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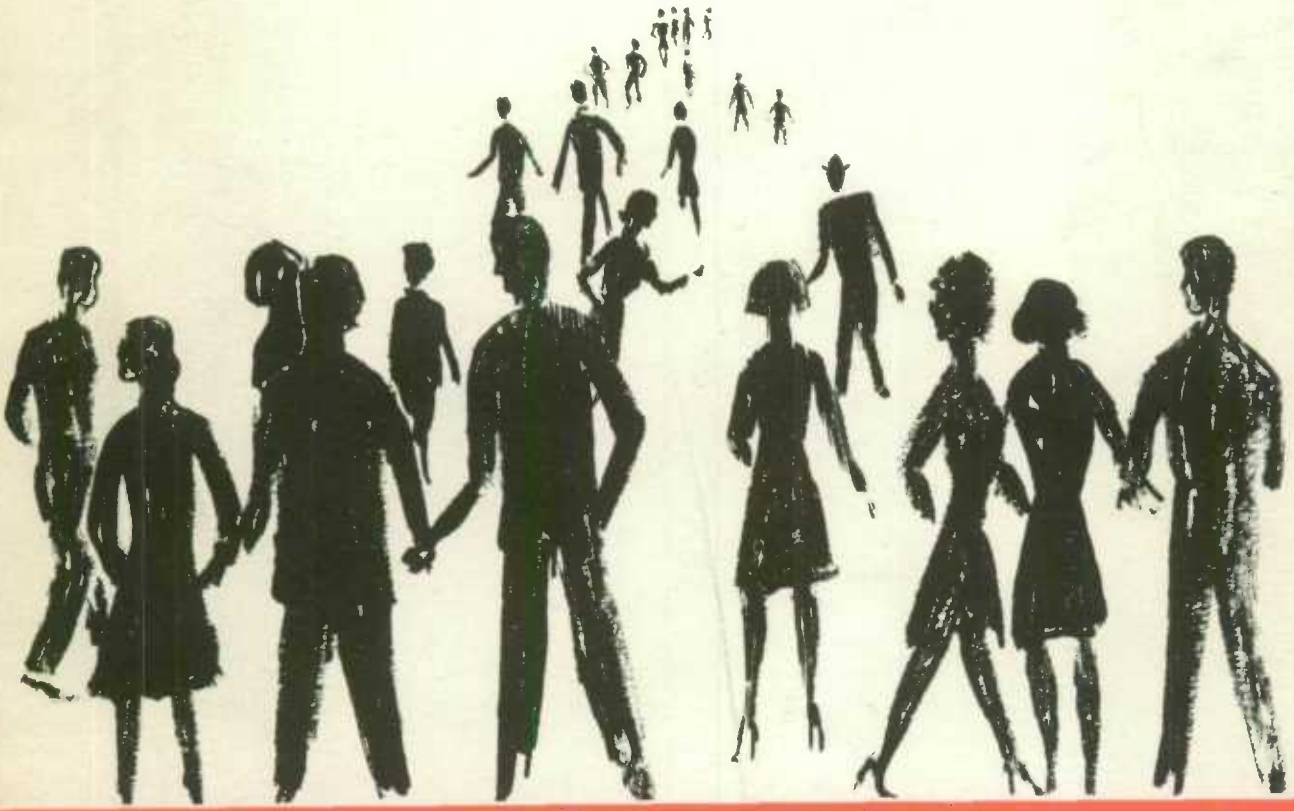

CANADIAN LABOUR FORCE SURVEY

DOMINION BUREAU OF STATISTICS
SAMPLING AND SURVEY RESEARCH STAFF

1965

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DOMINION BUREAU OF STATISTICS
Sampling and Survey Research Staff

CANADIAN LABOUR FORCE SURVEY

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PREFACE

The purpose of this report is to present a general but comprehensive description of the Canadian Labour Force Survey Design whose main function is to provide estimates of employment and unemployment in Canada and in the five regions, i.e., Atlantic, Quebec, Ontario, Prairies and British Columbia.

The report attempts to give an account of various stages of the sampling design separately although it is realized that such stages overlap and interact in a number of ways.

The detailed description of the procedures and techniques used in the design, may be found in the manual of the Labour Force Survey Design.

In addition to this report there are ten appendices, one for each province, which refer to the particular features of the Labour Force Survey in that province.

The broad objectives of the Labour Force Survey were established by Mr. W.E. Duffett, Dominion Statistician and Dr. S.A. Goldberg, Assistant Dominion Statistician. The development of mathematical and statistical techniques of the new design was the responsibility of the Sampling and Survey Research Staff. The implementation of the new design and the conduct of the survey is the responsibility of the Special Surveys Division. The determination of the overall provincial sampling ratios and general guidance in the implementation of the survey was provided by a committee consisting of I.P. Fellegi, Director, Sampling and Survey Research Staff, W.I. Moore, Director, Special Surveys Division (Chairman), R. Platek, Chief, Survey Methods Section, Sampling and Survey Research Staff, P.F. Timmons, Special Surveys Division, G.B. Gray, Chief, Sampling Research Section, Sampling and Survey Research Staff (for consultation).

The detailed technical planning, the organization of the design work and the establishment of the sampling frame were the responsibility of R. Platek and P.F. Timmons, assisted by H.V. Ashenkampf, H. Gagnon, Mrs. G. Giroux and Mrs. M. Engel.

This report has been primarily written by R. Platek assisted by P.F. Timmons, however, significant contributions have been made by I.P. Fellegi, G.B. Gray, and W.A. Nesbitt.

WALTER E. DUFFETT,

Dominion Statistician.

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For each province the following information is provided:

1. Table showing "at a glance" the Labour Force Survey Design.
2. Maps showing the distribution of selected primary sampling units under the new and old design respectively.
3. Description of Stratification.
4. Special Features.
5. Self-representing Units.

PART I

INTRODUCTION

The largest continuing field survey conducted by the Dominion Bureau of Statistics is the Canadian Labour Force Survey. The Labour Force Survey, established in 1945, was designed to provide quarterly estimates of Labour Force characteristics at the national level and for five major regions.

Since 1952 the Labour Force Survey has been conducted as a monthly survey. In one particular week every month, approximately 35,000 households throughout the country are visited by enumerators who obtain the details of Labour Force activities of all members of the household 14 years of age and over.

The knowledge of Labour Force levels, trends and various breakdowns in these data, provides an important factor in understanding and interpreting trends in the Canadian economy. Information provided by the Labour Force Survey enables the Dominion Bureau of Statistics to publish estimates on total employment, farm employment, unemployment, hours worked, the size and composition, and changes in composition of the Labour Force.

Since the introduction of the survey many improvements have been made. There have been changes in design, processing and re-enumeration to mention just a few. Many changes have also taken place in the attitude towards household surveys and area sampling methods since the Labour Force Survey began. The Labour Force Survey, at the outset, was considered to be somewhat an experimental project for obtaining information, which was hitherto unavailable, about the Labour Force of Canada as a whole. With time, the efficiency and reliability of area sampling methods have become more and more accepted and confidence in the Labour Force Survey has been widely established. Consequently, a great increase has taken place in the demand for a wider range of statistics, for regional breakdowns in addition to Canada totals, for the use of the Labour Force Survey sample frame in drawing samples for a variety of special surveys. It has become desirable, therefore, to develop the Labour Force Survey as a flexible multi-purpose sample and to improve its reliability by utilizing the knowledge derived from the analysis of the survey, by incorporating recent advances in sampling theory and the most up-to-date census information. With these objectives in mind, a complete redesign of the Labour Force Survey was undertaken in 1963 and the province of Alberta was a starting point. One of the most important features in the actual execution of the design was the mechanization of many of its operations which are described in this report.

PART II

DESIGN AND SELECTION OF SAMPLING UNITS

A. Basic Design

The Labour Force Survey is a multi-stage probability sample of the civilian, noninstitutional population of age 14 and over of Canada excluding the Northwest Territories and Yukon. The survey is comprised of two distinct parts: non-self-representing units and self-representing units.

(a) Non-self-representing Units

The non-self-representing units are the areas lying outside the self-representing units. Due to the relatively low density of population in these areas and consequently the increased distances involved in travelling, the non-self-representing units are sampled in four stages. The first stage unit is called primary sampling unit-(p.s.u.). It consists of contiguous rural enumeration areas and reasonably nearby urban areas associated with them. Its size varies from province to province depending upon the density of population, but within a province the size is fairly constant. In contrast to the self-representing areas, enumeration is conducted only in a sample of the primary sampling units. Each primary sampling unit in the sample **represents several other primary sampling units** in the population; hence the name of "non-self-representing units". Each primary sampling unit is divided into **second stage units** called **segments** which are made up of one or more **enumeration areas.** The area was assigned to a single enumerator during the 1961 Census of Canada and is the smallest area for which census data are available. Consequently, the first and the second stages of selection are made on the basis of census data, while the subsequent stages of selection are based on current field counts and listings. The selected segments are divided into **third stage units** called clusters. **Clusters** are well defined areas with boundaries identifiable on maps as well as in the field. They usually contain four or five households. Clusters are formed by sub-dividing selected segments on the basis of a current field count of households. **The fourth and the final stage unit** is of course the **household.**

(b) Self-representing Units

The self-representing units are cities whose population exceeds 15,000 persons or whose unique characteristics demand their establishment as self-representing units. All of these cities are sub-sampled directly and so each is represented in the survey by a sub-sample of its own population; hence the name "self-representing".

The larger self-representing areas are divided into **sub-units** which in turn are self-representing (i.e. directly sub-sampled). For administrative purposes, the sub-units are referred to as primary sampling units, although this is not strictly consistent with sample terminology. The sub-units are further sub-divided into **segments,** which are areas with well defined boundaries and consist normally of a city block. The segment is the first stage of selection within sub-units of self-representing units, the second and the final stage being a **household.**

The purpose of a **multi-stage sample**, as described above, is to concentrate the entire sample in a relatively few selected areas such as primary sampling units, in a few segments within selected primary sampling units etc. The effect of such concentration of sample is a reduction in the **travel cost** which would otherwise be excessive. Since each selected primary sampling unit represents several other primary sampling units, it is essential that the socio-economic characteristics of similar groups of primary sampling units not in the sample, are represented by selected primary sampling units of the same kind.

Stratification can be defined as a process of grouping similar areas with respect to some well defined characteristics, into larger areas called strata. In the Labour Force Survey strata consists of several primary sampling units (10-15), which are similar with respect to certain economic characteristics. Two primary sampling units are selected in each stratum. Stratification has three purposes:

1. It increases the accuracy of estimates by ensuring that primary sampling units are represented by similar units;
2. Selection of one or more primary sampling units from each stratum ensures that the sample is well distributed geographically throughout Canada;
3. It ensures also that sub-divisions of the population, which are themselves of special interest (i.e. provinces, economic regions, etc.), are adequately represented.

PART III

NON-SELF-REPRESENTING SAMPLING UNITS

A. Stratification

The basic stages in designing a stratified multi-stage area sample within a province were:

1. To form a number of strata having different economic characteristics;
2. To sub-divide each stratum into a number of primary sampling units of the desired size, each of which was representative of the stratum.

The first step in the stratification process was to decide on the extent of the areas within which the stratification was to be carried out (i.e. the whole country, each province separately, etc.).

Each province in Canada is divided into a number of **economic regions** as defined in the latest revision of "The Department of Defence Production Economic Regions".[1] Economic region is defined as an area of structural homogeneity according to such factors as soil characteristics, production and marketing possibilities, commercial and industrial potential. Economic regions, excluding the self-representing units, vary in size of population within a province and from province to province, the range being 60,000-250,000. **The stratification process** was carried out independently in each economic region. The following description provides a general outline of the methods used in the stratification of economic regions. A step by step account of various operations involved may be found in the **Labour Force Survey Manual.**[2]

There were two reasons for stratifying economic regions separately. Firstly, estimates may be required in the future, for areas smaller than a province, which may well be economic regions themselves or a group of them. Secondly, the economic region as a unit of stratification is more conveniently manageable than the whole province at the redesign stage as well as in future revisions of the Labour Force Survey.

The stratification process involved three design problems:

1. The choice of stratification variables with respect to which the area comprising a stratum were to be similar;
2. The choice of the number and size of strata and primary sampling units;
3. Stratification methods.

(a) Choice of Stratification Variables

A great deal of information was available from the 1961 Census which might be used as stratification variables.

The immediate problem in stratifying an economic region on the basis of census information was to select the **stratification variables** which played an important part in the region. A variable or a characteristic might be defined as "important" for stratification if it fulfilled the following conditions:

1. The characteristic was relatively stable over time. (Since the strata will be used for a number of years it is essential to maintain their internal similarity). This characteristic may be different from province to province e.g., agriculture in Saskatchewan, oil in Alberta, manufacturing in Ontario;
2. The characteristic is related to some or all major Labour Force characteristics, e.g. number of persons employed in manufacturing, heavy industry, forestry, agriculture, etc.;
3. The number of persons having this characteristic varies from area to area within the economic region (so that the concept of similar or dissimilar areas is meaningful with respect to the characteristic);
4. The number of persons having this characteristic accounts for a sizeable part of the population of the region.

Conditions 1 and 2 were taken into account in selecting characteristics from census data mostly on the basis of judgement. With respect to 3 and 4, characteristics were evaluated in a particular economic region by computing the so-called "Importance Factor"(I.F.) defined as

$$\frac{n\sigma^2}{N}$$

where n – Total number of persons in the Labour Force in a particular economic region having the particular characteristic.

N – Total number of persons in the Labour Force in a particular economic region.

σ^2 – Variance of the characteristic between municipalities in a particular economic region.

This measure was calculated for a number of characteristics in each region and the **relative size of I.F.** determined the importance of a given charac-

---

[1] Published by the D.D.P. in June 1954 under the title "Economic-Administrative Zoning of Canada including a revised version of the new D.D.P. Canadian Geographic Code", no longer available from the Department, but can be consulted in most major university or research libraries. A further description with a table showing the boundaries of the regions and their characteristics can be found in Chapter 10, "The development of a 68 region system" in "Economic Geography of Canada" by Pierre Camu, E.P. Weeks and Z.W. Sametz (Toronto, MacMillan, 1964).

[2] This manual is in the course of preparation and after printing will be available on request from Special Surveys Division, Dominion Bureau of Statistics.

teristic; the greater the relative size of I.F. the more important the characteristic. Then **three or four** of the **most important characteristics** were used for stratification purposes.

(b) Choice of the Number and Size of Strata and of Primary Sampling Units

The degree of concentration of the sample at the first stage of sampling was determined by three factors:

1. The size and the number of strata within an economic region

This was determined on the assumption that one **enumerator assignment** of 40 households per primary sampling unit would be the optimum with respect to travel cost and the spread of the sample. Since two primary sampling units were selected in each stratum, this meant a sample of 80 households per stratum. This, together with the overall **sampling ratio**, determined the stratum size in terms of its population. In general the stratum size would be given by the following relation k x 40 x R;

where k – Is the number of primary sampling units selected per stratum.

"40" – Is the number of households in one enumerator assignment.

R – Is the reciprocal of the overall sampling ratio.

In the province of Alberta, for example, where the overall sampling ratio is $\frac{1}{125}$ or 0.8%, the stratum size will be approximately 10,000 households or 40,000 persons (i.e., 2 x 40 x 125). It should be realized, however, that the **average size of stratum** varies from province to province depending on the overall sampling ratio in the province. Even within the province the stratum size is affected by the **density of population** and its characteristics. The optimum enumerator assignment of 40 households was an average, and it might be too high in low-density areas and vice versa. Given the population of a stratum and the population of an economic region (excluding the population of self-representing units within it), the number of strata, to be formed, was determined. For example, if an economic region has 180,000 persons and if it contains self-representing units amounting to 60,000 persons then three strata will be delineated

$$\left(\frac{180{,}000 - 60{,}000}{40{,}000} = 3\right).$$

2. The number of primary sampling units to be selected per stratum

Two primary sampling units were selected from each stratum and the advantages of this arrangement are as follows:

i. **Unbiased estimates of the variance** of the Labour Force estimates can be prepared;

ii. The effectiveness of stratification can be measured using the sample data and hence the **deterioration of stratification** over time can be detected;

iii. The measurement of response variance may be facilitated;

iv. Administrative convenience.

If, for some reason, enumeration cannot be completed in one of the two primary sampling units, an estimate may be obtained for the stratum using the other primary sampling unit only.

3. The total number and the size of primary sampling units per stratum

The remaining controllable factor in the degree of concentration of the sample at this stage is the number and consequently the size of primary sampling units in the stratum.

From the standpoint of **enumeration costs** primary sampling units should be as small as possible. However, in order to form primary sampling units which are **representative of the stratum,** it was necessary to include all of the characteristics of the stratum in each primary sampling unit. On the basis of a thorough analysis of the available data and previous experience, a primary sampling unit of approximately 3,000 population would appear to be the smallest area capable of fulfilling these conditions. Thus in a stratum of approximately 40,000 population there would be about 10 to 15 primary sampling units.

(c) Stratification Methods

Having determined the number and the size of strata and primary sampling units within strata, the actual delineation of strata and primary sampling units was carried out observing the following principles:

1. Cities whose population was 15,000 or more were regarded as self-representing areas;

2. The strata and the primary sampling units must satisfy the requirements of the stipulated size and contiguity;

3. A stratum must be a contiguous geographical area. The use of contiguity is suggested by the fact that adjacent areas are more alike than areas which are further apart. Moreover, they are more likely to remain alike over time, since the strata are relatively small and local developments may effect the entire stratum more or less at the same rate;

4. Variation with respect to the "discriminating characteristics" must be as high as possible between the strata formed and as low as possible within each stratum. The "discriminating characteristics" were selected on the basis of their "importance factor" and judgment (See the section on "the choice of stratification variables");

5. The proportion between urban and rural type of population of a primary sampling unit must be close to the proportion of the same type of population in the same stratum.

