROJECTS (Developed, operated and maintained by PFRA)

Rehabilitation, Southwest Saskatchewan

PFRA has built, and operates, 27 reservoirs for the irrigation of 40,000 acres of land in southwest Saskatchewan. Of these, 25,000 acres are in six PFRA-managed projects; the remainder are under provincial or private control. Production on PFRA projects was satisfactory, with hay remaining at approximately 51,000 tons. This was produced by 544 farmers, who report an inventory of 53,820 cattle (down about 6,600 from 1971); and 3,050 sheep (up slightly).

Land levelling continued to be a major factor in increasing production. In the past year 1,058 acres were levelled. PFRA provided technical services for this operation.

Bow River Irrigation Project

Canada purchased this project from the Canada Land and Irrigation Company in 1950. Since that time there has been extensive renovation of existing structures, and substantial new construction, to provide irrigation service to more than 125,000 acres. Nearly 95,000 acres constitute the PFRA project; 25,000 acres are in the Bow River Irrigation District; and over 5,000 acres are in the Blackfoot Indian Reserve and smaller projects along the canal. PFRA operates and maintains the diversion works at Carseland, four storage reservoirs, and the main canal system. On the Bow River Project the staff provides full project management including water distribution, land administration, and land development on the resettlement area in the Hays district. Late in the fiscal year agreement was reached for Alberta to assume responsibility for operation of the project within the next year.

The renovation and extension of the original irrigation works is virtually finished with the completion of construction of the Carseland Weir (begun in 1971) and the replacement of one of the two barrels of the East Arrow-wood Syphon.

Water for irrigation is allocated on nearly 95,000 acres of land on the Bow River Project, but not all of this area is irrigated every year. In 1972 about 72,250 acres were irrigated. Cereals and alfalfa continued to be the principal crops. Potatoes, sugar beets and peas each occupied an appreciable acreage and, including small acreages of canning crops, over 15,500 acres were in specialty crops in 1972. There are two major potato processing plants, a potato starch plant, and a large alfalfa dehydrating unit at Vauxhall; sugar beets and other vegetables are marketed in the Taber area. There were ready markets for all produce with prices generally favourable.

Livestock continues to be the major factor in stabilizing agriculture on the project and contributes considerable diversification and cash income. The cattle population on the project continued to rise, taxing available pasture to the limit.

DEMONSTRATION FARM

With the development of irrigated farms on the South Saskatchewan River Project, the Demonstration Farm undertakes to demonstrate specific enterprises associated with irrigation farming. Facilities of the farm are now being utilized by the people involved in farming in the community, as well as those engaged in research, education and industry associated with irrigated agriculture.

The enterprises on the 155-acre Demonstration Farm are intended to illustrate and evaluate cropping alternatives available to the farmers, and alternative uses for field crop production in livestock enterprises.

A drylot cow-calf project, which was initiated in 1969, is producing some useful information. This, like other pilot operations, serves to indicate some of the problems that farmers may face if they decide to undertake similar enterprises on a reasonably large scale.

A 10-acre vegetable demonstration project is being conducted on the farm by the Saskatchewan Department of Agriculture and the Horticultural Department of the University of Saskatchewan. It is providing much useful information on suitable varieties and obtainable yields of horticultural crops, but should be expanded to provide more information to farmers before they become involved in such operations at the farm level.

CONSTRUCTION, EQUIPMENT AND SERVICES DIVISION

This division provides personnel and equipment for the construction and repair of PFRA projects. In the fiscal year, the Field Construction Section completed 129 jobs with a value of \$401,548. Major activity included irrigation canal reconstruction on the Eastend Project including installation

of 44 structures; canal and bridge construction and land levelling on the Rush Lake Project; canal improvement on the Val Marie Project, together with installation of 48 structures; and painting buildings on 16 project headquarters sites.

The Moose Jaw Service Depot carried out 2,569 assignments with a value of \$673,504. Repairs to vehicles and equipment accounted for 1,118 jobs; 1,075 requests for trucking services were filled.

The safety training and fire prevention programs were continued.

TREE NURSERY

Since its establishment in 1903 by the Department of the Interior, the Nursery has supplied 372 million trees, mainly for farm plantings. Almost 4.25 million seedlings and cuttings were shipped to 6,334 planters in 1972. Eighty-five per cent of the material was planted by farmers to create farm shelterbelts. Bulk shipments of tree material designated by provincial Agricultural Representatives has improved the time and quality of deliveries and kept shipping costs to the farmers to a minimum. The demand for material exceeded Nursery production for eight of the 14 species available.

Applied research and investigations since 1954 have assisted the production program through the development of efficient herbicide treatments for weed control in six tree species; refrigerated storage to increase coniferous seedlings transplants and hardwood cuttings plants; improved storage and sowing practices for elm seed; chemical controls for several seed insects; and the resolving of some nutrition and irrigation problems affecting nursery production. Development of specialized machines has greatly assisted nursery activities since 1961.

