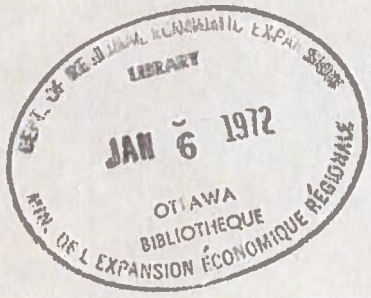
PFRA

ANNUAL REPORT

1970 / 1971



PRAIRIE FARM REHABILITATION AND RELATED ACTIVITIES

CANADA DEPARTMENT OF REGIONAL ECONOMIC EXPANSION

ANNUAL REPORT

ON THE PRAIRIE FARM REHABILITATION ADMINISTRATION of Canada.

1970-1971

DEPARTMENT OF REGIONAL ECONOMIC EXPANSION

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INTRODUCTION

The Prairie Farm Rehabilitation Act was passed by Parliament in 1935 to assist in the rehabilitation of agricultural lands seriously affected by drought and soil drifting in Manitoba, Saskatchewan and Alberta. The original legislation limited the term of the Act to four years. In 1937 amendments to the Act provided for land use adjustment and resettlement to be included in the scope of PFRA activities. In 1939 the Act was extended for an indefinite period.

Water conservation on individual farms and land use adjustment have historically been major activities of PFRA and remain as important considerations. However, the program has been extended to accommodate development of large-scale irrigation, reclamation, and community pasture operations.

In 1961, PFRA's sphere of influence was extended, enabling services to be made available to all agricultural areas of the three Prairie provinces. Production and distribution of tree seedlings for farm and government plantings became a responsibility of PFRA in 1963 when the Research Branch of the Canada Department of Agriculture was relieved of this operation.

While it had been a branch of the Department of Agriculture since its inception, PFRA was transferred in 1968 to the Department of Forestry and Rural Development, and subsequently to the Department of Regional Economic Expansion upon that department's establishment on April 1, 1969.

The following is a summary of activities of the Prairie Farm Rehabilitation Administration for the year ending March 31, 1971.

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.

In this regard, PFRA is now operating 90 community pastures, of which two went into operation in 1970. These were the White Bear Indian Reserve pasture six miles north of Carlyle, Saskatchewan, which pastures 1,223 head of cattle on its 7,880 acres and the Touchwood Indian Reserve pasture four miles south of Punnichy, Saskatchewan, which handled 1,160 head on 15,730 acres.

The acreage in operating pastures in fiscal 1970-71 was 2,258,636, and the acreage in two non-operating pastures raised the total acreage of all PFRA pastures to 2,431,784. Four new Indian Reserve pastures were also under construction.

PASTURE OPERATIONS

Regrassing and water development activities enabled the established pastures to carry an additional 7,869 head over the previous year. Grass and water conditions were generally satisfactory. Some 5,549 patrons grazed 182,700 cattle on PFRA pastures during the year.

Grazing Fees

No changes in grazing and service fees were made in 1970. Local governments continued to receive one cent per head per day for each adult animal grazed in lieu of taxes, while in the case of pastures on Indian Reserves, 1/3 of grazing revenue was returned to Indian Band funds. The grazing fee scheduled was as follows:

Cattle - 6¢ per day (including 1¢ tax levy)
Calves - $3 per season (sucking with dam, born before August 1)
Horses - 8¢ per day (including 1¢ tax levy)
Colts - $5 per season (sucking with dam, born before August 1)
Sheep - 2¢ per day (lambs - no charge)
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 5,532 tons. This hay is used for feeding PFRA bulls maintained at the pastures over winter.

Fires and Fire Protection

PFRA crews maintained 945 miles of fireguard in 24 pastures. No fires of any significance occurred during the year.

Pasture Construction

Approximately 196 miles of fence were constructed and 71 miles repaired. There are now 6,175 miles of fence surrounding and dividing PFRA pastures. Twenty-one buildings and structures were built and 18 others repaired.

Four new Indian Reserve pastures were under construction and scheduled to receive livestock in 1971. They are Bushe Pasture at High Level, Alberta; Alexander Pasture west of Morinville, Alberta; Alexis Pasture 18 miles west of Alexander Pasture; and Thunderchild Pasture north of Turtleford, Saskatchewan.

Pasture Improvement

Water development activity consisted of construction or enlargement of 67 dugouts, drilling 19 wells, construction of two dams, and installation of 21 water control structures.