The units used in setting up strata are **enumeration areas.** There are approximately 32,000 enumeration areas in the country of which approximately half are outside cities with more than 15,000 population. These enumeration areas must be grouped into strata according to **socio-economic similarity** and **geographical contiguity.** Considering the repetitive character and volume of the operation involved in the stratification of these areas it was essential to have a **uniform method** which would ensure speed and efficiency.

The method used for stratification of an economic region may be described as follows:

First the "discriminating characteristics" were determined. Next the enumeration areas in the region were compared with the entire region with respect to the "discriminating characteristics" by computing the ratio

$$\frac{P_{ij}}{P_i}$$

where P_{ij} – The proportion of persons having the **ith** "discriminating characteristic" in the **jth** enumeration area

P_i – Overall proportion of persons having the **ith** characteristic in the economic region.

This ratio compared the proportion of a characteristic in an enumeration area with the overall proportion of the same characteristic in the economic region. If, for example, an enumeration area was exactly like the economic region with respect to a particular characteristic, the corresponding P_{ij} would be equal to P_i and the measure would be equal to 1. Any departure from 1 indicated the relative departure from similarity between the enumeration area and the economic region.

A **characteristic pattern** for each enumeration area was obtained by plotting the $\frac{P_{ij}}{P_i}$ for three or four "discriminating characteristics" and joining these points by straight lines. Some basic patterns were recognized and the pattern of each enumeration area was coded according to its similarity to one of the basic patterns. All the enumeration areas with the same code were grouped into a stratum as described under the operational method. Adjustments were made to observe the conditions of contiguity and size criteria. Finally the strata were plotted on the map for the economic region.

B. Delineation of Primary Sampling Units

Ideally each primary sampling unit within a given stratum should be a replica of the stratum with respect to the "discriminating characteristics". This, however, is seldom possible in practice and a **certain amount of variation** must be tolerated. In the design of the Labour Force Survey a **maximum deviation** of 5% from the stratum proportions for the "discriminating characteristics" was the objective. **The proportion of urban and rural population** in the primary sampling unit was even more strictly controlled because of its basic importance. Due to the variation in the size and geographical distribution of urban centres it was often necessary **to split urban** centres between two or more primary sampling units. The purpose of this was to maintain the required proportion of urban and rural population and to reduce the variation in the size of primary sampling units. The **splitting of urban centres** was not made geographically but on a ratio basis. If, for example, an urban centre was to be split equally among three primary sampling units, then a systematic sample of one third of the urban centre was allocated for each of the three primary sampling units, rather than one third of the area. This ensures a **better sample** while at the same time the increase in cost is not expected to be appreciable, if the urban and rural parts of a primary sampling unit are close to one another.

C. Operational Methods

The application of the stratification procedure described in the foregoing sections required speedy and accurate handling of a very large volume of data and calculation. A system was developed, therefore, to reduce as much of the organization of data as possible to **mechanical operations.** The operations consisted of:

(a) Basic Tape Record of 1961 Census Data

A tape record of selected 1961 Census data by enumeration areas was prepared through a **computer program,** and a **print-out** of the data to be used for the design of the Labour Force Survey was obtained. This print-out provided the basic data source against which checks would be made at a later stage.

(b) Punched Cards

The data from the basic tape record was slightly condensed in order to conform to the limitations imposed by the 80-column punch card. Thus, for example, forestry, fishing and trapping became one group. The condensed data was reproduced on punched cards, **one card** representing **one enumeration area.** The enumeration area punched cards were sorted into **self-representing** and **non-self-representing** decks according to the conditions described above under "basic design". Some enumeration areas comprised a single institution. These enumeration areas, referred to as **special enumeration areas,** were removed from the two decks and were treated separately.

(c) Computer Program SCT 111-112

A special computer program for non-self-representing units SCT 111-112 was developed to produce a print-out from the enumeration area punched cards, showing:

1. The number of persons and P_i, defined on page 11, for each Labour Force characteristic within each economic region;
2. The number of persons, P_{ij} and $\frac{P_{ij}}{P^i}$ defined on page 11, for each enumeration area and each municipality; (an administrative unit consisting of a group of enumeration areas);
3. σ^2 and I.F. (Importance Factor) defined on page 9, for each characteristic within each economic region by urban and rural type of area separately.

(d) Patterns

The ratio $\frac{P_{ij}}{P_i}$, for the selected "discriminating characteristics", was plotted for each enumeration area producing a **characteristic pattern.** The **degree of similarity** among the enumeration areas was demonstrated by corresponding similarity in the shape of the pattern. Similar patterns were grouped together and each group was given a **specific symbol.** Thus all the areas within a particular group were described by the specific symbol of that group. These groups represented the first attempt at stratification.

(e) Maps

A map was prepared for each economic region showing all enumeration areas, their population, the pattern symbol and any other pertinent data peculiar to the region. A **plastic overlay** was attached to the map to permit changes in boundaries to be made without damaging the basic map.

(f) Formation of Strata

A stratum is to be formed as a contiguous **geographical area** made up of smaller areas (enumeration areas and municipalities) which have similar characteristics. Using the maps from (e) all the main factors were considered when delineating the final strata. The factors, which were taken into account besides those mentioned in (e) were location, topography, special industry patterns, location and availability of roads and bridges and special conditions. Subject to the limitation of stratum size, **similar areas** were grouped together to form strata.

(g) Stratum Print-out

The enumeration area punched cards were sorted by stratum and for each stratum a print-out was obtained showing the total number of persons, the number of persons in the rural and urban part (i.e., rural and urban enumeration areas of the stratum) and the number of persons employed in various economic activities in these parts. **Percentages of all these characteristics** were calculated by stratum to form the basic standard in both rural and urban parts for the delineation of primary sampling units in that stratum.

(h) Distribution of Urban Parts

It was essential that the distribution of characteristics of each primary sampling unit, within a particular stratum, was as close as possible to that of the stratum, as given by the standard mentioned in (g). In order to ensure this, it was quite often necessary to **divide urban centres** into a number of parts allocating each part to different primary sampling units. This was accomplished by:

1. Listing all urban centres according to their geographical location within a stratum;
2. Separating out all urban centres whose population characteristics met the requirements of the urban standards of the stratum;
3. Combining or splitting the centres into as many parts as there were primary sampling units to be formed in such a way that each part met the stratum standards. These parts constituted the urban parts of primary sampling units.

When the urban part of a primary sampling unit was made up of more than one urban centre it was important to ensure that these centres were close to one another and that there were sufficient communication facilities between them.

(i) Delineation of Primary Sampling Units

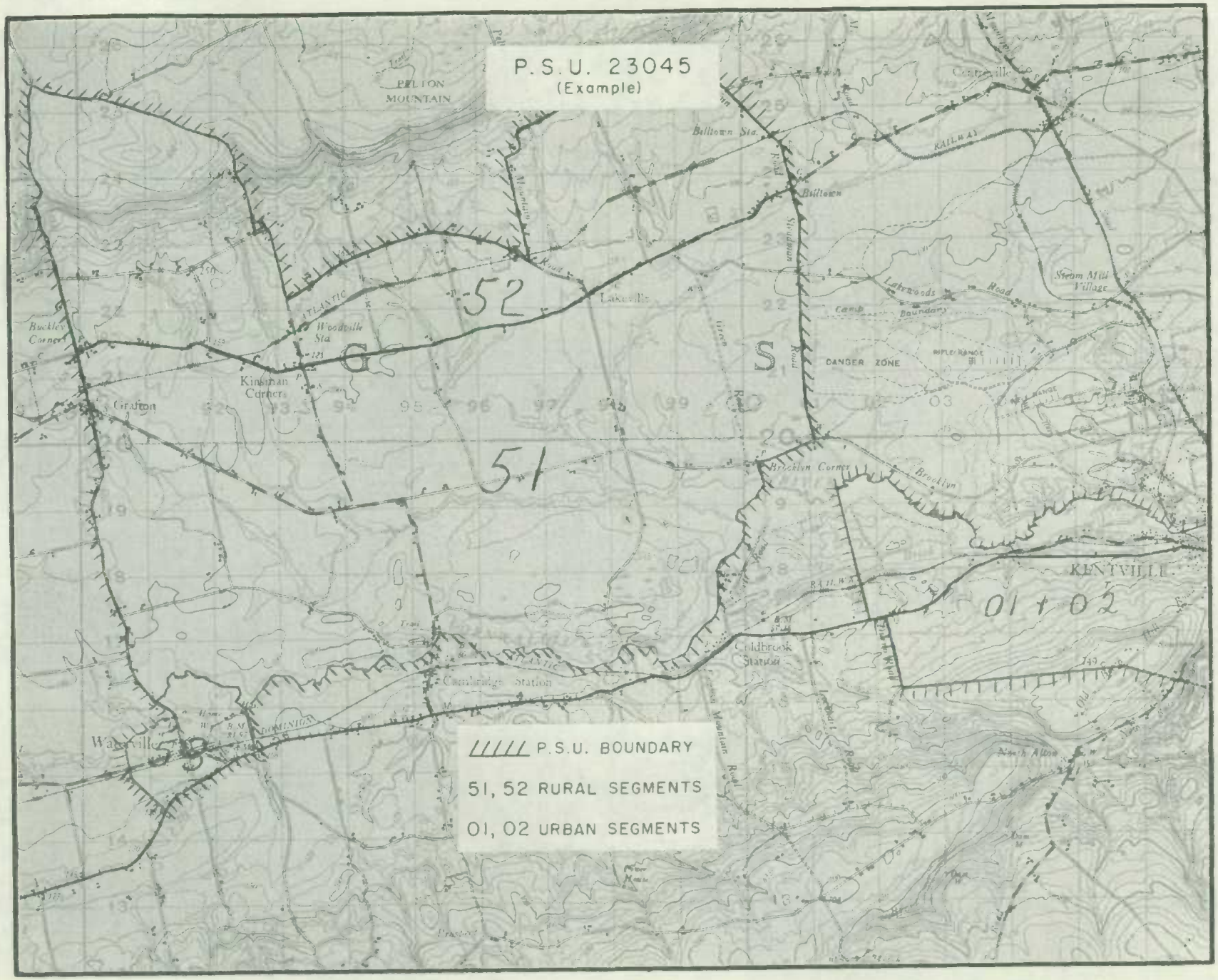
Using the maps from (e) and the standard from (g), primary sampling units were then delineated by grouping **contiguous rural enumeration** areas and associating them with the **urban parts** formed in (h). Special care was taken to minimize travel within a primary sampling unit and to form primary sampling units closely resembling the distribution of "discriminating characteristics" for the stratum. The maximum **acceptable deviation** was 5% for each discriminating characteristic. In addition the rural-urban proportion in each primary sampling unit had to be within 5% of the corresponding proportion in the stratum. Although primary sampling units within the same stratum varied in size as measured in terms of total population, this variation was not greater than 20% of the average size of primary sampling units in that stratum. It was not necessary to control the variation of the total population of primary sampling units so rigidly at this stage since it was taken care of by the sampling procedure (See section D). In some cases, however, an adjustment had to be made to correct for some excessive differences either in the size of primary sampling unit or in the proportion of some of the Labour Force characteristics. This adjustment was usually accomplished by interchanging enumeration areas from the same type of area and from the same stratum. (An example of a primary sampling unit is given on page 13).

(j) Primary Sampling Unit Record and Verification

Enumeration area punched cards were hand sorted by primary sampling units and a print-out was obtained showing:

1. For each enumeration area the characteristics entered on the punch cards;
2. The urban and rural sub-totals;
3. The totals for all characteristics for each primary sampling unit.

The purpose of this tabulation was to observe the variation, with respect to the important characteristics, between the enumeration areas in the same primary sampling unit.


P.S.U. 23045
(Example)
52
51
01 + 02
G
S
P.S.U. BOUNDARY
51, 52 RURAL SEGMENTS
01, 02 URBAN SEGMENTS

D. Selection of Sampling Units

(a) Selection of Primary Sampling Units

A computer program L.F.S. 090 was prepared to calculate the probabilities of selection for the first and second primary sampling units in each stratum. The input for this program consisted of the population of each primary sampling unit and the number of primary sampling units in a stratum.

The output of the computer program provided the probabilities for the selection of primary sampling units. In each stratum two **primary sampling units** were selected at random constituting **the first stage of selection.** In each stratum the probability of selection of each primary sampling unit was proportional to its total population. The purpose of this was to counteract the adverse effect which the variation in the size of population of primary sampling units would otherwise have on the reliability of the final estimate. Each primary sampling unit consisted of enumeration areas, and **the selected** primary sampling units were sub-divided into **segments** which are made up of one or more enumeration areas. In some cases where the enumeration area was exceptionally large it was sub-divided into two segments, assigning half of the households to each segment. Within each selected primary sampling unit a **second stage** of sampling was carried out by selecting a sample of segments.

(b) Selection of Segments

In order to select a sample of segments the **sub-sampling ratio** was calculated for each selected primary sampling unit.

The sampling ratio $\frac{1}{R}$ was defined as:

$$1:R = 1: \frac{PxSxk}{N}$$

where N – Was the 1961 Census population of the stratum (obtained from the print-out under C (g))

P – Was the 1961 Census population in the primary sampling unit (obtained from the print-out under C (j))

1/S – Was the overall sampling ratio for a province

k – Is the number of selected primary sampling units per stratum (k = 2).

The following data for each selected primary sampling unit was obtained from the primary sampling unit record described in Part III, C (j) on page 12.

1. Primary sampling unit identification number
2. Primary sampling unit population total
3. Stratum population total
4. Name of town or village, where applicable
5. Census identification
6. Number of households in each segment

The data for each selected primary sampling unit was entered on a "segment selection and rotation" form with the urban segments listed separately, one to a line, followed by the rural segments, also one to a line.

A density factor, d.f. (equals the expected household take per segment) was then calculated for the urban part and for the rural part of the primary sampling unit according to the formula

$$\text{d.f. (urban)} = \frac{Pu}{nR}$$

$$\text{d.f. (rural)} = \frac{Pr}{nR}$$

where Pu – Total number of households in the urban part of the primary sampling unit

Pr – Total number of households in the rural part of the primary sampling unit

$\frac{1}{R}$ – Primary sampling unit sampling ratio

n = 2 – Number of segments to be selected from both the urban and rural segments of the primary sampling unit.

If the density factor, d.f., was greater than 20 it was recalculated using n + 1, i.e., an additional segment was selected maintaining an expected household take for each segment of less than twenty.

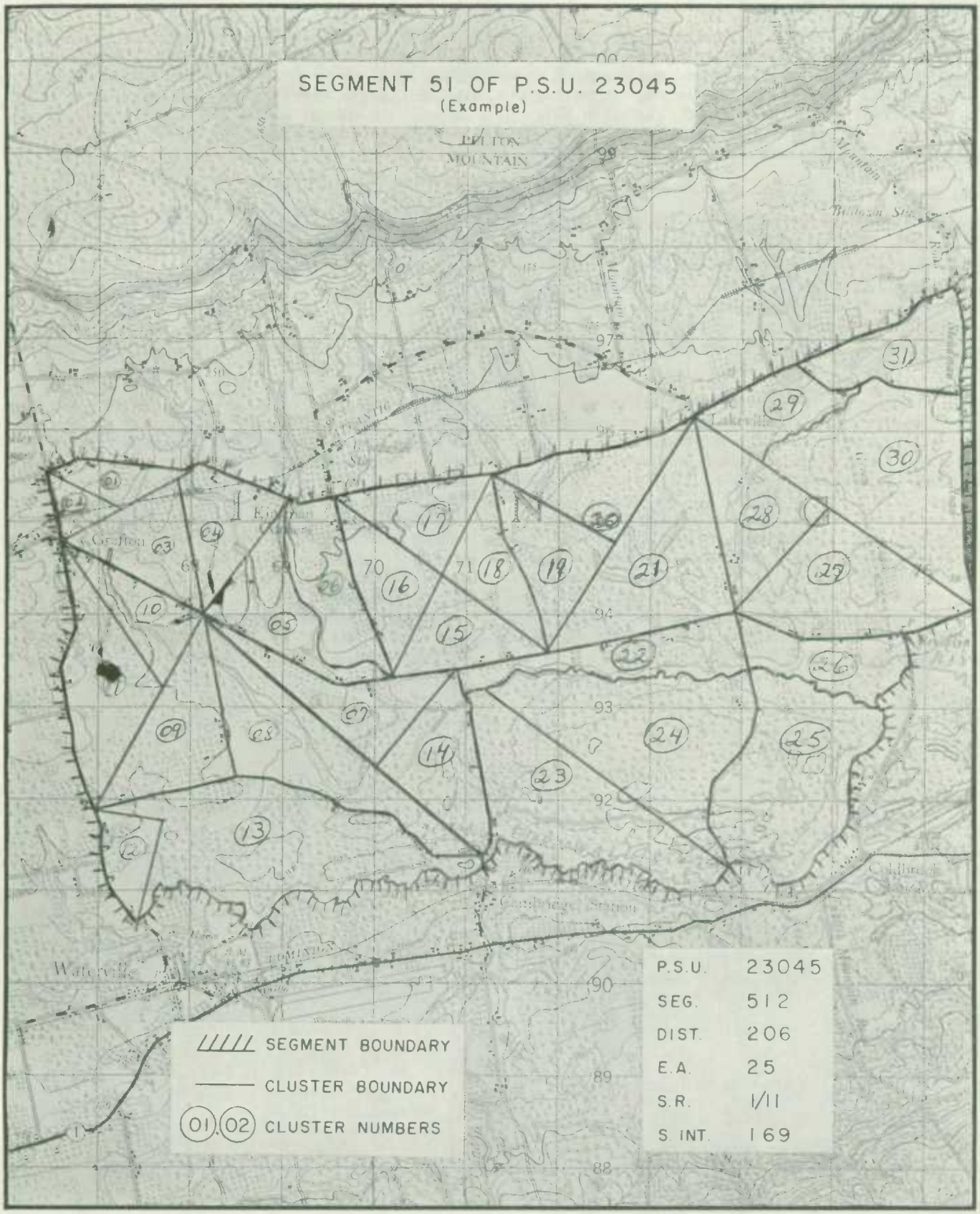
The required number of urban and rural segments were then selected systematically. The probability of selection of each segment within a primary sampling unit is proportional to the number of households contained in it. For each selected segment a segment sub-sampling ratio $\frac{1}{R_1}$ was computed using the formula

$$R_1 = \frac{P_1}{\text{d.f.}}$$

where P_1 is the number of households in the segment d.f. is the density factor as defined above.