The first Nursery field day since 1967 commemorated 70 years of service and was attended by 300 visitors, mainly farmers. Fourteen groups totalling 900 people were given conducted tours of the Nursery during the year. A display trailer illustrating Nursery functions attended 19 agricultural fairs.



ENGINEERING SERVICE

The PFRA Engineering Service is engaged in the investigation, planning, design, construction and maintenance of various works pertaining to water development, irrigation and infrastructure programs in Manitoba, Saskatchewan and Alberta. It provides technical assistance to other PFRA offices responsible for the operation and maintenance of projects in which the federal government retains an interest, and to several outside agencies engaged in planning and implementing major works in large river basin developments of interprovincial or international scope. These agencies include the International Joint Commission, the Canadian International Development Agency, the Prairie Provinces Water Board, and the Saskatchewan-Nelson Basin Board.

Specialized engineering units are maintained to provide basic services in the fields of hydrology, design, geology and air surveys, soil mechanics and materials, construction, planning and investigation.

Project offices are located at Lethbridge and Cutbank, to operate and maintain the St. Mary Irrigation Project and the South Saskatchewan River Project respectively. Three regional offices are established at Winnipeg, Regina and Calgary, and a regional sub-office at Swift Current. The Soil Mechanics and Materials Division is located on the University of Saskatchewan Campus at Saskatoon.

While the project offices supervise construction, maintenance and operation of the works of large projects, the regional offices direct the field investigations, and construction of projects ranging from small water development projects up to the larger community water storage works involving provincial participation. The technical divisions do the detailed planning, designing and other engineering work necessary for implementing projects.

MAJOR PROJECTS

South Saskatchewan River Project

The two main structures on this project are the Gardiner and Qu'Appelle River Dams. Gardiner Dam is the largest earthfill dam in Canada, and is situated

midway between the towns of Outlook and Elbow. The two dams create an 8,000,000 acre-foot capacity reservoir that provides water for irrigation, power production, and for industrial, domestic and recreational uses. The cost of construction was approximately \$120,000,000 of which Canada paid \$95,000,000 and Saskatchewan \$25,000,000.

Under a 1958 federal-provincial agreement, Canada was responsible for the planning, design and construction of the works necessary to create the reservoir, and continues to be responsible for the maintenance of the structures. Making the most efficient use of the water, through development of the appropriate works, is a provincial responsibility.

During 1972-73, PFRA continued observations to assess the performance of the structures and carried out maintenance of the works and property as required. In support of the Department of the Environment, observations on piezometers in the Riverhurst area were regularly obtained. Temperature surveys were conducted for an evaporation study by the Prairie Hydrometeorological Office. Engineering services for a portion of the South Saskatchewan River Irrigation Project, including the west side pumping plant and some services in connection with the Conquest Reservoir, were provided on behalf of the provincial governments.

St. Mary Irrigation Project

The St. Mary Irrigation Project involves the planning and construction of works to irrigate nearly 500,000 acres in the Lethbridge-Medicine Hat area of southern Alberta.

Construction of headwater storage works began in 1946; the construction of all of these works and inter-connecting canals has been completed. Distribution works to serve 304,000 acres have been constructed.

The total capital expenditures by the governments involved in the project from 1946 to date are approximately:

Government of Canada (PFRA)	\$23,434,000
Province of Alberta	\$22,467,000

Engineering field staff was employed for the entire year on reconstruction of Carseland Dam on the Bow River Project. Canal wasteway, bridge, and other renovation work on the St. Mary Project was carried out, together with routine maintenance.

REGIONAL OFFICES

The Regional Offices of the Engineering Service at Winnipeg, Regina, and Calgary, and the sub-office located at Swift Current, carried out a diversity of engineering functions including field surveys and investigations, office design and cost studies, construction supervision and writing of preliminary or construction reports for a variety of projects during the year. In addition, the Regional Offices provided planning and supervision for repairs

or renovations to existing projects. Engineering assistance was rendered to other divisions of PFRA, to the Department of Regional Economic Expansion, the Prairie Provinces Water Board, and the Department of Transport. Pertinent activities are summarized below.

Manitoba

No flooding occurred on the Assiniboine River this year. Weed spraying was the only maintenance required on dikes.

The Pleasant Valley reservoir was cleared of previously cut trees. New design and cost estimates were prepared for McEachern Dam. Extensive office studies were conducted on the hydrology of streams on the Manitoba escarpment. Minor surveys and office studies were conducted on a number of small projects. A study of alternative sources of water for the town of Dauphin, which began in 1969, was continued in an effort to determine the most feasible solution to meet the municipal demand to the year 2,000. This work is continuing under the provisions of the Agricultural Service Centres Agreement with Manitoba.