In land improvement, 6,166 acres were cleared, 18,367 acres cultivated and seeded, 1,315 acres cultivated only, and 47,536 acres sprayed for weed and brush control. The Pasture Improvement section continued to operate irrigation projects involving 10,000 acres.

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 neighbourhood farm dugouts, stockwatering dams and irrigation works. In the case of community water projects, broader services are provided, frequently involving complete engineering and substantial financing.

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

In southwest Saskatchewan, PFRA has constructed water storage facilities with sufficient capacity to enable irrigation of 40,000 acres of forage crops used for 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.

On the Bow River Project in southern Alberta, 120,000 acres of land are irrigated with water from PFRA structures.

WATER DEVELOPMENT DIVISION

Normal winter snowfall resulted in normal runoff in the spring of 1970. Most storage facilities were filled, and little significant flooding occurred.

Dugout construction paralleled that of the previous year in Manitoba and Saskatchewan, with an increase shown in Alberta. The number of stockwatering dams and irrigation projects showed a slight decrease. Thirty-seven small community projects were authorized and constructed.

The following table indicates field services provided in 1970-71.

Type of Project	*Technical Investigations*	*Final Inspections*	*Completed Surveys*	*Plans Prepared*	*Total Services*
Dugouts	949	864	-	-	1,813
S.W.D.'s	862	166	311	237	1,576
Irrigation	1,391	132	316	246	2,085
Community	1,186	31	51	54	1,322
TOTAL	4,388	1,193	678	537	6,796

Total expenditures on individual projects - $196,114.85

Total expenditures on small community projects - $222,288.00

Dugout Pumping - This operation was continued with 182 farmers paying the cost of having water from two or more dugouts consolidated in one dugout where the combined volumes would be sufficient for winter needs even with thick ice on the dugout. A total of 75,800,000 gallons of water was pumped.

CONSTRUCTION OF LARGE WATER STORAGE PROJECTS

Although no large community projects were constructed, investigations were conducted on a number of potential sites. The transfer of previously constructed projects continued, with 110 Alberta projects now transferred, and 22 others being negotiated. In Saskatchewan, 83 projects were turned over to the sponsoring agencies, with 65 remaining to be transferred. In Manitoba, all but a few have been transferred.

IRRIGATION PROJECTS (Developed, operated and maintained by PFRA)

Rehabilitation, Southwest Saskatchewan

PFRA has built and operates 25 reservoirs for the irrigation of 40,000 acres of land in southwest Saskatchewan, 25,000 acres of which are in six PFRA-assisted projects, and 15,000 acres under provincial and private control.

Production on the PFRA projects was good with 57,283 tons of hay produced by 561 farmers. This is an increase of close to 6,000 tons over the previous year. This hay was used to winter feed 55,515 cattle and 3,980 sheep. The cattle population increased by about 7,500 head.

Land levelling continued to be a major factor in increasing production. In the past year, 1,296 acres were levelled, while another 1,263 acres were regraded. PFRA provided technical services for these operations.

Bow River Irrigation Project

PFRA diversion and storage facilities delivered water to irrigate 122,000 acres of land, 92,000 acres of which are in the federal Bow River Project. In addition, 17 users outside this area, three towns and one large industry were also served with water. There are 392 water users on the Bow River Project, with irrigated units averaging 221 acres. Water was available in the main canal from May 6 until mid-October.

Renovation and construction to upgrade water delivery systems was continued. More than two miles of canal bank were flattened, 19 miles of new drain constructed, 14½ miles of laterals reconstructed, and 4½ miles of laterals lined to prevent seepage. Replacement of wooden lateral structures with concrete structures continued with 29 new installations, together with 136 new concrete drainage structures. Pumps were installed in several locations to pump seepage water back into delivery systems thus reducing damage to arable areas. A wide variety of normal maintenance activities continued.

Total acreage in pasture was 8,950, with 3,100 acres of this irrigated. Specialty crops showed another large increase in acreage to 16,879 acres, up more than 3,000 acres from the previous year. The principal specialty crop was seed peas with an estimated 6,050 acres planted. There were 4,719 acres of potatoes, and 2,436 acres of sugar beets.

Demonstration Farm

Heavy demand for extension services continued at the PFRA Demonstration Farm at Outlook, Saskatchewan. Cropping and livestock practices as they pertain to the South Saskatchewan Development Area were of particular interest to agriculturalists.