Maps of the selected segments were prepared and forwarded to the appropriate regional office where field representatives provided a **physical count** of all dwellings within the segment. These counts are entered on the maps in such a way as to respect all permanent physical features such as roads, rivers, railroad tracks, etc.

Each selected segment was then subdivided into a number of clusters on these maps (see example); a cluster is a well defined area with boundaries recognizable both on the maps and in the field. Clusters contained four households or a multiple of four households and were consequently called **single** or **multiple clusters.**


SEGMENT 51 OF P.S.U. 23045
(Example)
PRITTON MOUNTAIN
SEGMENT BOUNDARY
CLUSTER BOUNDARY
01 02 CLUSTER NUMBERS
P.S.U. 23045
SEG. 512
DIST. 206
E.A. 25
S.R. 1/11
S. INT. 169

(c) Selection of Clusters

The third stage of sampling was carried out within the selected segments by selecting a sub-sample of clusters. The segment sub-sampling ratio computed in (b) page 14, determined the number to be selected within the segment. The probability of selection of each cluster was proportional to the number of households contained in it.

(d) Selection of Households

The fourth and the final stage of selection was carried out within the selected clusters by selecting a sample of households. Within **single clusters** all households are enumerated, while the multiple clusters are sub-sampled to yield the same number of households which were usually contained in a single cluster.

A diagram of each selected cluster was drawn on a cluster list form (see example) along with cluster identification, the sub-sampling ratio of the cluster and a random start indicating where the sample should begin. This material was sent to the appropriate regional office. All dwellings within the clusters were then listed on this form by an enumerator and a systematic sample of dwellings was selected using the cluster sampling ratio and random start shown on the form. Each of the selected dwellings was then visited by a Labour Force Survey enumerator during a specified week and all persons in the household occupying the selected dwellings were interviewed.

(e) Special Areas

Due to the special nature and the effect on the estimation of Labour Force characteristics, institutions such as hospitals, schools, hotels, military establishments, remote areas, etc. have been designated as **special areas**. The special areas have been divided, for sampling purposes, into the following groups:

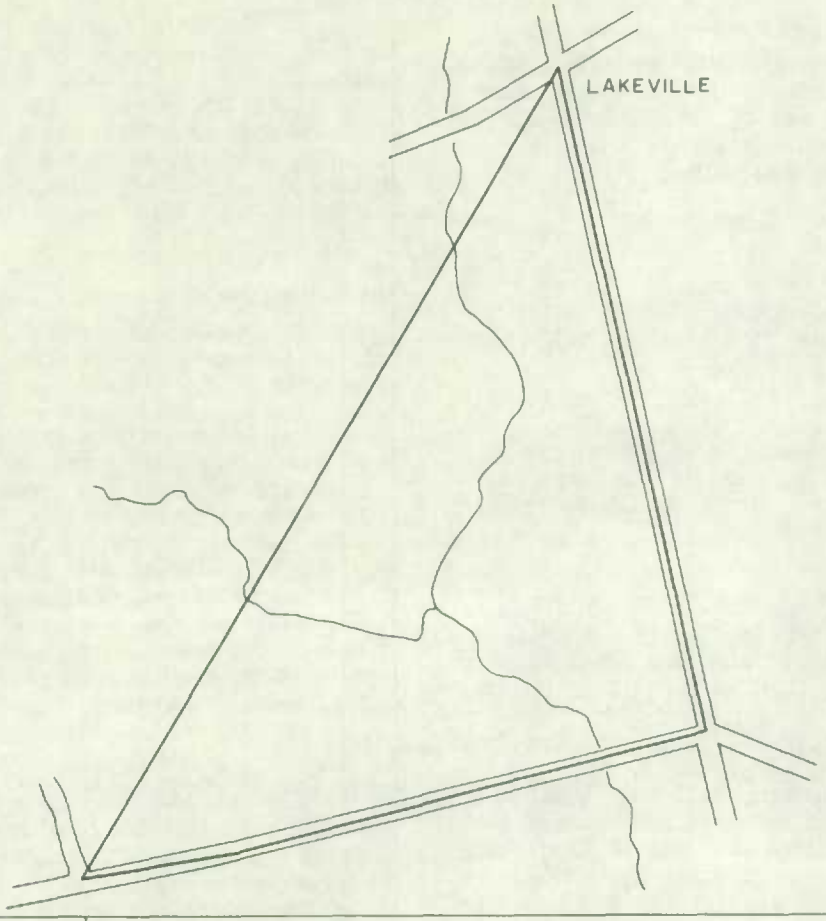
1. Military establishments;
2. Hospitals (general, mental, T.B.);
3. Remote areas;
4. Other special areas (remainder).

A special stratum consisting of the above groups was formed in each province. In order to maintain the uniformity of procedure, the special areas were organized into primary sampling units, each primary sampling unit having approximately equal representation in each of the four groups mentioned above. Two primary sampling units were selected and in each of the two primary sampling units a sub-sample was chosen representing all the four groups. The method of enumeration may vary from special area to special area depending on the peculiarity of the segment. For example in the **remote areas**, where the normal household identification barely exists a list of the heads of households in the selected segments was obtained from the 1961 Census visitation records. This list was given to the Royal Canadian Mounted Police who maintain it and enumerate the heads of households designated by the sampling ratio.

DOMINION BUREAU OF STATISTICS

LF6

CLUSTER LIST



Location of added listings	Listing No.	Address or Description	Survey In.

☐ Continued on next page

Listed by

Location

Date

Survey introduced 169

Sampling Ratio 1/11

PSU 2 3 0 4 5

SEG. 5 1 2

CL. 2 1

9604-97.I: 6-3-64

PART IV

SELF-REPRESENTING SAMPLING UNITS

A. Introduction

The self-representing units are cities whose population exceeds 15,000 persons or whose characteristics are unique and of special interest. The boundaries of the self-representing units coincide with the boundaries of metropolitan areas as defined by the 1961 Census.

In the self-representing unit, the Labour Force Survey is a **two-stage sample.** The first stage unit is **the segment** and the second stage unit is **the household.**

The problems encountered in selecting a continuing sample of households in the large cities are quite different from those encountered in the less heavily populated areas.

In the areas of lower population density (non-self-representing units) **multi-stage sampling** is used to reduce costs and **stratification** is used to reduce sampling variability. In the cities, however, enumerator travel costs and other field costs are relatively low and therefore multi-stage sampling will not reduce costs substantially. At the same time without the clustering effect of multi-stage sampling, geographical stratification becomes less important. While the twin problems of field costs and stratification assume a less important aspect in the cities, **rapid suburban growth** and **urban redevelopment** create a problem in sampling for a continuing survey. Two new features were introduced in the new design to attempt to bring these problems under control by maintaining a more up to date sample frame: a) the larger cities were **sub-divided into units** which were sampled independently and therefore can be revised separately as the need arises; b) a special sample of apartments was set up in the larger cities for apartment blocks having five or more stories, and 30 or more units, thus removing this problem area from the "regular" sample.

B. Delineation and Selection of Segments

(a) General Description

All the self-representing units whose population was sufficiently large (more than 40,000) were subdivided into **sub-units** ranging in size from 15,000 to 30,000 persons.

Within the larger cities the census has established areas called **census tracts** whose boundaries remain stable over time. Wherever possible, census tracts have been used in the formation of sub-units. For most of the census tract areas, dwelling counts by city blocks were available from 1961 Census. However, when this was not the case, dwelling counts by city blocks were obtained from the regional office. These counts were necessary for the delineation of segments which usually consisted of one or more city blocks. As an example, a map showing sub-units for the city of Halifax is on page 19. The sub-units are numbered from 1 to 15.

(b) Delineation of Segments

Each sub-unit was divided into segments whose delineation was in accordance with the following criteria:

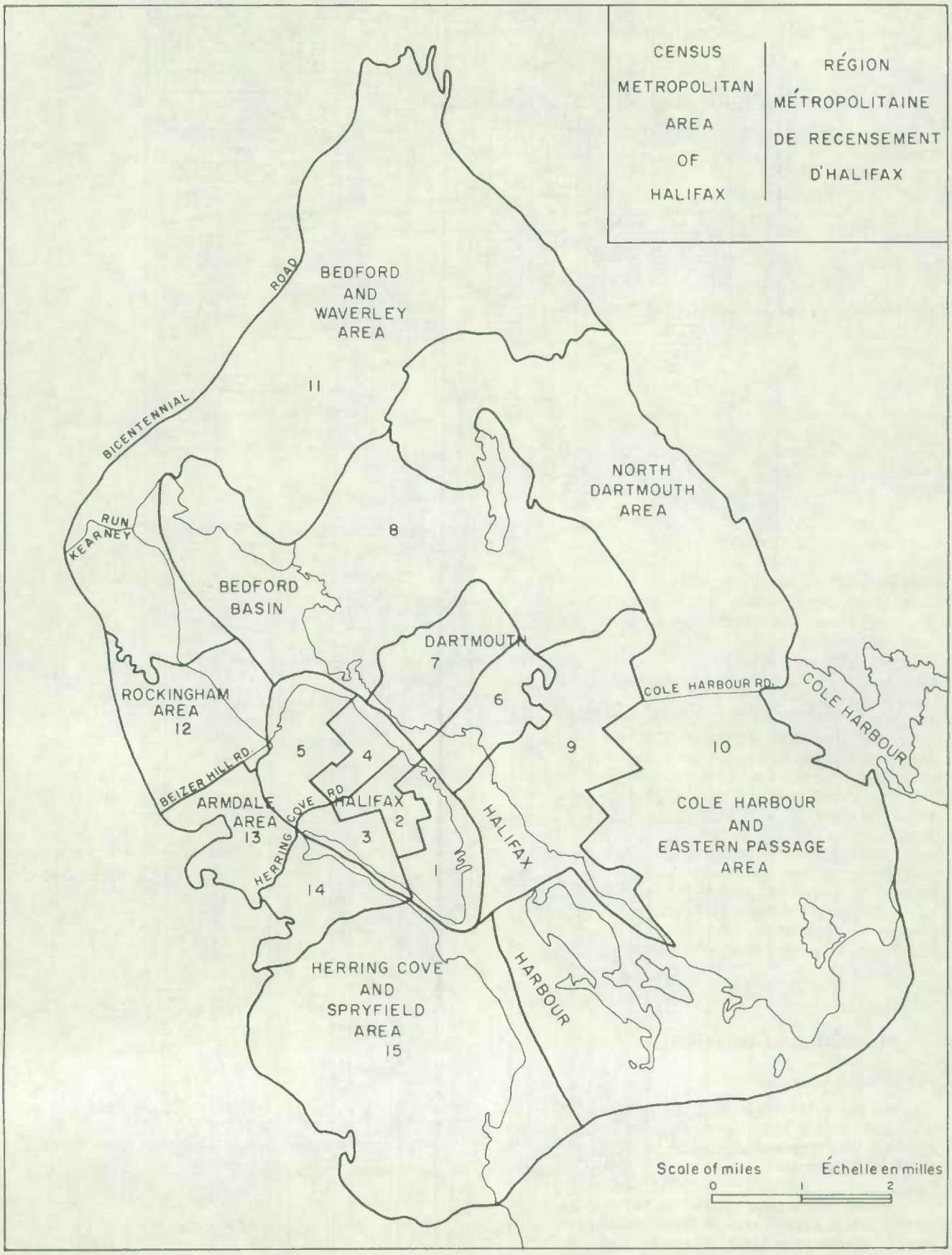
1. If a city block had less than a specified number of households (determined by the density factor see section C) it was **combined** with another block to form a segment;

2. The whole area of the sub-unit had to be **accounted for.** Areas containing no dwellings and apparently no space for residential construction, (e.g. parks, industrial plants, etc.), were joined with other contiguous areas to form segments conforming to 1 above.

The segments formed in this way were outlined on the maps and were serially numbered. They were listed in numerical order on segment record forms showing the number of dwellings in each segment. The completed segment record forms provided the frame from which the sample of segments for the Labour Force Survey was selected. A map showing segments within a sub-unit is on page 20. Two numbers are shown within each segment. The number underlined is the number of households. The other number is the serial number of the segment. An example of segment record form showing some of the segments, within a sub-unit, is on page 22.

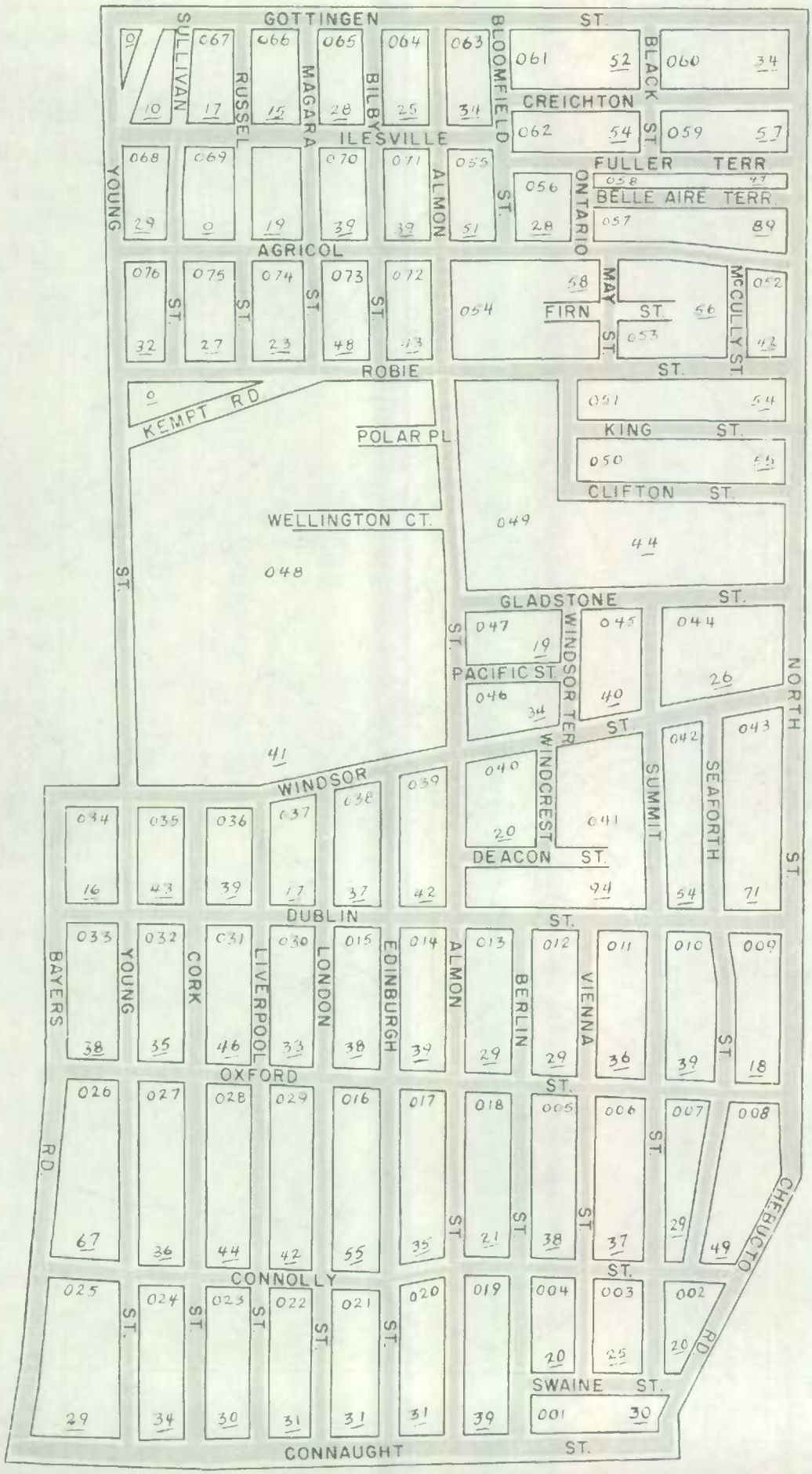
(c) Selection of Segments

The selection of segments was carried out, **independently in each sub-unit,** from a list (segment record form) of all segments within a sub-unit. In each sub-unit six or a multiple of six segments were to be selected for the Labour Force Survey. Each of the segments was assigned to a group from 1 to 6. These group numbers specify the months in which the households in the segment will **rotate.** For example in all segments belonging to group 1 rotation of households occurs in January and July; segments belonging to group 2 rotate February and August and so on. This system provides easy identification of the households by the length of time they have been in the sample. It also facilitates the selection of sub-samples from the Labour Force Survey for various purposes; each group being a 1/6 sample of the Labour Force Survey sample.



CENSUS OF CANADA, 1961

RECENSEMENT DU CANADA, 1961


GOTTINGEN ST.
SULLIVAN
RUSSEL
MAGARA
BILBY
BLOOMFIELD
BLACK
CREICHTON ST.
ILESVILLE
FULLER TERR
BELLE AIRE TERR.
YOUNG
ALMON ST.
ONTARIO
AGRICOL
MAY
FIRN ST.
McCULLY ST.
ROBIE
KEMPT RD
POLAR PL
KING ST.
CLIFTON ST.
WELLINGTON CT.
GLADSTONE ST.
PACIFIC ST.
WINDSOR TER
NORTH ST.
WINDSOR
WINDCREST
SUMMIT
SEAFORTH
DEACON ST.
DUBLIN ST.
BAYERS RD.
YOUNG
CORK
LIVERPOOL
LONDON
EDINBURGH
ALMON
BERLIN
VIENNA
OXFORD ST.
CHEBUCTO RD
CONNOLLY ST.
SWAINE ST.
CONNAUGHT ST.