Also under a federal-provincial agreement the Manitoba Regional Office supervised construction of water and sewage facilities at Brandon. PFRA is financing this \$2.4 million project, half through grants and half through loans to Manitoba. The three-year project was well advanced by year-end, and is scheduled for completion in the 1973-74 fiscal year.

PFRA continued its construction and supervisory role in the installation of sewer and water facilities and construction of roads and drains on The Pas Indian Reserve. These projects were virtually completed by the end of the year except for a road paving program to be undertaken in the ensuing year.

A study of the Roseau River, including extensive field surveys and office studies, was conducted for the International Joint Commission. In addition, topographic survey work was carried out on the Pequis Indian Reserve.

Maintenance and repair activity was continued on the Shellmouth Dam.

Saskatchewan

Surveys on four existing reservoirs were conducted to obtain up-to-date information on flooded area and capacity. There were five appraisals of existing projects, three surveys for proposed projects, two surveys for experimental spray-freeze projects for the Saskatchewan Research Council, and eight miscellaneous surveys.

Under the Agricultural Service Centres Agreement, field surveys were carried out in connection with infrastructure for the communities of Assiniboia, Hudson Bay and Prince Albert.

Repair and renovation work of a diverse nature was carried out at 10 projects.

Engineering supervision for operation, maintenance, and repair work continued on PFRA operated irrigation projects in southwest Saskatchewan, and included survey, design and construction supervision for land-levelling and canal reconstruction on these projects. Some 900 acres of land were levelled; 33 miles of field supply canals and 15 miles of field drain canals were surveyed; 99 small irrigation structures and 1,760 feet of culvert were installed; and several miles of main canal and laterals were rebuilt.

Engineering services were continued in the operation and improvement of facilities at the PFRA Tree Nursery, as were operations associated with the control and distribution of water in the Qu'Appelle Valley.

Alberta

One hundred and ninety-five plans for water storage and irrigation projects were reviewed. Eighteen of these structures were inspected. Inspections and test installation readings at both Lake McGregor Dams were continued in order to assess the effects of high water levels resulting from the construction of the new Carseland Dam.

Surveys were made on the Bow River Project main canal for the proposed replacement of Wasteway No. 1 and Deadhorse Coulee check.

Historical reports on the East and West Arrowwood Syphons and on a hydraulic assessment of the Bow River Project main canal were submitted. An economic assessment of alternative methods of replacing the Expanse Coulee Syphon was also made.

Studies were carried out for design of replacement equipment at the Smoke Creek Storage Project, and a water control gate at the Dodgson Project. Water supply studies were carried out at Hanna, Bullpound Creek and on the Hanalba proposal.

Repair work on the Travers Reservoir, Huber Project, Severn Creek Project and the East Arrowwood Syphon was supervised. Technical assistance was supplied to the Water Development Service on the Granum Project.

A cost breakdown of component reservoirs and interconnecting canal sections for the Vermilion Diversion was made and a report submitted to the Saskatchewan-Nelson Basin Board. Project summaries prepared by the SNBB for Ford, Kelsey, Drayton, Three Rivers, Saunders, Ferintosh, Parkland and Moose Portage Dams were reviewed.

Reports on infrastructure proposals at Slave Lake and High Prairie were reviewed with comments and recommendations being forwarded to the Federal-Provincial Liaison Committee. Plans for additional diking along the Northern Alberta Railway were prepared.

Reports on thermal studies in Alberta and on the Parlby Creek precipitation and streamflow study were completed and submitted. Snow measurements were continued at Hanna, Westlock and Peace River Districts and at Parlby Creek.

Additional study areas were established in the Vegreville, Fort Macleod and Calgary areas and the 1972 snow survey study report submitted.

TECHNICAL DIVISIONS

Design

Final river closure operations for Carseland Dam were investigated and implemented. Approval was given the contractor for fabrication and installation of the gates and hoists for the headgate and sluiceway structures. Construction operations of the dam were monitored and considerable follow-up design work performed. A contract was awarded for the supply of materials for construction of a cattle underpass.

Contract drawings and specifications were prepared and a contract awarded for the renovations to the 8½-foot pipe of the East Arrowwood Syphon.

Construction drawings and specifications were prepared for repairs and modifications to the outlet structure of the North Ridge Dam. Drawings for repairs to the inlet to Travers Reservoir and for construction of the Chin Coulee Syphon were prepared.

Work proceeded on final designs for Deadhorse Coulee drop structure, Wasteway #1 and the design portion of the Design and Construction Report on the South Saskatchewan River Project.

A study of the condition and structural adequacy of the St. Mary spillway drainage system, floor slab and joints was carried out.