A decrease in cereal crop production in the area was reflected in the decline in the number of questions asked concerning this type of production, while enquiries regarding forage crops and livestock production indicated a swing to this type of diversified agriculture.

CONSTRUCTION, EQUIPMENT AND SERVICES DIVISION

This Division provides personnel and equipment for the construction and repair of PFRA projects and in the fiscal year the Field Construction Section completed 159 jobs with a value of $616,000. Major jobs included completion of a commercial trailer court for the Department of Indian Affairs at The Pas, Manitoba; repair of control structures at Duncairn Dam; modification of the Davin-Lajord Reservoir; construction of the Middle Creek Diversion Canal; and maintenance on the Val Marie, Bedford Slough and Eastend Projects.

The Moose Jaw Service Depot carried out 2,401 assignments with a value of $547,000. Repairs to vehicles and equipment accounted for 1,116 jobs, while 894 requests for trucking services were filled.

The safety training and fire prevention programs were continued.

TREE NURSERY

More than 6¼ million tree seedlings were produced at the PFRA Indian Head Tree Nursery and shipped to 7,525 farmers and government agencies in 1970. Half of the tree material was used for planting farmstead shelterbelts, with the remainder used in planting 465 miles of field shelterbelts, 161 miles of roadside shelterbelts, and 516 tree planting programs of a community nature.

The demand for trees exceeded production for eight of the 14 species produced. Excessive precipitation during the tree packing and harvesting seasons delayed these operations. Applied investigations were continued to resolve nursery production problems related to propagation and storage, nutrition and irrigation, insects and weeds.

A display trailer contained information and exhibits on shelterbelts attended 20 agricultural fairs, and was visited by close to 20,000 people.

ENGINEERING SERVICE

The PFRA Engineering Service is engaged in investigation, planning, design and construction of various works pertaining to water development, irrigation, and infrastructure programs in Manitoba, Saskatchewan and Alberta. It also provides technical assistance to other PFRA offices responsible for the operation and maintenance of projects in which the federal government retains an interest, as well as several outside agencies engaged in planning and implementing major works in large river basin developments of inter-provincial or international scope. These agencies include the International Joint Commission, the Prairie Provinces Water Board, the Greater Winnipeg Floodway Advisory 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 and 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 provincial 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 field investigations and overall planning, and supervise construction of projects ranging in size from community water storage works to larger 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 industrial, domestic and recreational uses.

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 maintenance and operation of the structures. The cost of construction was approximately $120,000,000 with Canada paying $95,000,000 and Saskatchewan $25,000,000. Making the most efficient use of the water through development of the appropriate works is a provincial responsibility.

Test Installations and Surveys - A variety of instruments installed at the Gardiner and Qu'Appelle River Dams enables continuous assessment of performance of the structures. At both dams, observation and maintenance of the installations continued throughout the year. As a result of favourable performance of the structures and foundations, the frequency of observations was reduced.

Operation and Maintenance - Reservoir elevations were recorded twice daily. Maximum elevation was 1,826.55 feet, or within six inches of full supply level, on July 27, 1970. The lowest elevation was on March 31, 1971 when the level was 1,794.19 feet.

Discharges through the power generating plant at Gardiner Dam fluctuated hourly and varied from 2,000 to 14,500 c.f.s. At the Qu'Appelle River Dam, discharges to the Qu'Appelle River ranged from nil to 100 c.f.s.

Together with normal maintenance, there were numerous modifications, alterations and additions required. Major work involved replacement of ceramic tile on several of the control shaft panels, detailed tunnel inspections, reseeding of several areas to grass, placement of additional riprap, improvements in the spillway drainage system and radial gates, building conversion, and culvert installation.

At the Qu'Appelle River Dam, construction and modification of drainage works continued. Seeding of grass and forage crops continued on areas affected by wind erosion. More than 13,000 trees were also planted.

The Government of Saskatchewan assumed responsibility for the Cutbank construction headquarters buildings at Gardiner Dam in October, and has turned the facilities into an Indian and Métis Training Centre with DREE assistance.

St. Mary Irrigation Project

The St. Mary Irrigation Project involves works sufficient to irrigate nearly 500,000 acres in southern Alberta. Construction of headwater storage works involving the St. Mary, Belly and Waterton Rivers began in 1946. These works and inter-connecting canals are now completed. Distribution works to serve 304,000 acres have been constructed.

An agreement between Canada and Alberta provides for Canada to construct, maintain and operate the main storage and control works, while Alberta is responsible for construction and operation of the distribution system, and for settlement and agricultural development.