The number of segments to be selected, and the expected number of sampled households per selected segment (called density factor) were calculated as follows:

Let 1/R be the overall provincial sampling ratio (1/125 or 0.8% in Alberta) and let N be the total number of households in the sub-unit. Then d = density factor = $\frac{1}{R} \times \frac{N}{k}$; where k = segments = 6, 12, 18, etc. and it is so chosen that d varies between 3 and 9. Having determined k and d in this way, it is ensured that k segments are selected in the sub-unit and in each segment the expected number of households will be d.

The probability of selection for each segment in the sub-unit was proportional to the number of households contained in it.

An example of the segment selection procedure is given on segment record page 22. This is a list of segments within a sub-unit. The first two columns are used for field identification purposes; the third column shows the number of households per segment; the fourth column gives the "segment size" (the number of households divided by the density factor $\frac{H}{d}$); the fifth column is the accumulation of "segment sizes". The sampling ratio for the sub-unit (1/62.5), applied to cumulative size determines the selected segments. The sub-sampling ratio for each selected segment is computed and is equal to d/H which is the reciprocal of the "segment size".

(d) Selection of Households

For each selected segment a diagram was drawn on a segment list showing the segment identification segment sub-sampling ratio and a random start. These segment list forms were sent to the regional office where all of the households in the segment were listed. A sample of households for the Labour Force Survey was selected by applying the segment sub-sampling ratio for the selected segments.

(e) Special Selections

1. Apartment Buildings

In the larger self-representing units a special sample of large apartment houses was set up. The purpose of the special sample was twofold: a) to improve the representation (as in stratification) of the apartment dwellers; b) to improve the stability (to reduce the variance) of the sample take. The latter objective is particularly important since the sampling ratio of each segment is determined at the time the segment is established. Therefore, if at some later date a large apartment block is constructed within the boundaries of the segment the sampling ratio which originally would have yielded 5 or 6 households may now yield several times as many. Apartment buildings with more than 30 units and more than 5 stories were therefore excluded from the regular sample and were sampled separately, thus reducing the variability of sample take and consequently the variability of the estimates. A system of reporting new apartment construction was set up and as new apartment buildings are reported they are added to the existing list of apartment buildings.

The sampling procedure of the apartment sample is similar to that in the regular sample, each apartment building constituting a segment.

2. Special Dwelling Units

Smaller collective type or institutional dwellings such as homes for the aged, convents, nursing homes, hostels, etc. within the selected segments were considered as **special dwelling units.** A separate list of residents or rooms is maintained in each special dwelling unit and the sample is selected from the list using the sampling ratio of the segment.

Sheet No. _____

Sampling ratio 1/62.5

DOMINION BUREAU OF STATISTICS

Special Surveys Division

P.S.U. | 2 | 2 | 1 | 0 | 4 |

D.F.: 10.9866 = 5.4933
2

Random start 29

SEGMENT RECORD

Municipality Halifax

1 Segment number	2 Serial number	3 No. of D.U.	4 Size (S.R.)	5 Cumulated size	6 Selected segments					Remarks
					I	II	III	IV	V	
014	001	30	5	5						
024	002	20	4	9						
034	003	25	5	14						
044	004	20	3	17						
054	005	38	7	24						
064	006	37	7	31	Int. S.					R.S. 5
074	007	29	5	36						
084	008	49	9	45						
094	009	18	3	48						
104	010	39	8	56						
114	011	36	6	62						
124	012	29	5	67						
015	013	29	6	73						
025	014	39	7	80						
035	015	38	7	87						
045	016	55	10	97	Int. S.					R.S. 6
055	017	35	6	103						
065	018	21	4	107						
075	019	39	7	114						
085	020	31	6	120						
095	021	31	5	125						
016	022	31	6	131						
026	023	30	5	136						
036	024	34	7	143						
046	025	29	5	148						
056	026	67	12	160	Int. S.					R.S. 6
066	027	36	7	167						
076	028	44	8	175						
086	029	42	7	182						
096	030	33	6	188						
011	031	46	9	197						
021	032	35	6	203						
031	033	38	7	210						

9604-90: 9-7-63

PART V

NUMERICAL IDENTIFICATION AND PROCESSING OF SURVEY RESULTS

A. Numerical Identification System

The following is the 12-digit numbering system for the Labour Force Survey sample.

The first 5-digit group identifies the primary sampling unit.

The next 3-digit group identifies the segment.

The last 4-digit group identifies the households.

The First Digit

The first digit identifies the province as follows:

Newfoundland	0
Prince Edward Island	1
Nova Scotia	2
New Brunswick	3
Quebec	4
Ontario	5
Manitoba	6
Saskatchewan	7
Alberta	8
British Columbia	9

The Second Digit

The Second digit indicates the economic region. This allows for ten economic regions per province.

The Third Digit

The third digit, 0, indicates non-self-representing units.

If the third digit is other than 0, this indicates the city number within a specified economic region. Cities are numbered by order of size within an economic region.

The Fourth and Fifth Digits

In the self-representing units, the fourth and fifth digits indicate the sub-units within the self-representing unit. A sub-unit has approximately 15,000 population and it is comprised of one or more census tracts.

In the non-self-representing units, the fourth and fifth digits indicate the stratum and primary sampling unit within the economic region, e.g. stratum 00 would have primary sampling units numbered from 01 to 19.

Stratum 20 would have primary sampling units numbered from 21 to 39.

This would allow for a maximum of 5 strata per economic region and 19 primary sampling units per stratum.

Examples

The numerical designation for primary sampling unit No. 3 in the third stratum of Economic Region 52 in Ontario would be 52043.

Province	+ E.R.	Indication of N.S.R.U.	Stratum	P.S.U.
5	2	0	4	3

The numerical designation for the 12th sub-unit of the largest city in Economic Region 52 in Ontario would be 52112.

Province	+ E.R.	City	Sub-unit within city
5	2	1	12

The Sixth, Seventh and Eighth Digits

In non-self-representing units, the sixth and seventh digits identify the segment and the eighth digit is the rotation group number. Urban segments will be numbered in the range 01 to 49 and rural segments from 50 to 99. In self-representing units, the segments are numbered from 01 to 99 in the sixth and seventh digit, while retaining the rotation group number in the eighth digit.

The Last Four Digits, Ninth to Twelfth

In non-self-representing units, the ninth and tenth digits identify the cluster and the eleventh and twelfth identify the household number. In self-representing units and unclustered segments, the four digits are used as the household number.

Multiple Households

Multiple households are given the same household identification as the parent household but are identified by the line numbers, on the household record card.

Line numbers 01 to 19 identify the parent household.

Line numbers 20 to 39 identify the 2nd household.

Line numbers 40 to 59 identify the 3rd household, etc.

B. Enumeration

The Labour Force Survey operation is a combined effort of the head office staff and the field staff. The field staff consists of eight **regional officers** and their staff. The actual enumeration is carried out by enumerators whose recruitment and selection is a continuous task for the supervisory staff because of a fairly high turnover every year. To be employed as an enumerator, the candidate has to pass a written test and an interview to establish his suitability for the job. Ideally each enumerator should live within a primary sampling unit

in which the work has to be performed. Since the operation of the Labour Force Survey requires a staff of carefully trained enumerators, provision has been made for continual instruction throughout employment (see training manual). In addition to regular training, there are two main elements of so-called **quality control program.** The first is the **re-enumeration** whose basic purpose is to measure and improve the quality of the enumeration of the individual enumerator. This is accomplished by having field staff re-enumerate a number of the sample households visited by the enumerator. On completion of the re-enumeration, the re-enumerator arranges a meeting with the enumerator for the purpose of discussing all phases of the re-enumeration.

The second element of the quality control program is the **observation** whose purpose is to learn if the enumerator is carrying out enumeration in the manner indicated in the training manual. Each enumerator is observed once a year as an integral part of the training program. Some enumerators are observed more often depending upon their performance. The exact nature, frequency and the size of the re-enumeration and the observation are described in the procedures manual called "re-enumeration program" and "observation instruction" respectively.

C. Processing of Survey Results

There are seven main stages in the handling of Labour Force Survey material from its reception in the head office to its final tabular form. At present, these stages are:

(a) Incoming control,

(b) Coding of industry and occupation,

(c) Punched card production and editing,

(d) Transfer of survey records from card to tape,

(e) Balancing of survey returns,

(f) Weighting of survey records to projected population,

(g) Tabulation and compilation.

Descriptions of each stage follow:

(a) Incoming Control

Each day from beginning to completion of a survey, schedules received at the regional offices from enumerators are shipped to **head office** in serially-numbered boxes. On reception there, the contents of each box are transferred to a processing tray; the tray is identified with the regional office box serial number and constitutes a processing unit. The date and time of receipt and estimated number of schedules are entered on an incoming control record and the tray is passed on to the next stage.

(b) Coding of Industry and Occupation

The industry and occupation of persons reported as having worked, as having looked for work, or as with a job but not at work in the reference week are classified by broad groups on the mark-sense schedule. At the present, industry is coded on the basis of the **1948 standard industrial classification** with enough detail to allow rearrangement to the revised standard industrial classification as used in the 1961 Census. Likewise, occupation coding is based on the **1951 Census classification of occupations** convertible to the **1961 Census classification.**

Due to shortage of staff and facilities, approximately one-third of the records for employed persons are coded for industry and occupation. Each month the records from two of the six rotation groups of segments are coded – a different two in each successive three months. Statistics produced each month in respect to the employed by industry and occupation are on a **3-month average basis.** Distinction between agricultural and non-agricultural employment is made on all records for the employed each month and monthly statistics are produced on **agricultural and non-agricultural employment.**

Unemployment statistics by industry and occupation are published in the form of unemployment rates based on estimates averaged for calendar quarters. To produce even this limited amount of data, it is necessary to code all of the records for the unemployed by industry and occupation every month.

(c) Punched Card Production and Editing

After industry and occupation have been coded, the mark-sense schedules are turned over to the Tabulating Services Division for transfer of the data to punched cards. The schedules are run through the document reproducing punch and the resulting punched cards are edited on the **electronic statistical machine.** This mechanical edit tests the data on the punched cards for **completeness** and **consistency.** Punched cards rejected in the mechanical edit are matched with the corresponding schedules and the faults corrected. Inconsistencies are rectified on the preponderance of evidence contained on the schedules, previous survey records being consulted where useful. Omission of data is compensated by reference to schedules for previous surveys where applicable (where the particular person has been enumerated in previous survey), or by random or systematic substitution. New punched cards are made from the amended mark-sense schedules. The type of **discrepancy** is written on the rejected punched cards and an analysis of errors is compiled from them for each enumerator; these **analyses of enumerators' errors** are forwarded to the relevant regional offices for use there in re-instruction of enumerators.

(d) Transfer to Survey Records from Card to Tape

When stage (c) is completed, the punched cards produced for the current survey are turned over "en bloc" to the computer room. There the records are

transferred to tape. The records are sorted by **computer** into order by primary sampling unit, segment, household, and individual numbers (line numbers). Then the primary sampling unit and segment identification of the individual records are compared by computer with a master file of segments in the current sample, to ensure that they are acceptable for the balancing unit.

(e) Balancing of Survey Returns

A sub-weight is attached to the records in each "balancing unit" (a balancing unit comprises a self-representing sub-unit, or the rural or urban part of a non-self-representing unit). The purpose of the sub-weight is to compensate for differential response rates as between balancing units. The sub-weight is the number of households assigned for enumeration in the balancing unit, divided by the number of households for which interviews were obtained, multiplied (a) by the reciprocal of the **sampling ratio for the stratum** and (b) in the case of non-self-representing units by a **provincial rural-urban factor** calculated to adjust the proportion of the rural-urban population in the sampled primary sampling units to the known provincial ratio (1961 Census data).

(f) Weighting of Survey Records to Projected Population

The balanced survey results are weighted up to **population estimates** projected from the 1961 Census to the current reference period. This is done in each of the 10 provinces and 20 age-sex groups. Weighting sub-factors are obtained by accumulating balancing sub-weights in the 200 age, sex and province categories. The age-sex sub-weight is calculated using these accumulations as denominators with the numerators being the projected populations in the corresponding age and sex groups. The **final weight** attached to each record is the product of the **balancing sub-weight** and the **age-sex sub-weight.** The estimates for each Labour Force classification are tabulated by adding the final weights for all records (persons) in that classification.

(g) Tabulation and Compilation

Tabulation is done **on the computer** and about 100 tables are tabulated monthly. In compiling tables for publication or other circulation, **the estimates** are rounded to thousands. In the published tables, estimates rounding to less than 10,000 are suppressed.

PART VI

ROTATION OF THE SAMPLE

A. Introduction

Rotation of the sample is a **complete or partial replacement** of the sample unit. It is conducted in a systematic way every month at certain defined intervals. The rotation of the sample must be such that **every month** the sample is a **probability sample** of the population covered by the survey. The main purpose of rotation is to relieve survey respondents from the burden of reporting after six months in the survey. It is quite possible that if the same respondents were asked to provide information month after month it might substantially increase the refusal rate thus reducing the **efficiency of the sample.** Furthermore, through rotation of the sample, information is accumulated from additional households each month. This may be utilized to reduce the sampling error through the application of a procedure known as **"composite estimation".**

B. Rotation Method Used in Labour Force Survey

(a) Non-self-representing Units

When selected segments have been clustered, they are numbered in a serpentine way starting with 01, 02, 03, etc. All these clusters are listed by "size" (number of households contained within clusters). The clusters are systematically divided into as many samples as is indicated by the denominator of the segment sub-sampling ratio. For example if the segment sub-sampling ratio is 1/4, then each month one-fourth of the clusters in that segment are to be in the sample. Thus there are four different samples of clusters in that segment. One sample of clusters is selected and the households within these clusters are enumerated for six consecutive months, then the clusters are replaced by the next sample of clusters which remain in the sample for six months, etc. It is clear that the households in a particular segment always rotate in the same two months of the year, which are six months apart. Thus the segment belongs to one of six **rotation groups** (1, 2, 3, 4, 5 or 6). These numbers specify the months in which the households in the segments, belonging to these groups, rotate, e.g. group 1 rotates in January and July, group 2 rotates in February and August, etc. In constructing the six rotation groups, the sampled segments have been distributed in such a way, that each group of segments rotating at the same time provides a representative sub-sample of all the sampled segments within a province. Thus, each of the six rotation groups constitutes a sub-sample of approximately 1/6 of both the urban and the rural population. Eventually, all the households in the segment will be enumerated and in this case it is said that the segment is exhausted. When a segment is exhausted it is replaced by another segment from the same primary sampling unit. The segment group number not only specifies the month for the rotation of households within a segment, but also in conjunction with the sampling ratio, provides the date for the replacement of exhausted segments. It is seen from the foregoing description that in the rotation process households are replaced every six months but the segments within a primary sampling unit are replaced at a much slower rate (about 2 years).

(b) Self-representing Units

As in the non-self-representing unit, segments in the self-representing units are assigned to either group 1, 2, 3, 4, 5 or 6. These group numbers, like the group numbers for segments in the non-self-representing unit, specify the months in which the households within the segments or segments themselves rotate. The selected households within each segment remain in the sample for six consecutive months and after that period they are replaced by a group of households from the same segment. When all the households within a segment have been enumerated six times, the segment is considered exhausted and it must be replaced by the next segment on the list from the same sub-unit and with the same group number.

PART VII

SAMPLE CONTROL

A. Introduction

The foregoing description of the Labour Force Survey sample clearly shows that the sample is selected monthly under a rather complicated design from a universe that is continually growing and changing. Therefore it is vitally necessary to ensure, through a regular program of controls, that sampling is indeed carried out in the field as laid down in the design. This involves

1. Regular rotation of clusters and segments;
2. Updating apartment sample lists and selections;
3. Systematic review and redesign of self-representing units;
4. Systematic review and redesign of non-self-representing units;
5. Research into the operation of sample.

B. Regular Rotation

The designation of the monthly samples is carried out at the head office. Control records and sampling materials (i.e. maps, etc.) are set up at least six months in advance of the rotation of clusters or segments. These are sent to the regional office at least six months in advance of their introduction into the sample. This is necessary to enable the regional office to perform field work such as counting, listing and organizing of enumerators' assignments. Description of counting and listing may be found in the procedures manual called "counting instructions" and "listing instructions" respectively.

C. Updating Apartment Sample Lists

The universe from which the sample of apartments is drawn is an extremely fast growing one. In fact this is the main reason for creating such a separate universe. It is necessary, therefore, to maintain an up-to-date list of apartment buildings meeting the criteria for the apartment sample. Two independent sources of information are used. Central Mortgage and Housing Corporation has agreed to supply a list of new apartment buildings each month from their survey of starts and completions of residential construction. The regional office staff makes a periodic report on new apartment construction based on municipal assessment reports and other local enquiries. This information when received at head office is verified and if the apartment buildings meet the criteria they are added to the list and are given the usual chance of selection.

D. Systematic Review and Redesign of S.R.U.'s

The design of the Labour Force Survey is such that it facilitates the possibility of redesign of any of its parts, if necessary, in order to keep up with the rapidly changing population which is being studied. Each sub-unit in each self-representing unit is reviewed periodically in the field according to a specified time table by field representatives and where extraordinary growth or change is discovered the sub-unit is completely redesigned and a new sample is selected.

E. Systematic Review and Redesign of N.S.R.U.'s

After each census, usually every five years, a complete review of each economic region and stratum will be undertaken by comparing the results of the current census for the economic region or stratum with the results of the previous census for the same area. In areas where substantial changes have occurred since the 1961 Census a complete revision of the stratum or economic region will be carried out and a new sample selected.