In accordance with an agreement between Canada and the provinces for development of Agricultural Service Centres, drawings and specifications were reviewed and final contract documents prepared for five contracts to construct additions to water, sewer and storm drainage systems at Brandon, and one contract for a treated water storage reservoir for Swift Current. Investigations were undertaken on required improvements to town water supplies for Assiniboia and Hudson Bay. Work commenced on a storm drainage channel layout for a proposed subdivision in Prince Albert, and the preparation of contract documents for replacement of the water supply pipeline to Dauphin in addition to other studies for enlarging the source of water for that town.

Drawings and specifications were prepared for the Saskatchewan Department of Agriculture for construction of Conquest Reservoir East Arm, Elfros Dam and Semans Community Storage Dam. Drawings and draft specifications for the supply of pumps and designs for the superstructure and pump discharge lines of the West Side Pumping Plant were completed.

Designs and drawings were prepared for modifications and repairs to Boundary Dam spillway, Cedoux spillway, Fahlman Creek rock weir and Rinfret spillway. Drawings and specifications were prepared for renovations to LaFleche spillway piers and irrigation outlet gatewell, PFRA Moose Jaw Service Depot machine

shop roof system and fire protection system, Sinfield Creek outlet structure, Sturgis main dam and emergency spillway, West Cypress Outlet - Vidora Canal emergency spillway, and channel scour protection for the Rush Lake Project.

Preliminary designs and cost estimates were undertaken for an exhaust ventilation system for Building No. 20 at Indian Head Tree Nursery, Wawota Water Storage Project, McEachern Dam, Priddis Creek Project, and the Western Irrigation District Headworks. Previous alternatives were re-examined and cost estimates updated for Brooks Aqueduct replacement, renovations to Bassano Dam, rehabilitation of Lethbridge Northern Irrigation District structures and canal, and construction of Moose Jaw Creek Storage Reservoir.

The present load-carrying capacity of the spillway bridge and embankment of Duncairn Dam was investigated.

A report on element designs and cost estimates for the Wascana Creek Flood Study was written.

Facilities of the Hydraulics Laboratory were utilized in model studies of metergate turnout structures, vertical pipe drop structures, a three-celled conduit outlet structure, rock weirs, and a model study of the final river closure at Carseland Dam. Studies were started and are continuing on the development of a weir section for the W.I.D. headworks structure.

Geology and Air Surveys Division

Geological investigations and photogrammetric mapping in connection with water resources and agricultural service centres in Saskatchewan and Manitoba were carried out during the fiscal year. In Saskatchewan, geological studies of dam sites on Little Pipestone Creek and regional studies of groundwater supplies in the vicinity of Assiniboia were undertaken; large-scale photogrammetric mapping of floodplain areas on Moose Jaw River and Wascana Creek was completed. In Manitoba, geological studies were completed on a dam site on the Roseau River; and studies for an increased water supply for Dauphin were continued, with investigations of a reservoir on Vermilion River and groundwater supplies in a buried valley south of the town and in deeply buried glacio-fluvial sands east of the town. The field mapping and inventory program of the Indian Head Tree Nursery undertaken the previous year was completed.

Large-scale air-photo mosaics and photo maps were constructed for the Water Development Service and the Land Use Service to assist in project planning and investigation; a program to map the physical environment of selected community pastures was undertaken to assist in the planning of their development and operation.

Soil Mechanics and Materials

During the fiscal year 1972-73, the Division worked on 107 engineering studies related to the investigation, design, construction, performance and maintenance of engineering works for water development. Of these, 58 were

project studies which included 20 in Alberta, 26 in Saskatchewan, and 12 in Manitoba. The project studies ranged from investigations of individual dug-outs and development of water wells to continuing development and maintenance of major projects such as the South Saskatchewan River Project, Bow River Project and St. Mary Irrigation Project. The studies also included investigation and design work for the province of Saskatchewan, for Agricultural Service Centres, and for Special Areas. In addition to the project studies, work was performed on 49 research, testing and evaluation studies. Forty-two of the engineering studies were completed and 65 were in progress or nearing completion. Forty-one reports were prepared and 45 were under preparation. This required the drafting of 390 plans and small drawings.

A total of 9,600 lineal feet of test hole drilling was carried out at 26 sites and 2,250 samples were recovered. In the main laboratory, 19,980 tests were performed on 2,780 samples of soil, bedrock, concrete, cement, aggregates and other construction materials.

Technical assistance during construction was provided at four sites, and routine performance observations were continued at 44 sites.

Hydrology

The Hydrology Division was established in 1952 to provide hydrologic information for the planning, design and operation of PFRA projects; this is still its basic responsibility. In fulfilling this function during the past year the Division completed five formal reports, six memorandum reports, and answered fifty requests for water supply flood and miscellaneous studies.

The Hydrology Division also continued to gather and analyze data connected with four International Hydrological Decade projects. These projects are designed to improve PFRA's ability to define the probability of flooding, the thermal structure of reservoirs, and the estimation of evaporation from lakes and reservoirs in the prairies. Members of the Hydrology Division also represented PFRA on the Prairie Provinces Water Board Subcommittees on Hydrology and Water Quality.