The province purchases water from Canada at a rate of 25¢ per acre foot or at cost, whichever is the lesser. Capital funds expended by Canada since the project began amount to $23,335,000. A portion of this is recovered through water delivery charges. Alberta's capital cost has been $22,467,000, with part of this recovered through a levy of $10 per irrigable acre for water rights on the new development.

Engineering and Construction - Topographic surveys covering 25,600 acres of potentially irrigable land were carried out in the Middle Coulee area, with some additional work done in the High Line development area. Planning and design of the distribution payout for the Skiff-Foremost tract was completed. Re-organization of the plan filing system was undertaken to accommodate a micro-filing program.

Improvement and Maintenance - Construction of an access walkway in the Waterton Dam diversion tunnel, and the acquisition of a second stop-log hoist for the St. Mary Dam spillway were the major items under project improvement. In addition to normal maintenance work, canal slope stabilization and protection continued, and major inspection and improvement work was performed on the Pinepound Syphon. Gravel was crushed under contract for use on roadways and stockpiled for future use.

Operation - Water deliveries totalled 377,520 acre-feet, the third highest demand on record. Acreages devoted to fodder, feed grains and potatoes showed substantial increases over the previous year. Other crop acreages remained fairly constant. Livestock marketings were up almost 10 per cent. The major reservoirs continued to be popular recreational areas.

Shellmouth Dam - Portage Diversion Project

An agreement between Canada and the Province of Manitoba provides for the equal sharing of costs for construction of the Shellmouth Dam and the Portage Diversion flood control and water conservation works on the Assiniboine River. Construction on the Shellmouth Project was finished during the year with completion of an 11-span reinforced concrete bridge to carry Saskatchewan Highway #369 across the reservoir. This will permit the storage of water to the full supply level in 1971-72.

Completed by the Province of Manitoba in 1969, the Portage Diversion was operated for the first time in the spring of 1970, relieving the strain on diking between Portage la Prairie and Winnipeg by carrying a portion of the peak runoff flows of the Assiniboine River into Lake Manitoba.

REGIONAL OFFICES

The Regional Offices at Winnipeg, Calgary and Regina, and a sub-office at Swift Current, conducted surveys, investigations and/or office studies on 30 projects. In addition, these offices planned and supervised repairs and renovations to many existing works, and provided engineering assistance to other DREE agencies. The offices also continued their assignments for the Saskatchewan-Nelson Basin Board. Pertinent activities are summarized below.

Manitoba

There was no flooding along the diked portion of the Assiniboine River, although flows were sufficient to cause flooding had the dikes not performed satisfactorily. A 1,000-foot stretch of badly eroded dike was rebuilt. Other maintenance work continued and willow cuttings were planted in areas susceptible to erosion.

The Winnipeg office continued to provide a full-time technician in support of the ARDA-sponsored Wilson Creek Experimental Watershed project.

Several surveys and investigations were undertaken for the Saskatchewan-Nelson Basin Board. These were performed on the Shell River, on Swan River, and on Lake Winnipegosis. Office studies were conducted on three routes for a proposed pumping scheme to divert water from Lake Winnipegosis to the upper Assiniboine River.

The Winnipeg Regional Office provided engineering services for municipal infrastructure activities at The Pas Indian Reserve townsite. Major repairs were performed at Jackson Lake Dam, while special surveys involved the Pleasant Valley and Whitewater Lake sites. Studies were conducted on Tobacco Creek, Vermilion River and Edwards Creek.

Saskatchewan

The Saskatchewan offices at Regina and Swift Current conducted surveys, prepared reports, carried out investigations and/or office studies for Avonlea, Carnduff, Craik, Dead Lake, Esterhazy, Foam Lake, Melfort, Theodore and Badgerville Dams, Lake Lenore Community Project, and the Boundary Dam spillway, as well as special surveys on the Souris River, Belanger Creek and the Moose Jaw River basin. Shoreline erosion appraisals involved the Admiral, Altawan, Braddock, Cadillac, Gouverneur, Herbert and Thomson reservoirs, while project appraisals were conducted on existing dams at Clark Creek, Coronach, Hugonard, Moose Mountain, Rinfret Creek and Roughbark Creek projects.

Major repairs and extensive maintenance involved the Davin, Duncairn, Eastend, Wolverine Creek, Maple Creek and Middle Creek projects. Opuntia Lake Dam was reconstructed. Special engineering services were provided for Coalfields Pasture.