F. Research into the Operation of the Sample

Continual research will be carried out into the operation of the sample. The number of sampling units in the sample at all levels of sampling will be compared with the theoretically predicted numbers in order to discover any errors that may have occurred. The causes of variation in sample takes will be studied in order to devise better sampling methods where possible. Research into methods of reducing the cost of the survey, the effectiveness of stratification, optimum allocation of sample are some of the other projects to be carried out in order to improve the Labour Force Survey wherever possible.

PART VIII

ESTIMATION

A. Introduction

A probability sample is usually selected for the purpose of deriving inferences concerning the population from which the sample was drawn. The inferences are obtained by using a method referred to as the **estimation procedure.**

The principle behind the estimation procedure is that each person in the sample "represents" besides himself or herself, several other persons not in the sample. For example, in a simple random sample of 2%, each person in the sample represents 50 persons in the population. This could be achieved by producing 50 duplicates of each record in the sample and then proceed to compile any aggregates or cross-classifications which would now refer to the entire population and would represent the estimates for the corresponding quantities in the population as obtained from the 2% sample.

Instead of physically duplicating the sample records, an overall weighting factor is entered on each record. The weighting factor refers to the number of times a particular record should be duplicated. For example, if the number of persons employed in manufacturing is to be estimated, this may be done by sorting the records referring to those persons in the sample employed in manufacturing and summing the weights entered on these records.

In a probability sample, the sample design itself determines weights which may be used to produce unbiased estimates; each record may be weighted by the inverse of the probability of selecting the person to whom the record refers (in the example of the 2% random sample this probability would be 0.02 for each person and so the records could be weighted by $1/0.02 = 50$). This may be called the simple estimate. The efficiency of a design is usually measured by the so-called **mean square errors** of one or more characteristics utilizing the sample data and the weights based on the design. The mean square error is defined as the average, over all possible samples, of the square of the deviations of the estimated aggregate from the true. Under certain circumstances, if objective information is available from sources other than the survey itself, the weights may be adjusted to reduce the mean square error of the estimate and thus increase its reliability. One such way of utilizing relevant information external to the survey is known as **ratio estimation.** The principle of ratio estimation may be summarized as follows: suppose that simple estimates of aggregates are produced for certain classifications of the population (i.e. for age-sex groups or for the population in rural and urban areas, etc.) utilizing the simple estimating procedure described above. Assume also that reliable estimates or actual counts are available by aggregates from sources outside of the survey for the same classifications of the population. One may then compare the estimates derived from the survey with those obtained from outside sources. The estimates from the outside sources are divided by the sample estimates for each classification and the weights of the records in each classification are adjusted by multiplying the weights of this factor. After the adjustment of the weights the estimated aggregates will now agree with the estimate from the independent source for each classification.

In the Labour Force Survey, as described on page 25 (f), the **final weight** attached to each record is derived in four steps and is the product of four factors. These are known as rural-urban factor ratio (estimate); balancing factor for non-response; basic provincial weight; weighting to projected population (ratio estimate).

B. Rural-urban Factor

Information concerning the total population in rural and urban areas is available from the 1961 Census for each primary sampling unit (whether it is in the sample or not) as well as for each province. Using the selected primary sampling units only, and dividing their 1961 rural or urban population by the known probability of selection, a "simple estimate" of the 1961 rural or urban population is obtained for each province. Comparison, by province, with the actual 1961 rural or urban census counts indicates whether the selected primary sampling units over-or-under-represent the respective areas. The ratio of the actual rural-urban counts divided by the estimates provides a rural and an urban factor for each province in the ratio estimate. These two factors are computed for each province at the time the primary sampling units are selected and from there on are entered on each sample record coming from the appropriate (rural or urban) area of that province.

C. Balancing for Non-response

Each month, the sample design completely specifies the households that are to be enumerated during enumeration week. Each enumerator is assigned a set of households and is given firm instructions to make every effort to enumerate these households. However, some **non-response** is virtually certain to occur in any survey of human population whether it is because there is no one at home during the enumeration week, or for some other reason. This means that the enumerated households have to represent slightly more households than was intended in the design of the survey. This is achieved by increasing their weight by the so-called balancing factor. This balancing is carried out within each of the so-called balancing units. In the non-self-representing areas each sampled primary sampling unit is divided into two balancing units (a – urban

and b—rural parts) and in the self-representing units each sub-unit is a balancing unit. For each balancing unit the number of households, which should have been enumerated is divided by the number actually enumerated and this ratio (the balancing factor) is then entered on each sample record in that balancing unit. The estimates which are weighted up to the balancing unit by this ratio are based on the assumption that the households that have been enumerated represent the characteristics of the households that should have been enumerated. However, if this assumption is not true the estimates will be biased and the bias will increase with a higher rate of non-response. The exact magnitude of bias introduced by the adjustment for non-response is impossible to calculate. Consequently, rather than depend entirely on the adjustments for non-response every effort should be made **to reduce** it in the field.

D. Basic Weighting Factor

As described in the introduction, the sample design itself determines a set of basic weights to be applied to each record referring to persons in the sample. This is called the **basic weighting factor.** The sample design is such that within the same province the basic weights are identical for each record (person) in the sample and are equal to one over the provincial sampling ratio. Such a design is called a **self-weighting design.** Using the basic weights and balancing factors only, valid estimates could be produced. The rural-urban factor and the age-sex factor, described in the next section, are simply refinements which improve the final estimates.

By applying the previously described three weighting factors, a valid estimate could be derived for any aggregates for which information was obtained during the enumeration. In particular, estimates of the total number of persons are produced in each of the ten provinces in each of twenty age-sex groups. Independent estimates are available monthly for the totals in these 200 province-age-sex classes by projecting forward the 1961 Census counts. In each class the independent estimate is divided by the sample estimate and this ratio is called the age-sex factor (ratio estimate). The age-sex factor is entered on all the records belonging to the appropriate class. The 10 age groups are 14, 15-16, 17-19, 20-24, 25-34, 35-44, 45-54,55-64, 65-69, 70 or over.

E. Final Weights

The final weight of each record is the product of the four factors described above. In the final tabulations the estimated aggregate of each classification is obtained by summing the final weights of those records which indicate the presence of the characteristic. For example, to obtain the estimated aggregate of unemployed, the final weights of those records that indicate unemployment are summed.

F. Algebraic Description of the Estimation

The estimation procedure described above can be stated algebraically, and the following subscripts will be needed for that purpose:

p — For province.

h — For stratum in the non-self-representing areas and sub-unit in self-representing areas.

i — For the selected primary sampling units in stratum h (it is redundant in self-representing areas).

j — For type of area (j = 1 self-representing, j = 2 non-self-representing urban, j = 3 non-self-representing rural).

a — For age-sex groups.

A quantity referring to province p, stratum (or sub-unit) h, primary sampling unit i (in non-self-representing areas), type of area j and age-sex group a will be referred to briefly as the quantity in (p, h, i, j, a).

The following notation will be used:

p_{phija} — Number of persons in the sample in (p, h, i, j, a).

X_{phija} — Number of persons in the sample having a particular labour force characterisitc in (p, h, i, j, a).

$P_{(61)phij}$ — 1961 Census count of persons in province p, stratum h, primary sampling unit i, type of area j.

$P_{(61)phi.}$ — 1961 Census count of persons in province p, stratum h, primary sampling unit i.

$P_{(61)ph..}$ — 1961 Census count of persons in province p, stratum h.

$P_{(61)p..j}$ — 1961 Census count of persons in province p, type of area j.

P_{pa} — Total population as projected forward from the 1961 Census count to the current month in province p, age-sex group a.

First the **rural-urban factor** F_{pj} is calculated for province p, type of area j. There is no such correction for the self-representing areas, so

$$F_{pj} = 1$$

if j signifies a self-representing area (j = 1). In the non-self-representing areas the probability of selecting primary sampling unit i in stratum h, province p is proportional to its 1961 Census population and is actually equal to[1]

$$\frac{2\,P_{(61)phi.}}{P_{(61)ph..}}$$

[1] See I.P. Fellegi: Sampling with varying probabilities without replacement (Journal of the American Statistical Association, March 1963).

The estimate derived from the sampled primary sampling units for the 1961 population in province p and type of area j is therefore equal to

$$\hat{P}_{(61)p..j} = \sum_h \sum_i \frac{P_{(61)ph..}}{2P_{(61)phi.}} P_{(61)phij}$$

The rural-urban factor is therefore equal to

$$F_{pj} = \frac{P_{(61)p..j}}{\hat{P}_{(61)p..j}}$$

if j signifies non-self-representing rural or urban areas (j = 2 or j = 3)

Next the **balancing factor** $\left(B_{phij}\right)$ is calculated

$$B_{phij} = \frac{\text{number of households expected}}{\text{number of households enumerated}}$$ in the sample in province p, stratum (or sub-unit) h, primary sampling unit i (in non-self-representing areas), type of area j.

The **basic weight**, as indicated in section D, is the inverse of the overall provincial sampling ratio since the sample is self-weighting. This weight is identical for self-representing, non-self-representing urban and rural areas. It is denoted by

$$W_p$$

The **age-sex factor** is computed for each of 200 province-age-sex classifications as the ratio of the projected count and the sample estimate of total population for that classification. The sample estimate for a province-age-sex classification, based on the previously developed three weighting factors is equal to

$$\hat{P}_{pa} = \sum_h \sum_i \sum_j F_{pj} B_{phij} W_p P_{phija}$$

Therefore the age-sex factor is equal to

$$A_{pa} = \frac{P_{pa}}{\hat{P}_{pa}}$$

Now the **final weight** is computed as the product of the four weighting factors

$$W_{phija} = F_{pj} B_{phij} W_p A_{pa}$$

and the **provincial estimate** $\left(X_p\right)$ for a labour force characteristic is then obtained

$$X_p = \sum_h \sum_i \sum_j \sum_a W_{phij} X_{phija}$$

PART IX

SAMPLING AND NON-SAMPLING ERRORS

A. Sampling Errors

When estimates are derived from information obtained from a sample, they are generally subject to a certain margin of error. The information for the Labour Force Survey in a given month is derived from a particular sample selected at random in that month. Had a different sample been selected a different estimate would have resulted. The sampling and estimating procedures are said to be **unbiased** when the average of the different estimates corresponding to the different conceivable samples is equal to the estimate that would have been derived from a complete enumeration of the population under the same conditions. This is called the **expected value** of the estimate. The Labour Force Survey sampling and estimating procedure is close to being unbiased. Unless a 100% sample is taken it is not possible to estimate the differences of the estimate derived from an actual sample and its expected value. The square of this difference, averaged over the various conceivable samples which could have been drawn is called the **variance** of the sample estimates. If the variance is small, this means therefore that the estimates corresponding to the different conceivable samples are generally close to the expected value. If, on the other hand, the variance is large, then **at least** some of the possible estimates would have a large margin of error. The square root of the variance is called the **standard deviation** of the estimates. It is the most important feature of probability sampling that the variance of the estimates (and hence the standard deviation) may be estimated from the selected sample itself. The range (estimate ± standard deviation) has the property that it includes the corresponding expected value with a probability of approximately 0.68 (i.e. 68% of the time), while the range (estimate ± two times the standard deviation) includes the corresponding expected value with a probability of approximately 0.95 (i.e. 95% of the time).

Whether the expected value of an estimate is equal to the "true value" one is trying to estimate depends on the presence or absence of biases. In general, the difference between the expected value of an estimate and the "true value" is called the **bias of the estimate.** If the sampling and estimating procedure is unbiased then this bias is referred to as **non-sampling bias.** The sources, the effect and the control of non-sampling biases in the Labour Force Survey are discussed in Section B.

B. Non-sampling Errors

The statistics obtained from any sample survey are subject to sampling errors, but in addition they are also subject to non-sampling errors. The sampling error has been described above. The non-sampling error arises from entirely different sources and is present even if the estimates are derived from a 100% sample, such as the census.

Every month a Labour Force Survey enumerator calls on each selected household and obtains the required information concerning all members of the household by interviewing at least one responsible member of the household. In the course of the interview, information is requested, provided, received and recorded. Non-sampling errors may be introduced at all of these steps. The questions may be misinterpreted by the interviewee, he or she may not know or may not remember the correct answer, the enumerator may misinterpret the answers or may make an incorrect entry in his records. This **response error** may not be too important for some inquiries (such as sex or marital status) but it may be exceedingly important for others (such as employment, unemployment, industry, occupation, etc., particularly in borderline cases). The Labour Force Survey requires the interviewing of approximately 35,000 households by 600 enumerators each month and the nature of the inquiry is highly susceptible to response errors. Unless these are very thoroughly and uniformly controlled, their effect on the final estimates may exceed the effect of the sampling errors. Some of the means by which response errors are controlled in the Labour Force Survey are described below.

(a) Questionnaire Design

Questions may be worked in such a way that they are subject to a variety of interpretation. The information entered on such a questionnaire would be of doubtful value. The questionnaires used in the Labour Force Survey are very carefully designed to provide little room for different interpretations and the enumerators are instructed to ask the questions as printed on the questionnaires.

(b) Errors Due to Enumerators and their Control

There is clearly scope for the enumerators to affect the results of the interview. Such effects may be accidental in the sense that an enumerator alters the wording of a question by mistake and in this case the errors would probably cancel out over a large number of interviews. Even if the questions are worded correctly the interpretation of the answers may be influenced by the enumerator's views and expectations; this is particularly so in borderline cases. This may be called the **enumerator effect.** For example, if the enumerator has strong views on the matter of unemployment, he may project his views into the answers given by the interviewee particularly if these answers are sufficiently vague. If different enumerators have different views, their effect may cancel out over a large number of enumerators. However, if enumerators tend to have similar views then this produces a **response bias.** That part of the response errors which cancels out over a large number of interviews or enumerators is called **response variance.** The larger the difference between the "enumerator effects" the larger the contribution from this source to the error of the survey. It is vitally important, therefore, that the enumerators should operate according to uniform standards.

Uniformity of standards can be achieved through a careful **selection of the enumerators**, a thorough **training program** as well as a regular program of **control** and **retraining**. Enumerators are hired on the basis of a written examination and a personal interview conducted by supervisory personnel. After they are hired they are subjected to a thorough training program at the end of which they take an examination which is conducted in the field. During their first days of enumeration they are accompanied by supervisory personnel. The exact nature and length of the training program is described in the Labour Force Survey training manual. After the initial training and observation each enumerator is subjected at least once a year to the **re-enumeration program**. In the course of this program, a subsample of the households assigned to the enumerator are re-enumerated a week later by supervisory personnel. The supervisor compares the results obtained by the enumerator and by himself and attempts to reconcile all differences before leaving the household. The supervisor then discusses the problems with the enumerator and if necessary arranges for the enumerator's retraining. A detailed description of the re-enumeration program may be found in the Labour Force Survey procedures manual. In addition to re-enumeration a so-called **observation program** is also conducted in the course of which a supervisor accompanies the enumerator in order to observe whether the enumerator adheres to the standard procedures and understands the concepts. For details the reader is again referred to the Labour Force Survey procedures manual.

The programs described above are conducted by the eight regional offices but they are all carried out on the basis of the same training and instruction manuals and are coordinated and supervised by the head office personnel. This results in uniformity of standards not only between enumerators but also between regional offices.

C. Variance Estimation (algebraic description)

The variance of the final estimates produced from the Labour Force Survey may be estimated using the sample data. A slight modification of the notation used in Part VIII, Section F is needed.

For the purposes of variance estimation so-called **paired areas** are designated. In the non-self-representing areas each stratum is a "paired area" and the two selected primary sampling units of each stratum are the two **"parts of the paired area"**. In the self-representing areas paired areas are created in the following way: a group of (generally) two to four sub-units is designated as a "paired area", the sample of segments in these sub-units is divided at random into subsamples and these two subsamples are called the "two parts of the paired area".

Accordingly in the non-self-representing areas the subscripts (p, h, i, j, a) may have the same significance in this section as in Part VIII, Section F and the subscript h may interchangeably be referred to as stratum h or "paired area h", while the subscript i may interchangeably be referred to as the selected primary sampling unit i or one "part of the paired area".

In the self-representing units, however, the significance of the subscripts h and i has to be altered slightly. As the reader will recall, in the section on estimation the subscript h referred to a sub-unit while the subscript i was redundant. In the present section h will be used to designate a paired area (a group of sub-units) and i will designate the parts of the paired area.

In both non-self-representing and self-representing areas therefore h and i will designate the "i-th part (i = 1 or i = 2) of paired area h".

Let r_{pa} be the estimated proportion of the population in province p, age-sex group a having the labour force characteristic X whose estimation was described in Part VIII, Section F and whose variance is to be estimated now.

$$r_{pa} = \frac{1}{P_{pa}} \sum_h \sum_i \sum_j W_{phija} X_{phija}$$

Let

$$\hat{P}_{phia}$$

be the estimated population, age-sex group a of the i-th part of paired area h in province p. $\hat{P}_{phia}$ is simply the sum of the final weights on all the records referring to sampled persons in (p, h, i, a). Similarly let

$$X_{phi}$$

be the estimated number of persons having the labour force characteristic X in the i-th part of paired area h in province p. X_{phi} is the sum of weights on all the records referring to sampled persons having the characteristic X in (p, h, i). Then the so-called D-value is computed for each paired area of province p as

$$D_{ph} = X_{ph1} - X_{ph2} - \sum_a r_{pa} (\hat{P}_{ph1a} - \hat{P}_{ph2a})$$

The variance of the provincial estimate X_p is then estimated by the sum of squares of the D-values added over all paired areas of the province, i.e.

$$\hat{V}(X_p) = \sum_h D_{ph}^2$$

The variance of the estimated month-to-month change is estimated as follows:

Let X_{pm} be the provincial estimate X_p calculated in month m. Let D_{phm} be the D-value in paired area h in month m. Then the variance of the month-to-month change between month m and month n is estimated as

$$\hat{V}(X_{pm} - X_{pn}) = \hat{V}(X_{pm}) + \hat{V}(X_{pn}) - 2 \sum_h D_{phm} D_{phn}$$

The variance of national estimates (for level or change) is estimated by the sum of the provincial variance estimates.