The Division provided information, through the Manitoba Regional Engineering Office, to a Task Force on the International Roseau River Engineering Board of the International Joint Commission. This information defined the probability of increased levels of flooding on the Roseau River in Canada that would result from proposed additional drainage works in the United States. The Division also prepared hydrologic studies on Wascana Creek and Shellmouth Reservoir and measured the hydrometric parameters required for closure operations at Carseland Dam.

Other activities included collating over 1,900 miscellaneous stream-flow measurements done by PFRA in past years. These measurements will be included in a 1973 publication of the Water Survey of Canada listing all miscellaneous streamflow measurements taken in Saskatchewan.

Legal Surveys Division

All surveys except one contract on the St. Mary Irrigation Project were performed by PFRA personnel. Field surveys undertaken and completed consisted of rights-of-way, subdivisions, road diversions, retracement and topography surveys in connection with Rush Lake, Val Marie and West Val Marie Irrigation Projects; Frenchville, Moose Mountain Lake, Thomson Lake and Hazlet Reservoirs; Middle Creek and Rush Lake to Reed Lake Drains. Miscellaneous surveys were performed at Altawan, Eastend, and the Swift Current main and Herbert extension canals.

Office activities consisted of plotting, drafting and processing 20 plans for registration in the Provincial Land Registration system; preparing summaries of land control requirements and related procedures for 15 surveys; approving and/or preparing 302 legal descriptions and related sketch plans and computations.

ADMINISTRATION DIVISION

The Administration Division, operating through seven sections, co-ordinates the administrative activities of PFRA, provides Headquarters' administrative services, and gives support as required to the Departmental program in Western Canada.

The General Services Section is responsible for the provision of transcribing, records management, and office services to Headquarters' offices and for centralized administrative responsibilities including accommodation, communications, data processing, Crown Assets Disposal, and related activities. Particular attention in the past year in this service-oriented section has been given to measuring production levels and costs of services provided, and assessing quality of work.

The Finance Section provides overall financial management including pre-audit, expenditure and revenue accounting reports and statements for all PFRA programs, and special services to other Departmental activities in Western Canada. It is also responsible for the preparation of the Program Forecast and the Financial Estimates of PFRA. Emphasis in the past year has been given to financial management and costing systems related to new activities, including the Agricultural Service Centres program.

The Management Services Section provides an advisory service for management at all levels. Its primary function is to study management and operational problems and to make recommendations for improvement. The main work areas are organization analysis, systems and procedures studies, feasibility studies for data processing applications, forms design and control and appraisal of requests for office equipment. During the past year 29 defined projects were completed. Nineteen have been implemented with the expectation of improved management practices and a reduction of operational costs.

The Library Section provides complete library facilities and services to all PFRA activities and gives support as required to other Departmental programs in the West. Over the year statistics showed an increased use of reference and loan services, and progress continued on special projects such as the book catalogue and Union List of Serials, and the Federal Shared Library Services program.

The Information Section provides a full range of information and technical support services. Numerous reports, brochures, news releases and related items were made available to the public during the year. Displays and exhibits were supplied to fairs and special events, and general support was given to the Departmental information program in Western Canada. The Photographic Unit, as well as providing coverage for information purposes, continued to give assistance to the technical program of PFRA through exact-scale reproduction work, hydraulic test photography, rescaling of mosaics, and other specialized photographic techniques. Particular attention was given in the past year to audio-visual productions for information and training purposes, and to the preparation of 52 one-minute radio spots on the PFRA program.

The Material Section provides a central service for requisitioning, supply depot operations and equipment inventory. The requisitioning program involved over 2,400 orders with a value in excess of \$1,800,000. The current equipment distribution records contain 11,100 items valued at approximately \$7,900,000. Significant undertakings during the year included the acceptance of purchasing services from DSS for all Regions and the introduction of an improved monitoring system for motor vehicle operations.

The Land Section is responsible for the acquisition and administrative management of lands required for the PFRA program. This includes appraising and negotiating the purchase of land, issuing permits and leases, acquiring easements, arranging land exchanges, and maintaining a land and real property inventory. In the year under review, an improved land lease system was introduced increasing revenue and decreasing administrative input. As well, continued emphasis was placed on land inventory management through computer applications. The PFRA land inventory as of March 31, 1973, is as follows:

SUMMARY OF LAND INVENTORY TO MARCH 31, 1973

	<i>Title</i>	<i>Reservation Order in Council Lease, Easement</i>	<i>Total</i>
			(acres)
I.	<u>Water Development Service</u>		
A.	<u>Water Conservation</u>		
	Manitoba	323.0	-
	Saskatchewan	11,040.5	470.3
	Alberta	107.6	198.6
		<hr/>	<hr/>
		11,471.1	668.9
			12,140.0
B.	<u>Irrigation Projects</u>		
	Southwest Saskatchewan		
	Consul	5,216.4	-
	Eastend	5,679.8	0.1
	Maple Creek	11,089.5	205.9
	Nashlyn	534.8	22.5
	Swift Current	14,395.6	90.9
	Val Marie	6,937.4	-
	West Val Marie	5,284.4	-
		<hr/>	<hr/>
		49,137.9	319.4
			49,457.3
	Alberta		
	Bow River	88,562.6	21,108.5
			109,671.1
C.	<u>Tree Nursery</u>	160.0	480.0
D.	<u>Demonstration Farm</u>	169.5	-
		<hr/>	<hr/>
		149,501.1	22,576.8
			172,077.9
II.	<u>Land Use Service</u>		
A.	<u>Community Pastures</u>		
	Manitoba	4,744.4	392,262.5
	Saskatchewan	1,236,314.7	591,228.6
	Alberta	-	19,003.0
		<hr/>	<hr/>
		1,241,059.1	1,002,494.1
			2,243,553.2

SUMMARY OF LAND INVENTORY TO MARCH 31, 1973 (cont'd)

	<i>Title</i>	<i>Reservation Order in Council Lease, Easement</i>	<i>Total (acres)</i>
<u>III. Engineering Service</u>			
A.	<u>Assiniboine River Dyking</u> 1,077.9	32.6	1,110.5
B.	<u>St. Mary River</u> 13,259.6	8,159.8	21,419.4
	<u>14,337.5</u>	<u>8,192.4</u>	<u>22,529.9</u>
<u>IV. Miscellaneous</u>			
A.	<u>Hydrometric site</u> 10.0	-	10.0
B.	<u>Service Depots</u> 28 lots 15.5	2 lots -	30 lots 15.5
C.	<u>Bow River Exchange Lands</u> 7,581.4	-	7,581.4
	<u>7,606.9</u>	<u>-</u>	<u>7,606.9</u>
<u>Summary</u>			
I	Water Development Service 149,501.1	22,576.8	172,077.9
II	Land Use Service 1,241,059.1	1,002,494.1	2,243,553.2
III	Engineering Service 14,337.5	8,192.4	22,529.9
IV	Miscellaneous 7,606.9	-	7,606.9
	<u>1,412,504.6</u>	<u>1,033,263.3</u>	<u>2,445,767.9</u>
	TOTAL		

PERSONNEL DIVISION

The Personnel Division provides personnel services to PFRA and to offices of the Department's Western Region. The organization served is composed of 25 occupational groups representing all six categories of employment, with a full-time staff of approximately 850 employees and an additional 300 man-years of casual and seasonal employment. The Division is organized under four sections: Staff Services, Staff Relations, Staffing and Classification.

Significant developments over the past year include the introduction of an improved appraisal program and the introduction of a Supervisor's Training Program. Two residential-type seminars with a total involvement of 34 employees were held during the winter. An additional 15 per cent of the employees were enrolled in various skills and professional upgrading programs and management training.

Several organizational studies were conducted in addition to a file-by-file review of all position descriptions to identify positions requiring updating of the statements of duties. Formal classification activities were carried out on approximately 10 per cent of the full-time positions.

Ten per cent of the continuing positions within PFRA required staffing action during the year. Five per cent were filled by internal competition processes and five per cent by open competition. In addition, many casual employees, in various locations, were employed to meet peak work load requirements.



APPENDIX I

WATER DEVELOPMENT PROJECTS COMPLETED AND ASSISTANCE PAID, 1935 - MARCH 31, 1973

<i>Types of Project</i>	<i>DUGOUTS</i>		<i>DAMS</i>		<i>IRRIGATION PROJECTS</i>		<i>TOTALS</i>	
	<i>Completed</i>	<i>Assistance</i>	<i>Completed</i>	<i>Assistance</i>	<i>Completed</i>	<i>Assistance</i>	<i>Completed</i>	<i>Assistance</i>
	\$		\$		\$		\$	
<u>MANITOBA</u>								
Individual	18,175	2,578,060	353	32,571	338	141,062	18,866	2,751,693
Neighbour	77	21,852	18	6,445	22	14,141	117	42,438
Small Community	37	106,319	25	134,402	2	30,583	64	271,304
Large Water	-	-	38	2,923,074	6	617,217	44	3,540,291
TOTAL	18,289	2,706,231	434	3,096,492	368	803,003	19,091	6,605,726
<u>SASKATCHEWAN</u>								
Individual	54,279	8,431,877	6,026	696,157	3,509	1,021,144	63,814	10,149,178
Neighbour	433	137,580	64	14,604	183	109,608	680	261,792
Small Community	554	891,399	224	1,162,974	73	693,241	851	2,747,614
Large Water	-	-	64	5,690,614	38	4,329,265	102	10,019,879
TOTAL	55,266	9,460,856	6,378	7,564,349	3,803	6,153,258	65,447	23,178,463
<u>ALBERTA</u>								
Individual	17,902	3,178,739	4,094	558,111	1,655	500,447	23,651	4,237,297
Neighbour	68	26,956	18	7,108	31	17,662	117	51,726
Small Community	213	549,553	131	839,371	68	752,421	412	2,141,345
Large Water	-	-	8	871,567	20	760,784	28	1,632,351
TOTAL	18,183	3,755,248	4,251	2,276,157	1,774	2,031,314	24,208	8,062,719
GRAND TOTAL	91,738	15,922,335	11,063	12,936,998	5,945	8,987,575	108,746	37,846,908