Responsibility for engineering services for the PFRA Tree Nursery at Indian Head was continued. Several buildings were moved and altered, paving continued, modifications were made to the irrigation drainage system, and studies were conducted with a view to providing additional water.

Surveying and supervising activities for land levelling continued on irrigation projects in southwest Saskatchewan, and two principal jobs were completed. A new weir was constructed on the Richardson Diversion works, and a steel pipe syphon with reinforced concrete inlet and outlet structures was installed across the Frenchman River on the Val Marie project.

Qu'Appelle River operations saw less than 20,000 acre-feet of water released from Diefenbaker Lake. This is a decrease of more than 15,000 acre-feet from the previous year. All the water released was retained in Buffalo Pound Lake, with flow in the river and through the system of lakes obtained from Last Mountain Lake, which was well above normal level due to heavy runoff.

Work on eight components of the Saskatchewan-Nelson Basin Board was performed by the Saskatchewan Regional Office. Additional field surveys were conducted for the Churchill River Division project. On the Highgate and Callaghan Dams on the North Saskatchewan River, design and cost studies were completed and the final engineering report prepared. Two damsites were mapped and extensive foundation drilling and borrow area investigations carried out for the St. Louis Dam on the South Saskatchewan River and the Codette and Strong Pine Dams on the Saskatchewan River. Field surveys and hydrologic studies were conducted for the Clearwater Diversion to the Churchill River. Work was also carried out for the Cree Lake Diversion to the Churchill River.

Alberta

The Alberta Regional Office carried out special surveys on Kneehills Creek, Severn Creek and Lacombe Lake, performed studies related to Kettles Creek, Bigstone Creek, a large coulee near Granum, the Model Project, Beaver Mines Creek and Parlby Creek. Services to other divisions involved Sawridge Creek, the Bow River Project, and Waterton Dam.

Extensive work was carried out in support of the Saskatchewan-Nelson Basin Board involving investigations, surveys and report preparation. The sites included Hairy Hill Dam on the North Saskatchewan River, Drowningford Dam on the South Saskatchewan River, and several possible damsites between Township 44 and Edmonton. Reports were being prepared for the Bow River to Oldman River Diversion, and the North Saskatchewan to Battle to Red Deer Diversion. Reports were completed for the Lower Athabasca River to North Saskatchewan Diversion, the Moose Portage Reservoir on the Athabasca River, and the Goodwin Reservoir on the Smoky River.

TECHNICAL DIVISIONS

Design

Designs, plans and specifications were completed for a rolled earthfill dam and reinforced concrete structures on Pleasant Valley Creek. Office studies and final drawings were completed for Sawridge Creek Diversion to provide flood control for the Town of Slave Lake.

The Division prepared tender documents for a water works system, sewerage system and a road and surface drainage system at The Pas Indian Reserve.

By terms of an agreement with Saskatchewan, PFRA undertook to design and supervise construction of the west side pumping plant for the South Saskatchewan River Irrigation Project.

Office studies were conducted and designs prepared for building new structures and repairing or replacing existing works on a number of established and proposed water development projects. Plans, specifications, cost estimates and reports were prepared for the following projects: Boundary Dam, Clark Creek Dam, Duncairn Dam, East Arrowwood Syphon, Hugonard Dam, Indian Head Reservoir, Knollys Crossing, Maple Creek Diversion Weir, Opuntia Lake Project, Richardson Diversion Structure, Rinfret Dam, Roughbark Dam, St. Mary Project, Semans Water Supply Reservoir, South Saskatchewan River Project, West Arrowwood Syphon, and the Vanguard East Irrigation Project.

Work was also carried out in connection with retubing a boiler at the Moose Jaw Supply Depot, designing protective frames for tractors, and designing a pedestrian bridge across the Souris River at Coalfields Bull Station.

Office feasibility studies were conducted and work proceeded on the preparation of cost estimates and preliminary designs for structures in support of 17 Saskatchewan-Nelson Basin Board proposals for large water storage and diversion schemes.

Facilities of the Hydraulics Laboratory were employed in testing models of the Waterton irrigation outlet and the Sawridge Creek Project in Alberta.

Geology and Air Surveys

Geological investigations and reports dealing with damsites, diversion canal locations, pumping and syphon sites located in Alberta, Saskatchewan, and Manitoba were completed in support of the Saskatchewan-Nelson Basin Board program of studies.