The standard deviation of any estimate is estimated by the square root of the corresponding variance estimate.

PART X

PUBLICATIONS

Each month the following publications are issued concerning the Labour Force Statistics:

1. The Labour Force, "Employment – Unemployment"[1]

This is a joint press release prepared by the Dominion Bureau of Statistics and the Department of Labour. It provides "summary labour force statistics" for Canada for a particular month, preceding month and a month one year ago. Similar statistics are provided by Regions. Unemployment rates, actual and seasonally adjusted, are published in this release for the whole year by months.

2. The Labour Force[2]

This is a publication prepared by the Special Surveys Division of the Dominion Bureau of Statistics. Apart from the information provided in the publication above, this bulletin refers to the labour force, employment, unemployment, labour force participation and unemployment rates. Furthermore, the distribution of unemployed by occupation and industry is also available in this bulletin.

[1] Available on request from Dominion Bureau of Statistics.

[2] Available on request from Special Surveys Division, Dominion Bureau of Statistics – Catalogue No. 71-001.

3. The Labour Force Survey – Monthly Report on Variance Estimates[3]

This report is prepared by the Sampling and Survey Research Staff of the Dominion Bureau of Statistics. An example of the form used for this report is given on page 34.

In addition to the published statistics, there is a considerable amount of data which can be obtained on request. Following is a list of material available.[4]

For Canada only:

1. Age and sex distribution;
2. Marital status and sex distributions;
3. Employed:
   (a) Reasons for working less than full-time
   (b) Hours worked by sex for total employed, agriculture and non-agriculture, and for paid workers, non-agriculture
   (c) Industry and occupation groups, by sex for total employed and for paid workers;
4. Persons not in the labour force by category.

For Regions:

1. Labour Force:
   (a) by age;
   (b) agriculture and non-agriculture by sex.
2. Employed by age.

[3] Available on request from Special Surveys Division, Dominion Bureau of Statistics.

[4] Special Surveys Division, Dominion Bureau of Statistics.

THE LABOUR FORCE SURVEY
MONTHLY REPORT ON VARIANCE ESTIMATES

March, 1964

Prepared by the Sampling and Survey Research Staff
Dominion Bureau of Statistics

Standard Deviation in Thousands by Selected Labour Force Characteristic for March, 1964 and Differences February, 1964 to March, 1964

Labour Force characteristic	March 1964		March 1964 – February 1964	
	Estimate	Standard deviation (Estimate)	Differences	Standard deviation (Differences)
1. Non-institutional population 14 years and over				
2. In Labour Force				
3. Employed				
4. Non-agriculture employed usually work 35– hours				
5. Non-agriculture employed usually work 35+ hours				
6. Non-agriculture employed at work 35+hours in 5 days				
7. Non-agriculture employed at work 35– hours in 5 days				
8. Unemployed				
9. Employed: Agriculture				
10. Paid non-agriculture workers				
11. In Labour Force: Males				
12. In Labour Force: Females				

Notes: S.D. (Standard deviation). The range (Estimate ± S.D.) covers the true value with a probability of approximately 68%.

The range (Estimate ± 2 S.D.) covers the true value with a probability of approximately 95%.

PART XI

CANADIAN LABOUR FORCE SURVEY

The Table Shows the Provincial Sampling Ratios the Number of P.S.U.'s and the Total Population by Type of Area

Province	Sampling ratio (%)	Number of selected P.S.U.'s			Population			
		S.R.U.	N.S.R.U.	Total	S.R.U.	N.S.R.U.	Special areas	1961 Census total
Newfoundland	1.6	16[1]	26[1]	42[1]	208,249	236,940	12,664	457,853
Prince Edward Island	1.6	2	6	8	29,270	75,359	–	104,629
Nova Scotia	1.6	6	30	36	353,803	374,748	8,456	737,007
New Brunswick	1.6	7	26	33	242,102	348,038	7,796	597,936
Quebec	.5	26	50	76	3,215,056	1,873,290	120,865	5,259,211
Ontario	.5	39	46	85	4,361,624	1,738,742	135,726	6,236,092
Manitoba	.8	2[1]	28[1]	30[1]	497,540[1]	416,146[1]	8,000[1]	921,686
Saskatchewan	.8	4[1]	36[1]	40[1]	260,041[1]	656,140[1]	9,000[1]	925,181
Alberta	.8	5	34	39	724,755	593,527	13,662	1,331,944
British Columbia	.7	8[1]	26[1]	34[1]	1,026,142[1]	587,940[1]	15,000[1]	1,629,082
Canada	**.67**	**115[1]**	**308[1]**	**423[1]**	**10,968,582[1]**	**6,900,870[1]**	**331,169[1]**	**18,200,621**

[1] These figures are estimates, since at the time of writing this report the Labour Force Survey has not been completed in these provinces.

P.S.U. – Primary Sampling Unit.

S.R.U. – Self-Representing Unit.

N.S.R.U. – Non-Self-Representing Unit.

Special Areas – These include institutions such as Hospitals, Schools, Military Establishments, Remote Areas, etc. The method of sampling in these areas has been described in this report (see page 16).

PART XII – APPENDICES

NEWFOUNDLAND

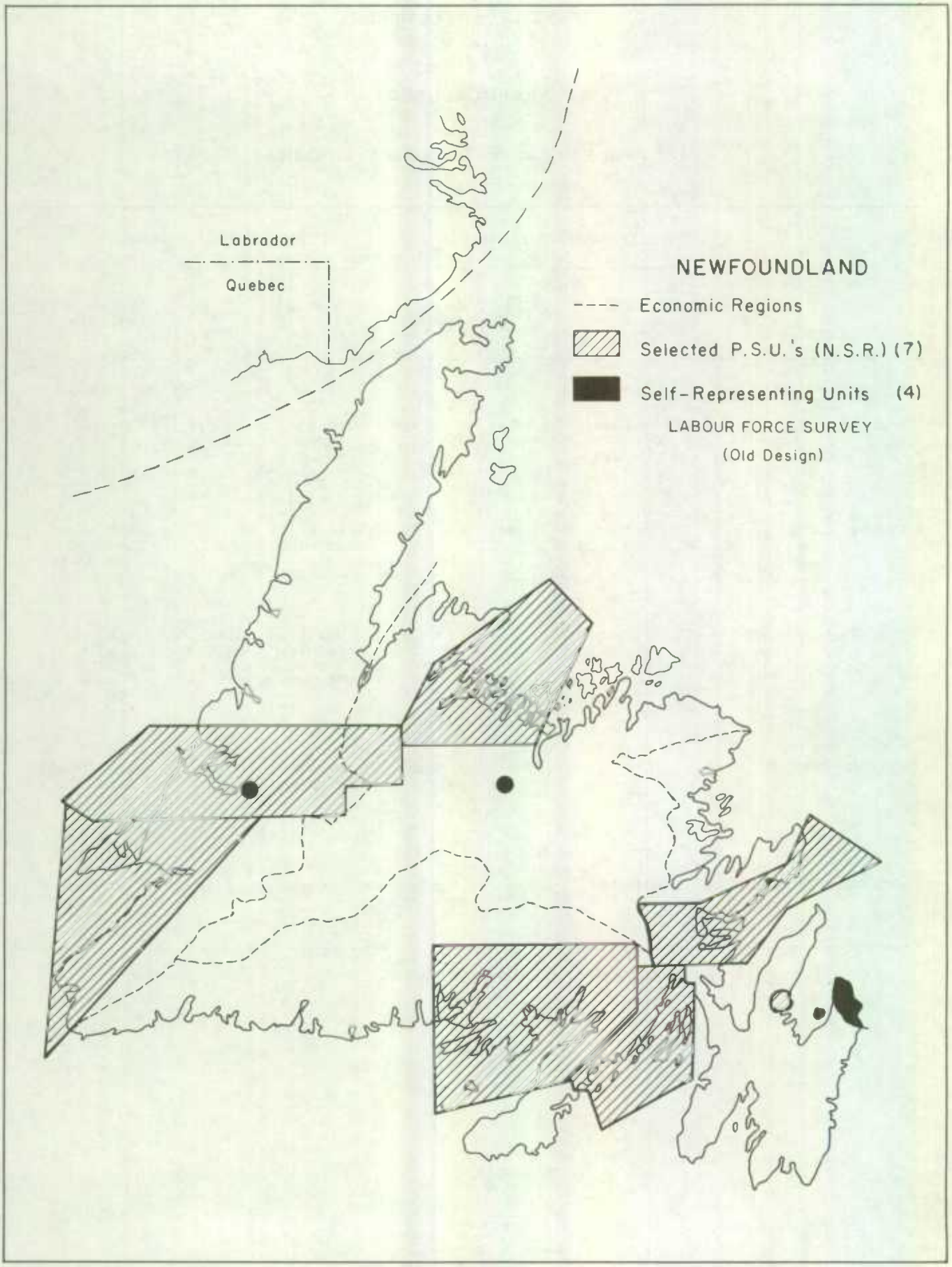
1. Labour Force Survey Design in Newfoundland

(sampling ratio 1.6%)

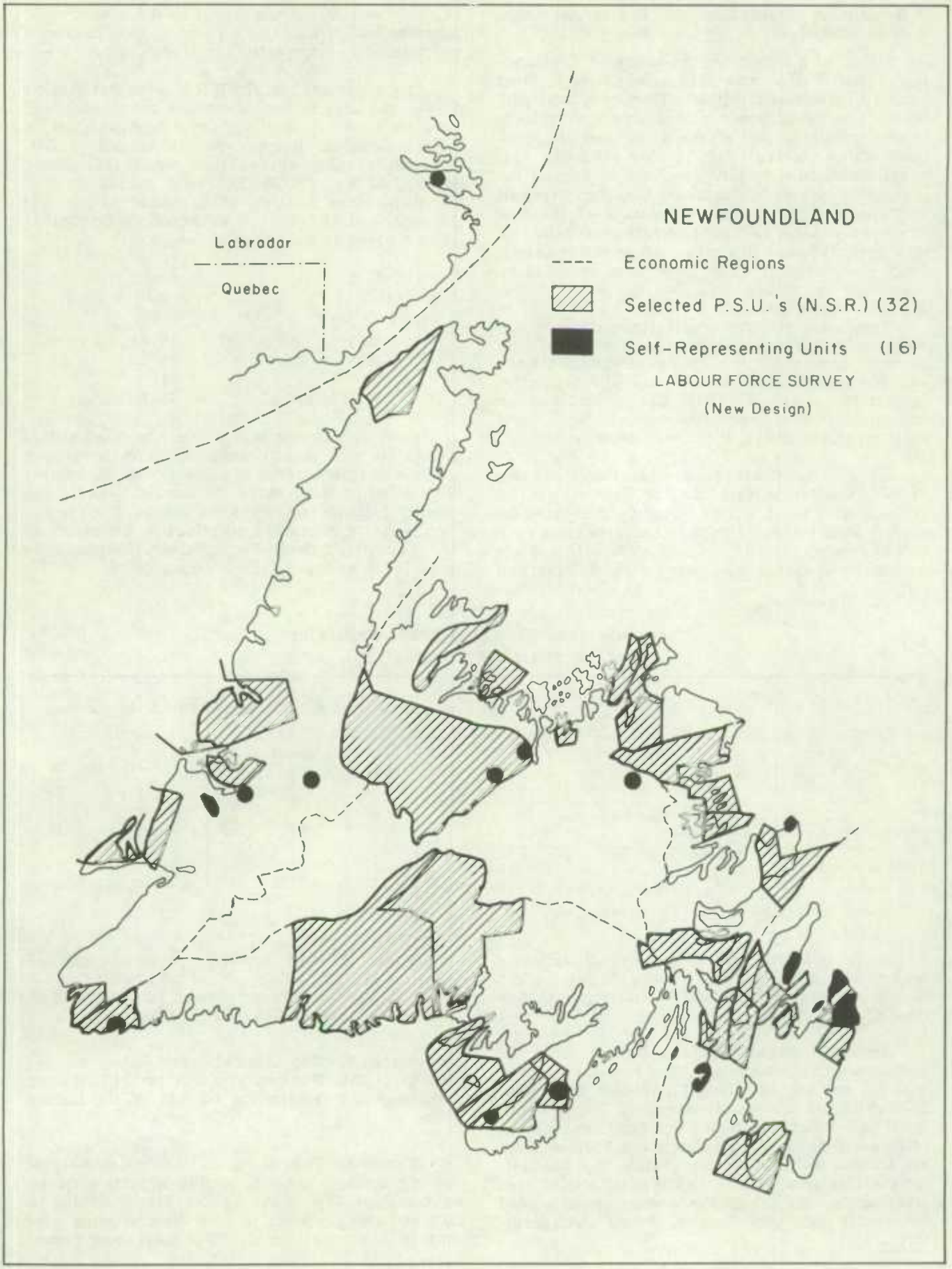
Stage of sampling	Self-representing areas			Non-self-representing areas		
	Nature of units	Size of units (pop.)	Method of selection	Nature of units	Size of units (pop.)	Method of selection
Stratum	Metropolitan area or special area	3,000 +	Certainty	Group of similar p.s.u.'s	10,204 - 23,390	Certainty
First stage	Census tracts (St. John's only)	15,000	Certainty	Rural enumeration areas	1,749 - 3,838	Two units selected with p.p.s.
Second stage (segment)	City block(s)		p.p.s.[1] systematic	Rural enumeration area or settlement	Rural 100 - 1000	Systematic p.p.s. within urban and rural
Third stage (cluster)	None	None	None	Mostly unclustered		Random systematic (p.p.s. for multiple clusters)
Fourth stage (household)	Household	4 - 5	Random systematic	Household	5 - 6	Random systematic in multiple clusters

[1] p.p.s. = Probability proportional to size (1961 Census population).

2


Labrador
Quebec
NEWFOUNDLAND
Economic Regions
Selected P.S.U.'s (N.S.R.) (7)
Self-Representing Units (4)
LABOUR FORCE SURVEY
(Old Design)

2


NEWFOUNDLAND
Labrador
Quebec
Economic Regions
Selected P.S.U.'s (N.S.R.) (32)
Self-Representing Units (16)
LABOUR FORCE SURVEY
(New Design)

3. Description of the Economic Region and Strata of Newfoundland

Owing to the geographical nature of Newfoundland, stratification was approached in a different manner to the other provinces. There is a large part of the interior of Newfoundland with very sparse, if any, population and no roads. In most areas the roads follow the coastline. In some areas the enumerator will have to travel by boat to contact the population which is clustered together in small settlements along the coast. Because of the type of area, it was not possible to obtain as satisfactory results with regards to the percentage of the Labour Force characteristics as have been required in most other provinces.

Population size for a self-representing unit in Newfoundland was permitted to be much lower than in other provinces to facilitate sampling. Sixteen self-representing units were formed with population ranging from 3,910 to 90,838. The remainder of the population, non-self-representing, was considered as all rural, eliminating the idea of urban completely.

Forestry and fishing are the two main industries in Newfoundland so these Labour Force characteristics were treated as two separate industries for stratification purposes. Primary sampling units were formed keeping in mind the population size and accessibility by road or boat. When a whole region had been delineated, primary sampling units were combined to form strata. The concept of contiguity was not adhered to in the formation of all strata.

It was decided that the D.D.P. Economic Region 00 was too large for possible future use in this province so it was divided into three parts which were called Economic Regions 00, 01 and 02. D.D.P. Economic Region 01 was then renamed Economic Region 03 and D.D.P. Economic Region 02 was given the identification of Economic Region 04. Labrador, which was D.D.P. Economic Region 03 is now known as Economic Region 05.

D.D.P. economic region No.	L.F. design economic region No.
00	00, 01, 02
01	03
02	04
03 (Labrador)	05 (Labrador)

Each economic region has been stratified separately and primary sampling units have been delineated independently of another economic region. The following table shows the number of strata and primary units for each economic region. The average population of strata (as described in the report on the Canadian Labour Force Survey (Methodology) page 10) was equal to 15,000 persons.

Newfoundland – Number of Economic Regions, Strata and P.S.U.'s

Economic region	Stratum 1	Stratum 2	Stratum 3	Stratum 4	Total in economic region
	number of P.S.U.'s				
00	6	5	5	–	10
01	5	4	4	7	20
02	6	6	5	–	17
03	6	8	7	–	21
04	7	6	6	–	19
05[1]	–	–	–	–	–
Total in province	–	–	–	–	93

[1] Self-representing unit and remote areas only.

In the following description of stratification of each region, in the majority of cases the percentages of the three most important characteristics have been given.

Economic Region 00 is a portion along the south coast of Newfoundland, from Port-aux-Basques east to, but not including, the Avalon Peninsula. It consists of census divisions 2, 3 and a very small part of division 1. The self-representing units of Port-aux-Basques, Marystown, and Fortune Town are located in this economic region. The non-self-representing population is 33,926 which was divided into 3 strata. The Labour Force characteristics used for stratification were forestry, fishing and agriculture.

Stratum 1. – The non-self-representing population is 12,517. The largest part of the Labour Force – 41% is engaged in fishing, services accounts for 24% and manufacturing non-durable for 16%.

Stratum 2. – The non-self-representing population is 11,205. Services accounts for 31%, fishing for 28% and transportation for 13% of the Labour Force.

Stratum 3. – Population in the non-self-representing areas is 10,204. In this stratum services accounts for 29% of the Labour Force, fishing is 22% and transportation is 16%. Manufacturing non-durable is worth noting at 15% of the Labour Force.

Economic Region 01 is the Avalon Peninsula which is the south-east corner of Newfoundland. It consists of most of census division 01. The self-representing units of St. John's, Bell Island, Portugal Cove, Carbonear and Placentia are located within this region. The non-self-representing population total is 63,230 which was divided into 4 strata. The Labour Force characteristics used for stratification purposes were forestry, fishing and agriculture.