APPENDIX II

DEVELOPMENT AND OPERATION OF COMMUNITY PASTURES
UNDER PFRA, 1938 - 1973

Fiscal Year	No. of Pasture Units in Operation	Area of Land in Pastures (acres)	Total Cost of Construction of Pastures \$	Livestock Units Carried on Pastures	Acres per Unit of Livestock	Cost of Operation		Net Operating Cost per Unit of Livestock \$	Average Charge per Unit of Livestock to Farmers \$	Municipal Tax Levy Collected
						Revenue \$	Operating Costs \$			
1938-39	14	189,800	165,995	3,231	58.7	6,340	10,186	3.15	1.96	
1939-40	26	612,300	663,471	11,522	53.1	21,633	20,946	1.82	1.82	
1940-41	35	884,500	1,004,306	23,245	38.1	43,452	35,291	1.52	1.87	
1941-42	38	936,548	1,187,361	33,230	28.2	65,435	50,607	1.52	1.97	
1942-43	45	1,261,100	1,298,488	51,127	24.7	98,292	79,907	1.56	1.92	
1943-44	46	1,268,140	1,558,055	54,472	23.3	111,114	107,535	1.97	2.04	
1944-45	49	1,337,320	1,699,012	59,997	22.3	151,461	117,065	1.95	2.52	
1945-46	50	1,361,440	1,857,020	67,778	20.1	167,045	136,567	2.01	2.46	
1946-47	53	1,412,860	2,072,274	68,493	20.6	198,115	145,293	2.12	2.89	
1947-48	53	1,417,320	2,208,919	66,347	21.4	203,888	161,471	2.43	3.07	
1948-49	54	1,436,480	2,486,277	71,393	20.1	204,012	175,666	2.46	2.86	
1949-50	54	1,439,680	2,809,196	70,308	20.5	211,624	172,255	2.45	3.01	
1950-51	56	1,521,080	3,237,331	68,858	22.1	221,129	217,867	3.16	3.21	
1951-52	57	1,574,642	3,426,586	77,240	20.4	335,327	237,742	3.08	4.34	
1952-53	59	1,652,020	3,754,098	94,137	17.5	438,514	373,737	3.97	4.66	
1953-54	60	1,678,736	3,963,573	109,583	15.3	507,179	490,808	4.48	4.55	
1954-55	60	1,696,900	4,273,917	106,322	15.9	496,806	466,154	4.38	4.66	
1955-56	60	1,728,700	4,509,669	108,499	15.8	499,045	501,541	4.67	4.60	
1956-57	61	1,759,570	4,832,863	117,441	14.9	548,601	508,003	4.33	4.67	
1957-58	61	1,796,275	5,119,317	119,398	15.0	552,938	607,129	5.08	4.63	
1958-59	62	1,815,265	5,509,958	117,032	15.5	542,607	686,449	5.87	4.64	
1959-60	64	1,818,464	5,800,342	124,812	14.6	705,785	742,915	5.95	5.65	
1960-61	65	1,896,173	6,254,224	122,813	15.4	656,709	716,467	5.83	5.35	
1961-62	68	2,088,704	6,845,656	146,672	14.2	860,808	952,359	6.49	5.87	
1962-63	71	2,114,412	7,283,658	139,643	15.1	871,955	847,753	6.07	6.24	
1963-64	75	2,149,292	7,677,379	141,723	15.2	1,168,641	981,506	6.93	8.25	145,631
1964-65	83	2,318,477	8,826,041	156,978	14.8	1,460,279	1,156,912	7.37	9.30	157,768
1965-66	84	2,325,564	9,274,172	158,434	14.7	1,431,952	1,099,382	6.94	9.04	167,493
1966-67	85	2,337,113	9,965,500	154,742	15.1	1,353,112	1,215,711	7.86	8.74	147,475
1967-68	86	2,362,671	10,946,862	162,482	14.5	1,380,678	1,341,258	7.64	8.50	144,258
1968-69	88	2,382,456	11,543,616	172,629	13.8	1,570,652	1,554,688	9.01	9.10	170,000
1969-70	88	2,386,799	12,465,226	172,624	13.8	1,652,165	1,666,223	9.65	9.57	160,959
1970-71	90	2,431,784	13,469,740	182,689	13.3	1,754,194	1,900,158	10.40	9.60	162,974
1971-72	93	2,430,940	14,227,399	205,611	11.8	1,954,604	2,002,379	9.74	9.51	176,435
1972-73	94	2,431,420	14,878,288	216,708	11.2	1,912,347	2,368,818	10.93	8.82	182,378
						24,358,438	23,848,748			