Investigations undertaken in Alberta included the Smoky River Diversion involving the Goodwin site, a syphon crossing site on the Little Smoky River, and a diversion canal location; the Hairy Hill site on the North Saskatchewan River; the Moose Portage site on the Athabasca River, the Chisholm Mills pumpsite, the Redwater drop site, and the connecting diversion canal location; and the Bow River Diversion to Oldman River involving the Dalemead site, and the Parkland site on the Little Bow River.

In Saskatchewan, geological investigations included four sites on the Saskatchewan River system - Codette, Weldon, St. Louis and Highgate; damsites and a diversion from Clearwater River to Churchill River; and damsites and a diversion from Cree River to Churchill River.

Geological studies undertaken in Manitoba included the Rathwell pumping site on the Assiniboine River, and the Lake Winnipeg to upper Assiniboine River Diversion involving the Pelly site on Swan River, and three alternative diversion canal locations.

Large-scale maps of reservoir areas and damsites for 23 projects were prepared by photogrammetric means in connection with the Saskatchewan-Nelson Basin Board investigations. The largest among these were the Drowningford Reservoir on the South Saskatchewan River in Alberta, the Clearwater River and Cree River Diversions in Saskatchewan, and the Lake Winnipegosis-Dauphin River Diversion in Manitoba. In addition to photogrammetric mapping carried out by the Division, contracts were awarded for aerotriangulation and photogrammetric mapping in connection with water storage and diversion studies of the Dalemead Reservoir and Drowningford Reservoir in Alberta, the Saskatchewan River system involving three reservoirs in Saskatchewan, and Shell River Reservoir and Lake Winnipegosis foreshore in Manitoba.

Large-scale air photo mosaics were completed for the Water Development and Land Use services representing an area of 6,192 square miles. In addition, township mosaics covering an area of 6,480 square miles were prepared for the Saskatchewan Institute of Pedology and one large mosaic of the Qu'Appelle River drainage basin, some 20,800 square miles in area, was completed for the Saskatchewan Water Resources Branch.

Soil Mechanics and Materials

Engineering studies related to the investigation, design, construction and performance of earth dams were performed on 96 projects. These included laboratory and field testing and research programs to improve investigation and design methods for earth dams and appurtenant structures.

Reports were completed for 27 of the studies and 28 were being prepared. This required the drafting of 150 plans.

The field exploration program consisted of drilling 26,400 lineal feet of test holes and recovering 5,300 soil samples, and 1,312 feet of bedrock core. A total of 34,950 soil and concrete tests were run in the main laboratory.

Quality control testing and inspection services were provided for two projects under construction. Routine performance observations were continued on 60 dams and hydraulic structures.

Hydrology

The Division conducted 98 separate hydrological studies. Notable among these were: the effect of Lake Diefenbaker on flood frequencies at The Pas, the irrigation and riparian demands of the St. Mary irrigation system, and the terms of reference for the agricultural sector of the Prairie Provinces Water Board water demand study.

Twenty-two studies were undertaken on behalf of the Saskatchewan-Nelson Basin Board, including water supply and flood potential assessments of Cree Lake, Clearwater and Sturgeon Weir Rivers.

Instruments were installed in 11 lakes and reservoirs to obtain continuous temperature records, while on 34 lakes and reservoirs, 1,450 temperature profiles were obtained.

The section continued to provide extensive services to many federal and provincial agencies.

Legal Surveys

Field surveys were performed on West Val Marie, Val Marie, Roughbark, Bull Creek, Junction, Herbert, Manybone Creek, Battle River-Cutknife, Coalfields, Nashlyn, Duncairn and Abernethy projects.

Four contracts were issued to private firms, while PFRA personnel conducted all other surveys. Of the four contracts let for reservoir and canal surveys, one was for a small water project and three were on the Bow River.

The Division's office activities consisted of preparing and registering 14 plans in the Provincial Land Registration system, submitting 16 petitions to the Master of Titles, preparing summaries of land control requirements for various projects, and completing 58 requests for sketch plans, calculations and legal descriptions.

ADMINISTRATION DIVISION

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

The Finance Section provides overall financial management including pre-audit, expenditure and revenue accounting, and related 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 final estimates of PFRA. Over the past year, as a result of amendments to the Financial Administration Act, this Section accepted responsibility for the pre-audit function. As well, new cost reporting and revenue systems were introduced for all community pastures and internal work measurement studies were undertaken to improve the efficiency of the Section.