Stratum 1. – The non-self-representing population is 12,400. Services accounts for 41% of the Labour Force while fishing, transportation and manufacturing non-durable each take 14%.

Stratum 2. – It has a non-self-representing population of 13,356. The main type of industry is services with 47% of the Labour Force. Next is construction with 20% and transportation with 14%. Agriculture is worth noting with 7% of the Labour Force.

Stratum 3. – It has a non-self-representing population of 14,084. Services accounts for 44%, construction 19% and transportation 18% of the Labour Force. There is some agriculture – enough to occupy 5% of the Labour Force.

Stratum 4. – It has a non-self-representing population of 23,390. The largest part of the Labour Force – 41% – is engaged in services. Construction has 19%, transportation 13% and fishing 11% of the Labour Force.

Economic Region 02 is on the east coast of Newfoundland, just north of the Avalon Peninsula. It consists of all of census division 7 and a small part of census division 1. The self-representing unit of Bonavista is located within this economic region. The total non-self-representing population is 38,093 which was divided into 3 strata. The Labour Force characteristics used for stratification were forestry, fishing and agriculture.

Stratum 1. – It has a non-self-representing population of 13,737. Services accounts for 35%, transportation 19% and forestry 13% of the Labour Force.

Stratum 2. – The non-self-representing population of this stratum is 13,329. The largest part of the Labour Force – 32% – is engaged in services, fishing is next with 27% and transportation is 14%.

Stratum 3. – It has a non-self-representing population of 11,027. Services is the dominant characteristic with 32% of the Labour Force engaged in it. Forestry runs a close second with 28% and transportation and construction each have 12%.

Economic Region 03 is more or less the central portion of Newfoundland and extends east to the Atlantic coast. It consists of census divisions 6 and 8. The three self-representing units of Bishop's Falls, Gander and Windsor – Grand Falls are located in Economic Region 03. The non-self-representing population total is 56,492 which was divided into 3 strata. The Labour Force characteristics used for stratification purposes were forestry, fishing, services and transportation. There is some mining in this region – enough that a stratum was formed with this as the major characteristic.

Stratum 1. – It has a non-self-representing population total of 15,053. Mining accounts for 32%, services 30% and forestry 15% of the Labour Force.

Stratum 2. – The non-self-representing population total is 22,285. Forestry is the dominant characteristic with 37% of the Labour Force engaged in it. Services is next with 30% and transportation is third with 10%.

Stratum 3. – It has a non-self-representing population total of 19,154. Services accounts for 38%, fishing 20% and transportation 19% of the Labour Force.

Economic Region 04 is the western part of Newfoundland. It is a long, narrow strip that runs north and south and is made up of census divisions 4, 5 and 9. The self-representing units of Deer Lake, Stephenville and Cornerbrook are located within this economic region. The total non-self-representing population is 45,199 which was divided into 3 strata. The Labour Force characteristics used for stratification were forestry, fishing and services.

Stratum 1. – It has a non-self-representing population total of 17,482. Forestry accounts for 30%, services for 28% and transportation for 14% of the Labour Force.

Stratum 2. – The non-self-representing population total of this stratum is 13,643. Fishing is the main industry, accounting for 54% of the Labour Force, next is services with 26% and forestry with 10%.

Stratum 3. – It has a non-self-representing population total of 14,074. Services accounts for 41%, fishing and construction are both 11% and forestry is 10% of the Labour Force.

Economic Region 05 is Labrador and is across the Strait of Belle Isle from the rest of Newfoundland. Its southern and western boundary is the province of Quebec. Census division 10 is the part of Newfoundland known as Labrador. The self-representing unit of Goose Bay is located within this region. The remainder of the population will be sampled as a Special Remote Area.

4. Special Features

(a) Some deviation from D.D.P. Economic Regions was necessary (See page 40).

(b) The minimum size requirement for self-representing units was lowered to include towns of approximately 4,000 population and over.

(c) There is no rural-urban stratification in the non-self-representing units as the population is almost entirely in small settlements.

(d) Labour Force characteristics of forestry and fishing were used separately for stratification purposes. In most other provinces they were combined.

(e) Primary sampling units were formed and then combined to form strata within the economic region. Strata consist of contiguous primary sampling units where possible, however, some deviation from contiguity was necessary due to the unusual clustering of the population.

(f) Primary sampling units and strata are much smaller than in other provinces due to the extreme limitation of enumerator travel.

(g) Military establishments are not sampled as special areas but are included in the regular sample. The only military establishments of any size are in Goose Bay, Labrador and are sampled as part of the self-representing-unit of Goose Bay.

5. Self-representing Units in Newfoundland (Total 16)

Economic region		Population
00	Port-aux-Basques	5,532
	Marystown	4,930
	Fortune	4,063
01	St. John's	87,940
	Bell Island	12,281
	Portugal Cove	3,910
	Carbonear	8,840
	Placentia	5,050
02	Bonavista	5,941
03	Bishop's Falls	7,987
	Gander	5,896
	Windsor-Grand Falls	12,110
04	Deer Lake	3,998
	Stephenville	10,512
	Cornerbrook	24,933
05	Goose Bay	4,326

PRINCE EDWARD ISLAND

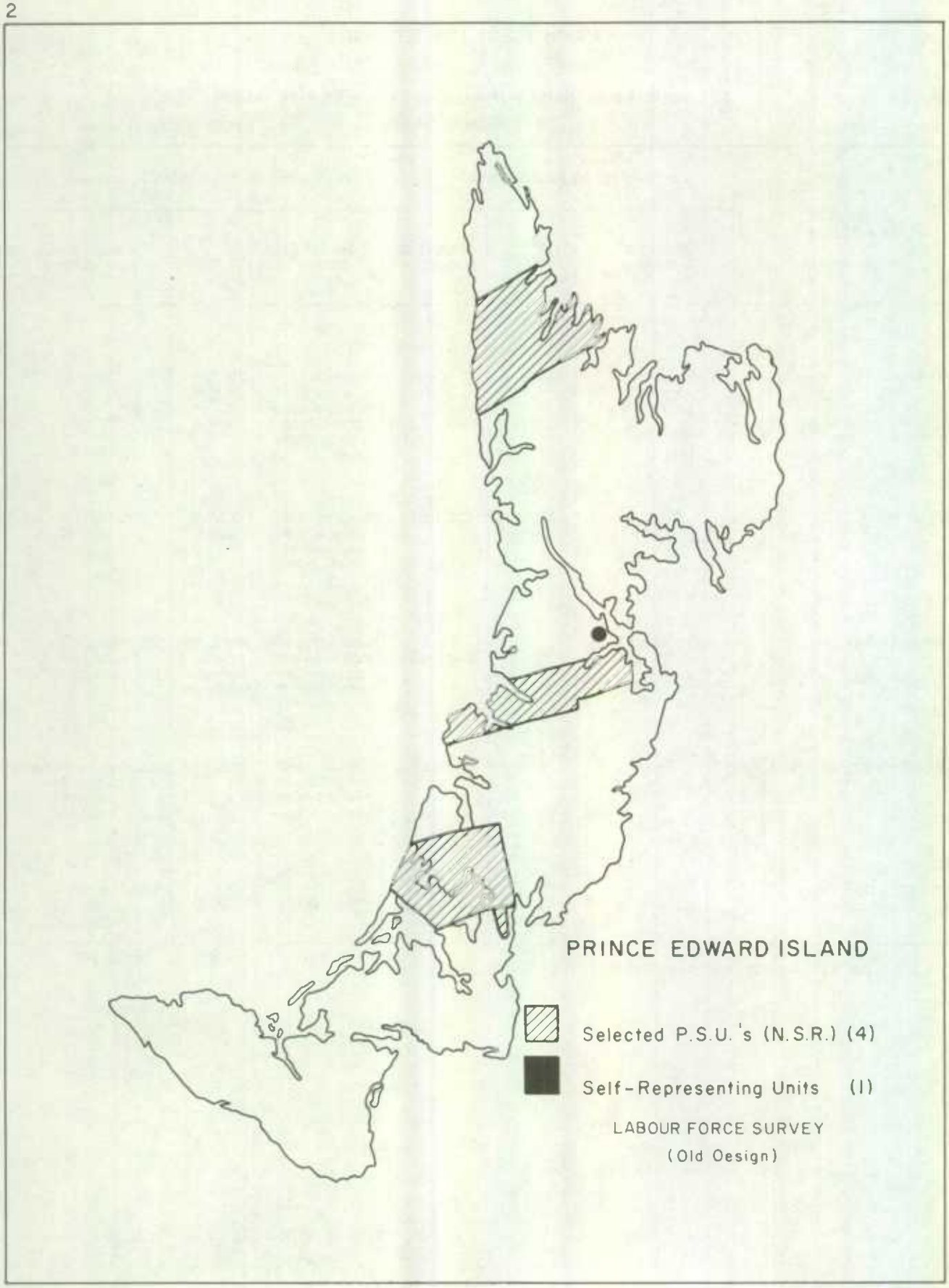
1. Labour Force Survey Design in Prince Edward Island

(sampling ratio 1.6%)

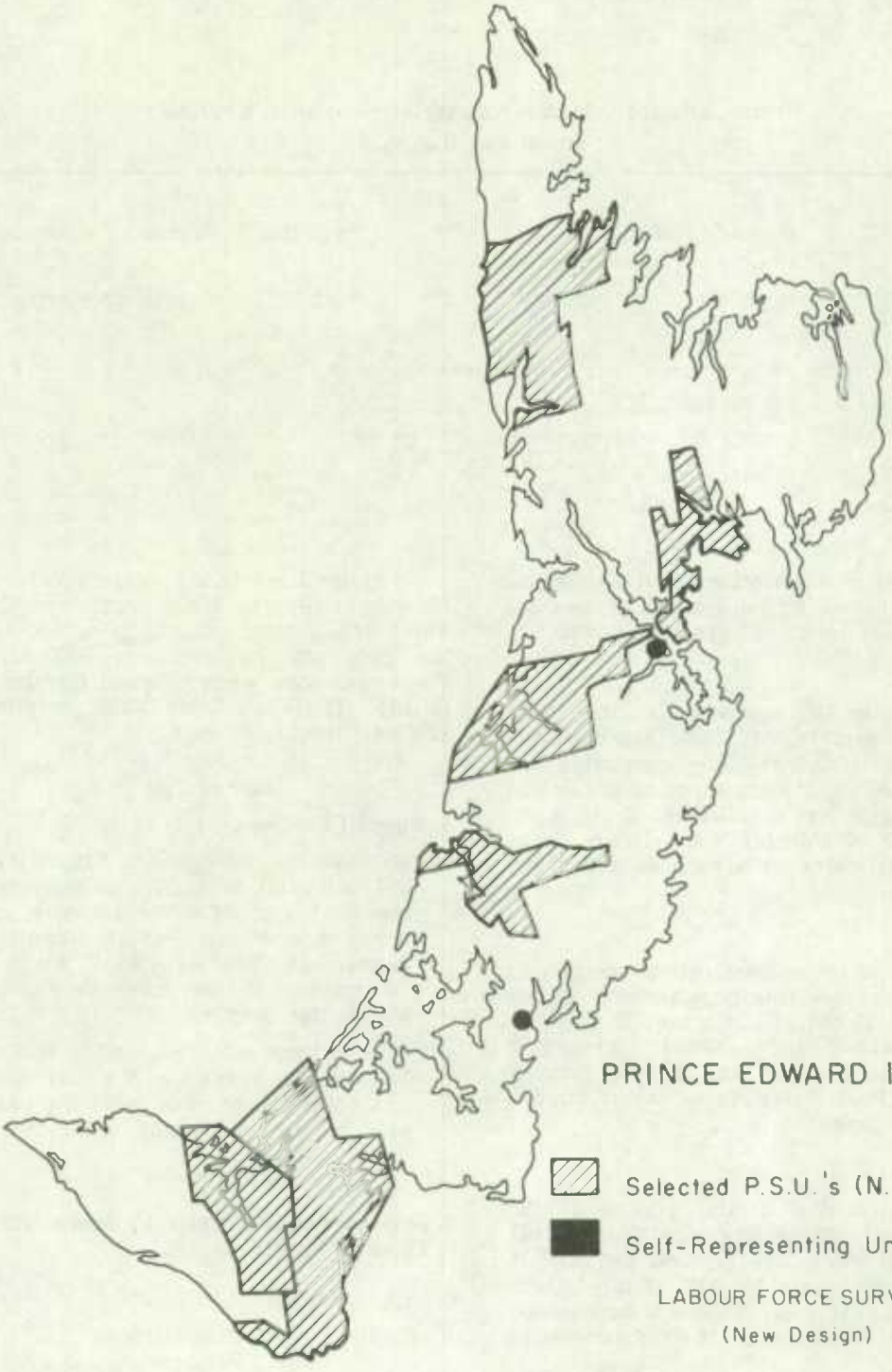
Stage of sampling	Self-representing areas			Non-self-representing areas		
	Nature of units	Size of units (pop.)	Method of selection	Nature of units	Size of units (pop.)	Method of selection
Stratum	Metropolitan area or special area	15,000 +	Certainty	Group of similar p.s.u.'s (geographically contiguous)	18,773 - 29,036	Certainty
First stage	Census tracts	15,000	Certainty	Rural enumeration areas and nearby small urban	2,432 - 3,884	Two units selected with p.p.s.
Second stage (segment)	City block (s)		p.p.s.[1] systematic	Rural enumeration area and small urban or part of it	Rural 500 Urban approximately 300	Systematic p.p.s. within urban and rural
Third stage (cluster)	None	None	None	Small area with recognizable boundaries	Multiple of 3 or 4 H.H.'s	Random systematic (p.p.s. for multiple clusters)
Fourth stage (household)	Household	4 - 5	Random systematic	Household	4 - 5	Random systematic in multiple clusters

[1] p.p.s. = probability proportional to size (1961 Census population).

2


PRINCE EDWARD ISLAND
Selected P.S.U.'s (N.S.R.) (4)
Self-Representing Units (1)
LABOUR FORCE SURVEY
(Old Oesign)

2


PRINCE EDWARD ISLAND
Selected P.S.U.'s (N.S.R.) (6)
Self-Representing Units (2)
LABOUR FORCE SURVEY
(New Design)

3. Description of the Economic Region and Strata of Prince Edward Island

The economic region has been stratified and primary sampling units have been delineated. The following table shows the number of strata and primary units. The average population of strata (as described in the report on the Canadian Labour Force Survey (Methodology) page 10) was equal to 25,000 persons.

Prince Edward Island – Number of Economic Regions, Strata and P.S.U.'s

Economic region	Stratum 1	Stratum 2	Stratum 3	Total in economic region
	number of P.S.U.'s			
10	10	8	6	24
Total in province	–	–	–	**24**

In the following description of stratification, in the majority of cases the percentages of the three most important characteristics have been given.

Economic Region 10 comprises all of the Province of Prince Edward Island. There are two self-representing units in the region – Summerside and Charlottetown. The non-self-representing population is 75,359. The region was divided into 3 strata according to "Type of Farming" and "Farm Sales Value" (commercial farms only were used in these calculations).

Stratum 1. – It is the eastern part of the island. It has a non-self-representing population of 27,550 of which 79% is rural and 21% is urban. The largest portion of the Labour Force – 36% is engaged in agriculture, 28% in services and 13% in forestry and fishing. The Farm Sales Value in the stratum is near the $2,900 mark.

Stratum 2. – It is the central portion of the island. The non-self-representing population in this area is 29,036 of which 73% is rural and 27% is urban. Agriculture accounts for 41% of the Labour Force, services is next with 34% and transportation is 9%. The Farm Sales Value in this stratum is about $4,000.

Stratum 3. – It is the western part of the island. Its non-self-representing population is 18,773 of which 85% is rural and 15% is urban. Agriculture is the main industry, engaging 38% of the Labour Force, services takes 29% and forestry and fishing is 14%. The Farm Sales Value in this stratum is just over the $2,500 mark.

4. Special Features

(a) Because Special Areas in Prince Edward Island did not exist in sufficient numbers to warrant the setting up of a Special Area stratum, enumeration areas that would normally have been sampled as "Special Areas", for example Institutions and Hotels, have been integrated into the regular sample.

(b) The military establishment of R.C.A.F. Station Summerside, which was the only special area of any consequence, was made a primary sampling unit within Summerside self-representing unit.