APPENDIX III

MAJOR PROJECTS - IRRIGATION, RECLAMATION AND WATER STORAGE*
TO MARCH 31, 1973

<i>Name of Project</i>	<i>Location</i>	<i>Type of Project</i>	<i>Date Completed</i>	<i>Irrigated Acres</i>	<i>Storage Capacity Acre Feet</i>	<i>Costs \$</i>
MANITOBA						
Assiniboine River Dyking and Cut Off	Brandon	River Control	Not yet complete	-	-	1,692,986
Northwest Escarpment Reclamation Project - Riding Mt. Area	Dauphin	Watershed Control	1966	-	-	1,313,103
Fairford River Project	Lake Manitoba	Flood Control	1960	-	-	287,751
Saskatchewan River Reclamation - Pasquia Area	The Pas	Reclamation	1960	135,000	-	2,256,388
Shellmouth Dam and Portage Diversion	Russell	River Control	1970	-	430,000	19,173,103
Agricultural Service Centres		Water and Sewer	Not yet complete	-	-	844,186
The Pas West	The Pas	Water and Sewer	Not yet complete	-	-	464,281
ALBERTA						
Bow River	Medicine Hat	Irrigation	Not yet complete	235,000	408,862	
a) Purchase of Canada Land and Irrigation Company						2,353,517
b) Development and Construction						29,192,813
St. Mary	Lethbridge	Irrigation	Not yet complete	510,000	320,000	25,141,102
Sawridge Creek	Slave Lake	Flood Control	Not yet complete	-	-	247,498
BRITISH COLUMBIA						
Cawston Benches	Keremeos	Irrigation (pump)	1951	629	2,000	185,491
Chase & Johnston - Western Canada Ranching	Kamloops	Irrigation	1951	755	-	98,243
Western Canada Ranching (No. 2)	Kamloops	Irrigation (pump)	1950	54	-	58,069
Lillooet - Pemberton	Pemberton	River Control	1953	-	-	1,056,539
South Thompson-Niskonlith Gravity Project	Kamloops	Irrigation	1951	1,030	1,200	12,282
Westbank Project	Kelowna	Irrigation	1950	1,200	2,500	537,450
Bankhead Irrigation Project	Kelowna	Irrigation	1951	92	-	32,229
Penticton West Bench	Penticton	Irrigation (pump)	1953	800	-	66,362
B.C. Fruitlands	Kamloops	Irrigation	1966	2,000	-	200,000
SASKATCHEWAN						
South Saskatchewan River Project	Outlook	Multi-purpose	1969	312,650	7,591,000	120,101,374
					(Including 24,000 in Qu'Appelle extension)	
Buffalo Pound Project	Qu'Appelle Valley	Urban Water Supply	1960	-	42,000	2,293,145
-Eyebrow Lake Diversion	Eyebrow	Water Supply	1960	-	-	98,376
Agricultural Service Centres		Water & Sewer	Not yet complete			221,977

(Above includes ONLY Construction Costs)

* Funds for certain of these projects were provided by special votes of parliament.

APPENDIX IV

PFRA EXPENDITURES BY ACTIVITIES, 1935 - 1973

ADMINISTRATION

Regina Administration \$ 10,525,761

LAND USE SERVICE

Cultural Work - Soil Drifting, etc. (Exp. Farm Service) 4,966,394
Community Pastures - Construction, Operation and Maintenance 53,317,433
Movement of Settlers 227,841

WATER DEVELOPMENT SERVICE

Supervision, Individual Dugouts, Wells, Community Large Water Storage and
Irrigation Projects 72,282,820
Equipment - Purchase and Repairs, Service Depot 19,491,868
Tree Nursery Stations 5,977,353
Bow River Irrigation Project 46,168,400

ENGINEERING SERVICE

Surveys, Design, Soil Mechanics, Drainage Studies, Legal Surveys, Supervision
of Construction 50,742,393
St. Mary Irrigation Project 33,519,458
South Saskatchewan River Project 137,322,052
Assiniboine River Dyking 1,694,984
Shellmouth Dam and Portage Diversion 19,173,103
B.C. Reclamation and Development, including Lillooet Project 3,310,182
Land Protection and Reclamation, Manitoba and Eastern Canada 4,136,021
Miscellaneous Projects - Construction 4,976,157

REVENUE:

Community Pasture Operations 24,358,438
Irrigation Project Operation and General Revenue 19,319,450

\$ 43,677,888