The General Services Section places under common management all transcribing services, registry and office services, and related central management activities. It is also responsible for managing the Shared Administrative Services program for all government departments in the Motherwell Building in Regina and for co-ordinating Branch data processing and Crown Assets Disposal programs.

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, time-study photography, rescaling of mosaics, and other specialized photographic techniques.

The Material Section provides a central service for requisitioning supply depot operations and equipment inventory. The requisitioning program involved over 2,000 orders with a value in excess of $1,500,000. The current equipment inventory consists of 11,800 items valued at approximately $7,500,000. An active program of identifying surplus and obsolete equipment continued and the information system for motor vehicle operation and utilization was improved during the year.

The Management Services Section provides an advisory service for management at all levels. Its primary function is to study management and operational problems and make recommendations for improvement. The main work areas are organization analysis, systems and procedure studies, feasibility studies for data processing applications, forms design and control, work measurement and appraisal of requests for office equipment. During the past year 18 defined projects were completed. Recommendations implemented are expected to reduce operating costs by several thousand dollars annually.

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 past year there was a significant increase in the use of reference and loan services and continued improvement in the book catalogue and Federal shared library services programs introduced in 1969-70.

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. Continued emphasis is being given to the computerization of records to assist in the management of the over 20,000 parcels of land under PFRA jurisdiction. The PFRA land inventory as of March 31, 1971, is as follows:

LAND INVENTORY TO MARCH 31, 1971

	Projects	*Owned by PFRA*	*Reserved By Order in Council, Leases, Easements, etc.* (acres)	*Total*
I	**Water Development Service**			
	A. Water Conservation			
	Manitoba	323.0	-	323.0
	Saskatchewan	10,683.0	954.4	11,637.4
	Alberta	107.6	198.6	306.2
		11,113.6	1,153.0	12,266.6
	B. Irrigation			
	Southwest Saskatchewan			
	Eastend	5,658.6	0.1	5,658.7
	Consul	5,183.1	-	5,183.1
	Maple Creek	9,108.7	245.9	9,354.6
	Nashlyn	534.8	-	534.8
	Swift Current	14,043.2	90.9	14,134.1
	Val Marie	6,937.4	-	6,937.4
	West Val Marie	5,284.4	-	5,284.4
		46,750.1	336.9	47,087.1
	Alberta			
	Bow River	89,027.7	20,927.7	109,955.4
	C. Tree Nursery	160.0	480.0	640.0
	D. Demonstration Farm	170.0	-	170.0
II	**Land Use Service**			
	A. Community Pastures			
	Manitoba	4,584.3	407,178.7	411,763.0
	Saskatchewan	1,196,209.0	604,826.4	1,801,035.4
	Alberta	-	4,850.0	4,850.0
		1,200,793.3	1,016,855.1	2,217,648.4
III	**Engineering Service**			
	A. Assiniboine Dyking	1,077.9	27.9	1,105.8
	B. Shellmouth Dam	6,135.4	2.4	6,137.8
	C. South Saskatchewan River	16,773.4	-	16,773.4
	D. St. Mary River	13,168.1	8,159.8	21,327.9
		37,154.8	8,190.1	45,344.9
IV	**Miscellaneous**			
	A. Hydrometric sites	10.0	-	10.0
	B. Service Depots	18.7	-	18.7
	C. Bow River Exchange Lands	7,915.8	-	7,915.8
		7,944.5	-	7,944.5
TOTAL		1,393,114.0	1,047,942.8	2,441,056.8

PERSONNEL DIVISION

The Personnel Division provides personnel services to PFRA and to offices of the Department's Western Region. The Division is organized under four sections which include staff services, staff relations, staffing and classification.

Significant developments over the past year in this Division include the introduction of new personnel filing codes, the development of an improved personnel information system, expanded delegation for effecting appointments and for classifying certain categories of positions, an improved procedure to process grievances and active participation in internal training and development programs.

APPENDIX I

WATER DEVELOPMENT PROJECTS COMPLETED AND ASSISTANCE PAID, 1935 - 1971

Types of Projects	DUGOUTS		DAMS		IRRIGATION PROJECTS		TOTALS	
	Completed	Assistance $	Completed	Assistance $	Completed	Assistance $	Completed	Assistance $
MANITOBA								
Individual	17825	2,532,717	352	32,271	328	135,204	18505	2,700,192
Neighbor	77	21,852	17	5,445	22	14,141	116	41,438
Small Community	25	71,089	25	134,402	2	30,583	52	236,074
Large Water	-	-	37	2,798,432	6	617,217	43	3,415,649
TOTAL	17927	2,625,658	431	2,970,550	358	797,145	18716	6,393,353
SASKATCHEWAN								
Individual	53001	8,259,069	5865	662,577	3375	968,120	62241	9,889,766
Neighbor	433	137,580	63	14,249	177	106,017	673	257,846
Small Community	535	808,343	222	1,157,877	71	688,450	828	2,654,670
Large Water	-	-	63	5,676,271	38	4,329,265	101	10,005,536
TOTAL	53969	9,204,992	6213	7,510,974	3661	6,091,852	63843	22,807,818
ALBERTA								
Individual	17061	3,058,676	3905	515,256	1589	469,672	22555	4,043,604
Neighbor	68	26,956	18	7,108	28	15,371	114	49,435
Small Community	188	480,081	130	817,196	67	727,277	385	2,024,554
Large Water	-	-	8	871,567	20	760,784	28	1,632,351
TOTAL	17317	3,565,713	4061	2,211,127	1704	1,973,104	23082	7,749,944
GRAND TOTAL	89213	15,396,363	10705	12,692,651	5723	8,862,101	105641	36,951,115

APPENDIX II

DEVELOPMENT AND OPERATION OF COMMUNITY PASTURES UNDER PFRA, 1938 - 1971

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 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	177,441	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	10,846,862	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
						20,491,487	19,477,551			1,256,558

A livestock unit indicates one head of cattle, one horse, or five sheep.

A pasture unit may include one or more pastures, but it is operated under one management.
Tax levy not included in revenue.

APPENDIX III

MAJOR PROJECTS - IRRIGATION, RECLAMATION AND WATER STORAGE

(Projects by Special Votes of Parliament, Administered by PFRA to March 31, 1971)

Name of Project	*Location*	*Type of Project*	*Date Completed*	*Irr. Ac.*	*Stor. Cap. Acre Feet*	*Costs $*
		MANITOBA				
Assiniboine River Diking & Cut Off	Brandon	River Control	Not yet complete	-	-	1,527,686
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	18,981,890
		ALBERTA				
Bow River	Medicine Hat	Irrigation	Not yet complete	235,000	408,862	54,398
a) Purchase of *Canada Land and Irrigation Company*						2,353,182
b) Development and Construction						24,353,352
St. Mary	Lethbridge	Irrigation	Not yet complete	510,000	320,000	22,373,873
Belly River Diversion	Lethbridge	Irrigation	1950	-	-	53,901
		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 (Including 24,000 in Qu'Appelle extension)	7,591,000	120,075,747
Buffalo Pound Project	Qu'Appelle Valley	Urban Water Supply	1960	-	42,000	2,293,145
- Eyebrow Lake Diversion	Eyebrow	Water Supply	1960	-	-	98,376

(Above includes ONLY Construction Costs)

APPENDIX IV

PFRA EXPENDITURES BY ACTIVITIES, 1935 - 1971

ADMINISTRATION	
Regina Administration	$ 8,511,403
LAND USE SERVICE	
Cultural Work - Soil Drifting, etc. (Exp. Farm Service)	4,966,394
Community Pastures - Construction, Operation and Maintenance	41,651,357
Movement of Settlers	227,841
WATER DEVELOPMENT SERVICE	
Supervision, Individual Dugouts, Wells, Community	66,394,079
Large Water Storage and Irrigation Projects	17,754,692
Equipment - Purchase and Repairs, Service Depot	4,590,248
Tree Nursery Stations	42,904,150
Bow River Irrigation Project	
ENGINEERING SERVICE	
Surveys, Design, Soil Mechanics, Drainage Studies, Legal	40,105,208
Surveys, Supervision of Construction	32,669,300
St. Mary Irrigation Project	136,555,650
South Saskatchewan River Project	1,690,817
Assiniboine River Dyking	19,327,346
Shellmouth Dam and Portage Diversion	3,310,182
B.C. Reclamation and Development, including Lillooet Project	4,136,021
Land Protection and Reclamation, Manitoba and Eastern Canada	5,468,041
Miscellaneous Projects - Construction	
	$430,262,729
REVENUE:	
Community Pasture Operations	21,128,764
Irrigation Project Operation and General Revenue	15,563,255
	36,692,019