5. Self-representing Units in Prince Edward Island (Total - 2)

Economic Region		Population
10	Charlottetown	18,318
	Summerside	8,611

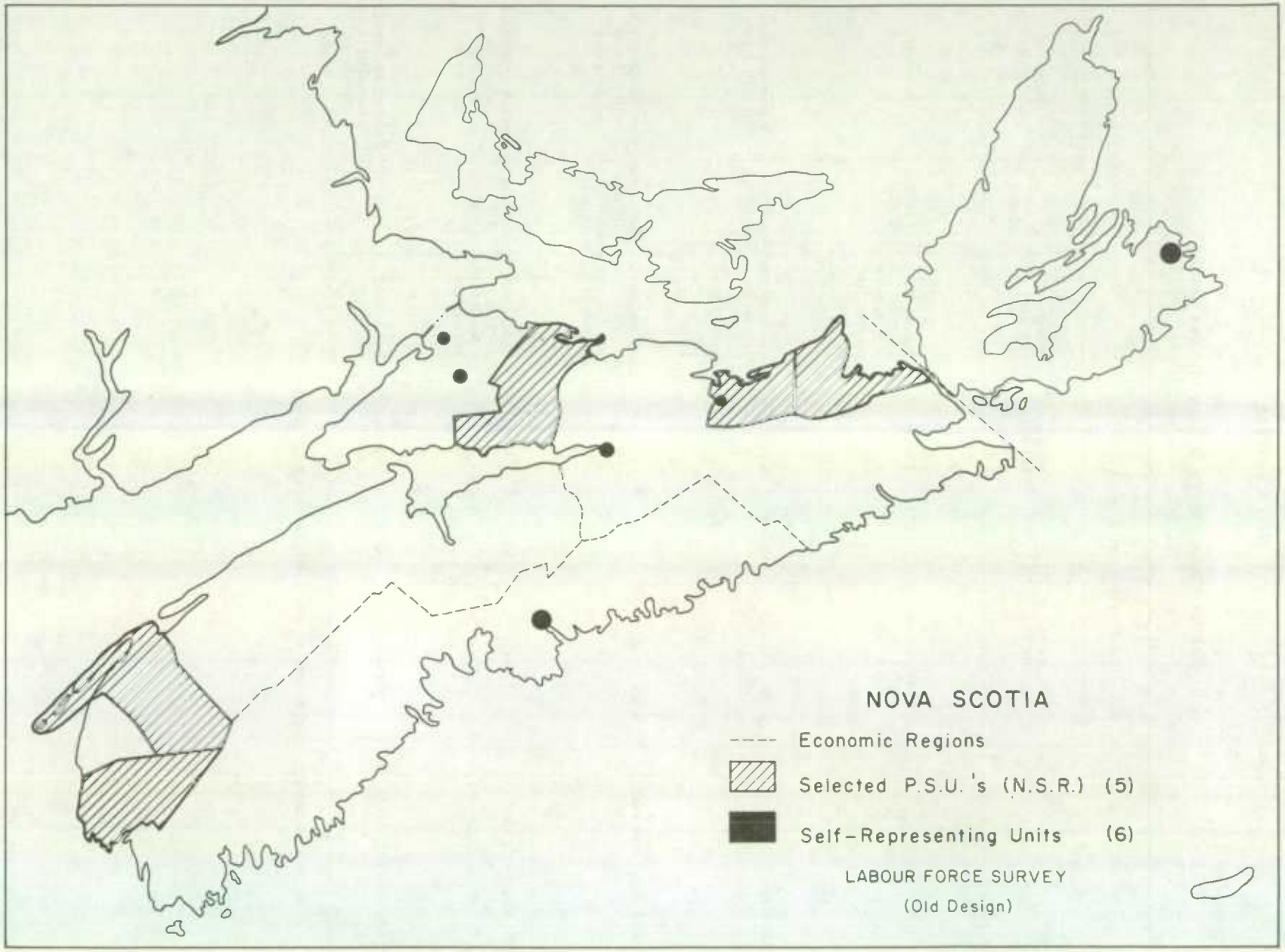
NOVA SCOTIA

1. Labour Force Survey Design in Nova Scotia

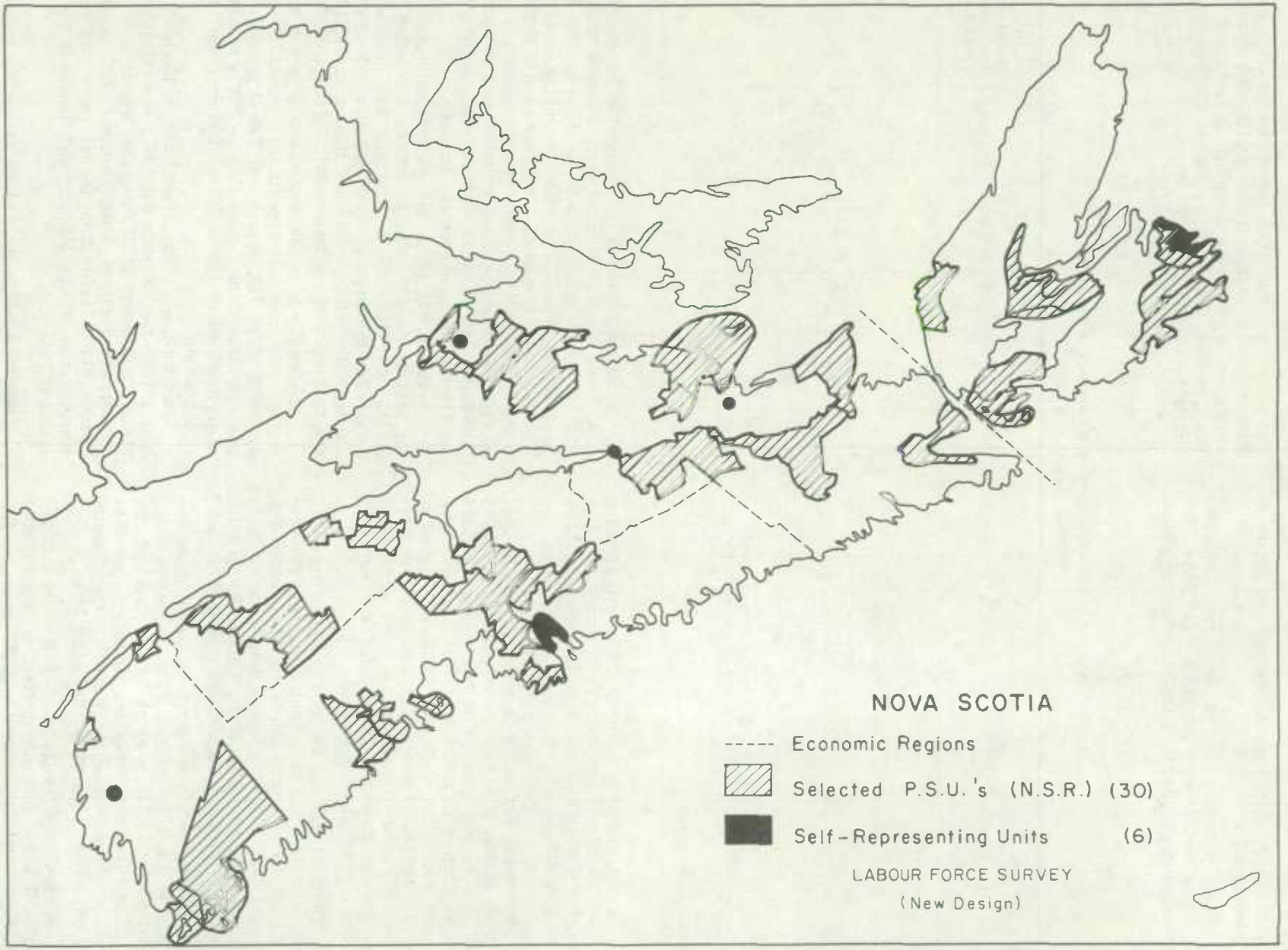
(sampling ratio 1.6%)

Stage of sampling	Self-representing areas			Non-self-representing areas		
	Nature of units	Size of units (pop.)	Method of selection	Nature of units	Size of units (pop.)	Method of selection
Stratum	Metropolitan area or special area	10,000+	Certainty	Group of similar p.s.u.'s (geographically contiguous)	14,420-35,039	Certainty
First stage	Census tracts	18,000	Certainty	Rural enumeration areas and nearby small urban	1,889-4,398	Two units selected with p.p.s.
Second stage (segment)	City block(s)		p.p.s.[1] systematic	Rural enumeration area and small urban or part of it	Rural 600 Urban approximately 400	Systematic p.p.s. within urban and rural
Third stage (cluster)	None	None	None	Small area with recognizable boundaries	Multiple of 3 or 4 H.H.'s	Random systematic (p.p.s. for multiple clusters)
Fourth stage (household)	Household	4-5	Random systematic	Household	4-5	Random systematic in multiple clusters

[1] p.p.s. = Probability proportional to size (1961 Census population).


NOVA SCOTIA
Economic Regions
Selected P.S.U.'s (N.S.R.) (5)
Self-Representing Units (6)
LABOUR FORCE SURVEY
(Old Design)

2


NOVA SCOTIA
Economic Regions
Selected P.S.U.'s (N.S.R.) (30)
Self-Representing Units (6)
LABOUR FORCE SURVEY
(New Design)

3. Description of Economic Regions and Strata of Nova Scotia

Each economic region has been stratified separately and primary sampling units have been delineated independently of another economic region.

The following table shows the number of strata and primary units of each economic region. The average population of strata (as described in the report on the Canadian Labour Force Survey (Methodology) page 10) was equal to 25,000 persons.

Nova Scotia – Number of Economic Regions, Strata and P.S.U.'s

Economic region	Stratum 1	Stratum 2	Stratum 3	Stratum 4	Stratum 5	Total in economic region
	number of P.S.U.'s					
20	4	7	7	–	–	18
21	7	7	6	8	–	28
22	10	7	8	9	10	44
23	9	9	9	–	–	27
Total in province	–	–	–	–	–	**117**

In the following description of stratification of each Region in the majority of cases, the percentages of the three most important characteristics have been given.

Economic Region 20 is the north-eastern part of Nova Scotia. It is made up of counties 3, 10, 15 and 17. The self-representing unit of Sydney-Glace Bay is located in this region. The non-self-representing population of Region 20 is 61,605 and it was divided into 3 strata. The Labour Force characteristics used in stratification were agriculture, forestry and fishing, transportation and services. Mining is heavy in certain areas.

Stratum 1. – It is an area around Glace Bay Urbanized Area and is a mining district. The non-self-representing population is 15,753 of which 63% is rural and 37% is urban. Services is the main industry, engaging 40% of the Labour Force while mining and manufacturing are next with 17% each.

Stratum 2. – It runs north to south down the centre of the region. It has a non-self-representing population of 22,778 of which 74% is rural and 26% is urban. The most important industry is services which engages 36% of the Labour Force, forestry and fishing has 21% and transportation 13%.

Stratum 3. – It is the south-western part of the region. It has a non-self-representing population of 23,074 of which 74% is rural and 26% is urban. The largest portion of the Labour Force – 34% is engaged in services, with 14% in agriculture and 13% in transportation. Forestry and fishing is worth noting in this area.

Economic Region 21 is composed of counties 2, 4, 5, 7 and 13. It is situated along the New Brunswick boundary and runs east to the coastline to Cape Breton Island. The self-representing units of Amherst, New Glasgow and Truro are located in this region. The non-self-representing population is 93,114. Labour Force characteristics used to divide this region into 4 strata were agriculture, forestry and fishing, transportation and services.

Stratum 1. – It is in the north-eastern part of the region. Its non-self-representing population is 23,167 of which 72% is rural and 28% is urban. Services is the major industry engaging 41% of the Labour Force with forestry and fishing having 17% and manufacturing and transportation each with 13%.

Stratum 2. – It is the south-eastern part of the region. Its non-self-representing population is 22,795 of which 71% is rural and 29% is urban. The largest portion of the Labour Force – 36% is engaged in services, while 19% is in manufacturing and 17% in agriculture.

Stratum 3. – It is the central part of Region 21. It is a 100% rural stratum and has a non-self-representing population of 22,020. The largest type of industry is services which engages 32% of the Labour Force, agriculture is next with 21% and manufacturing is 15%. Forestry and fishing is worth noting at 13%.

Stratum 4. – It is the western part of the region. It has a non-self-representing population of 25,132 which is 55% rural and 45% urban. In this stratum, services accounts for 43%, agriculture 15% and manufacturing 12% of the Labour Force.

Economic Region 22 is the south-western quarter of the Province of Nova Scotia. Its boundaries on the north-west are the Bay of Fundy and on the south the Atlantic Ocean. It is made up of counties 6, 8, 12, 14, 16 and 18 and includes Sable Island. The self-representing units of Halifax Metropolitan Area and Yarmouth-Digby Area are situated within this economic region. The Yarmouth-Digby Area is a new self-representing unit. The total non-self-representing population is 136,777 which is divided into 5 strata. The main Labour Force characteristics used for stratification were forestry and fishing, manufacturing and services. Owing to the special nature of this economic region, it was decided in certain areas that the requirement of contiguity would be relaxed. Consequently, strata 2, 3 and 5 do not follow the rule of absolute contiguity.

Stratum 1.—It is the area surrounding the city of Halifax. The non-self-representing population is 33,983 and it is 100% rural. The main type of industry is services which is 49% of the Labour Force, manufacturing is next with 16% and transportation has 14%.

Stratum 2.—It is the most westerly part of the region. The non-self-representing population is 14,420 which is 100% rural. Services is the main type of occupation with 41% of the Labour Force engaged in it. Manufacturing is 18% and transportation is 12%.

Stratum 3.—It is made up of two areas which are high in forestry and fishing. The total non-self-representing population is 23,504 and it is 100% rural. Services takes 32% of the Labour Force with forestry and fishing 23% and manufacturing 13%.

Stratum 4.—It is in the westerly part of the economic region. The non-self-representing population total is 29,831 and it is 100% rural. Forestry and fishing is a major industry in this area as it engages 31% of the Labour Force. Services is high with 31% and manufacturing employs 20%.

Stratum 5.—It is in the central part of the economic region. The non-self-representing population is 35,039 of which 46% is rural and 54% is urban. The main type of industry is services which is 43% of the Labour Force, manufacturing is 29% and transportation is 10%.

Economic Region 23 is the Annapolis Valley area. It is made up of counties 1, 9 and 11 and has a total population of 83,252 which was divided into 3 strata. The Labour Force categories used for stratification were agriculture, manufacturing and services.

Stratum 1.—It is the eastern portion of Region 23. The non-self-representing population total of 25,930 of which 78% is rural and 22% is urban. Services takes 39% of the Labour Force, manufacturing takes 15% and agriculture takes 13%.

Stratum 2.—It is the western part of the region. The non-self-representing population is 28,577 of which 81% is rural and 19% is urban. Services accounts for 49% of the Labour Force, agriculture 15% and manufacturing 11%.

Stratum 3.—It is the centre of the region. The non-self-representing population is 28,745 of which 62% is rural and 38% is urban. The largest portion of the Labour Force—49% is engaged in services, agriculture has 19% of the Labour Force and manufacturing has 13%.

4. Special Features

Due to the higher sampling ratio (1.6%) the minimum size of the self-representing unit was lowered from 15,000 to approximately 10,000.

5. Self-representing Units in Nova Scotia (Total - 6)

Economic region		Population
20	Sydney - Glace Bay	106,114
21	New Glasgow	22,408
	Truro	15,869
	Amherst	10,788
22	Halifax	183,946
	Yarmouth - Digby	10,944

NEW BRUNSWICK

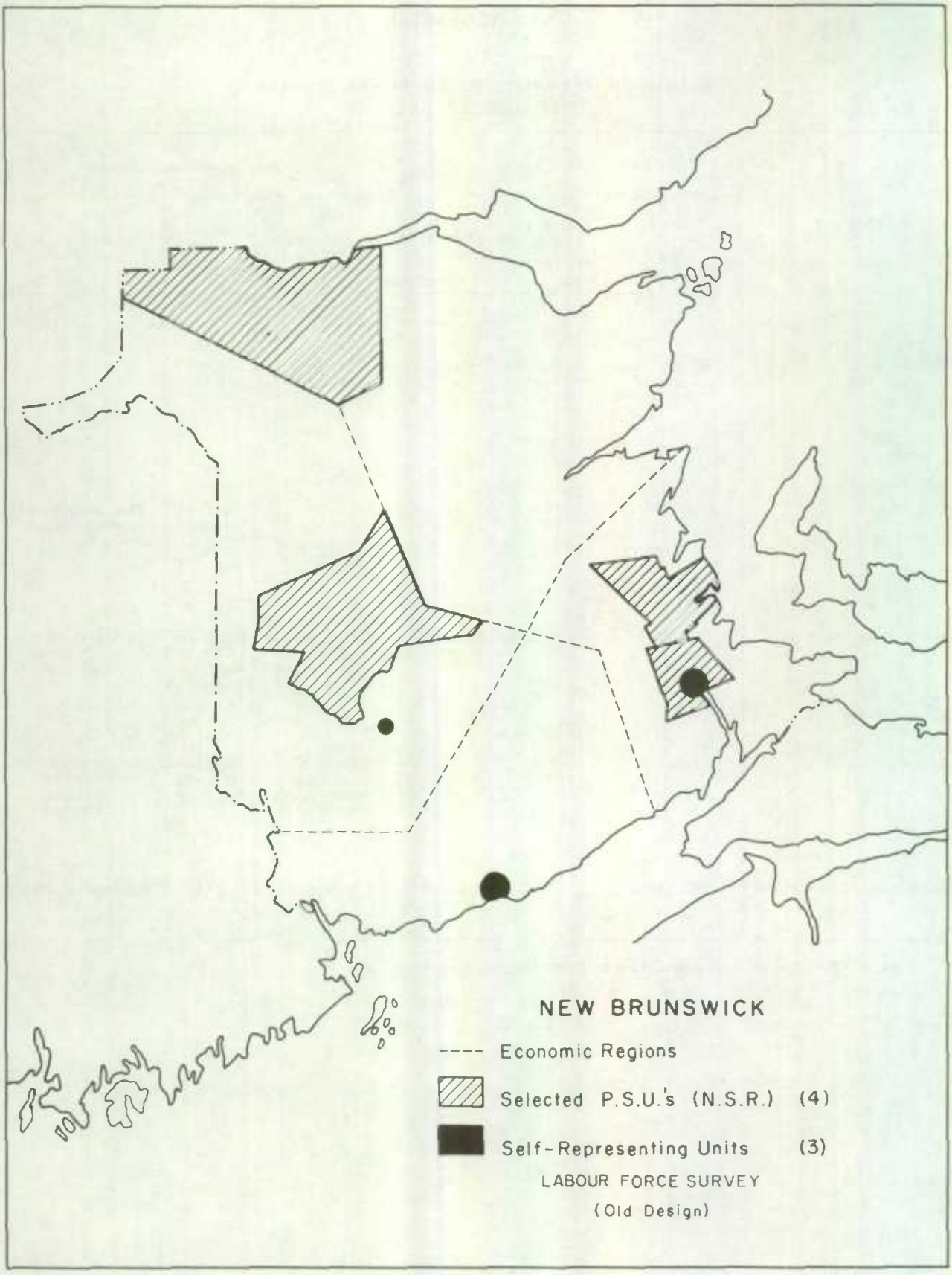
1. Labour Force Survey Design in New Brunswick

(sampling ratio 1.6%)

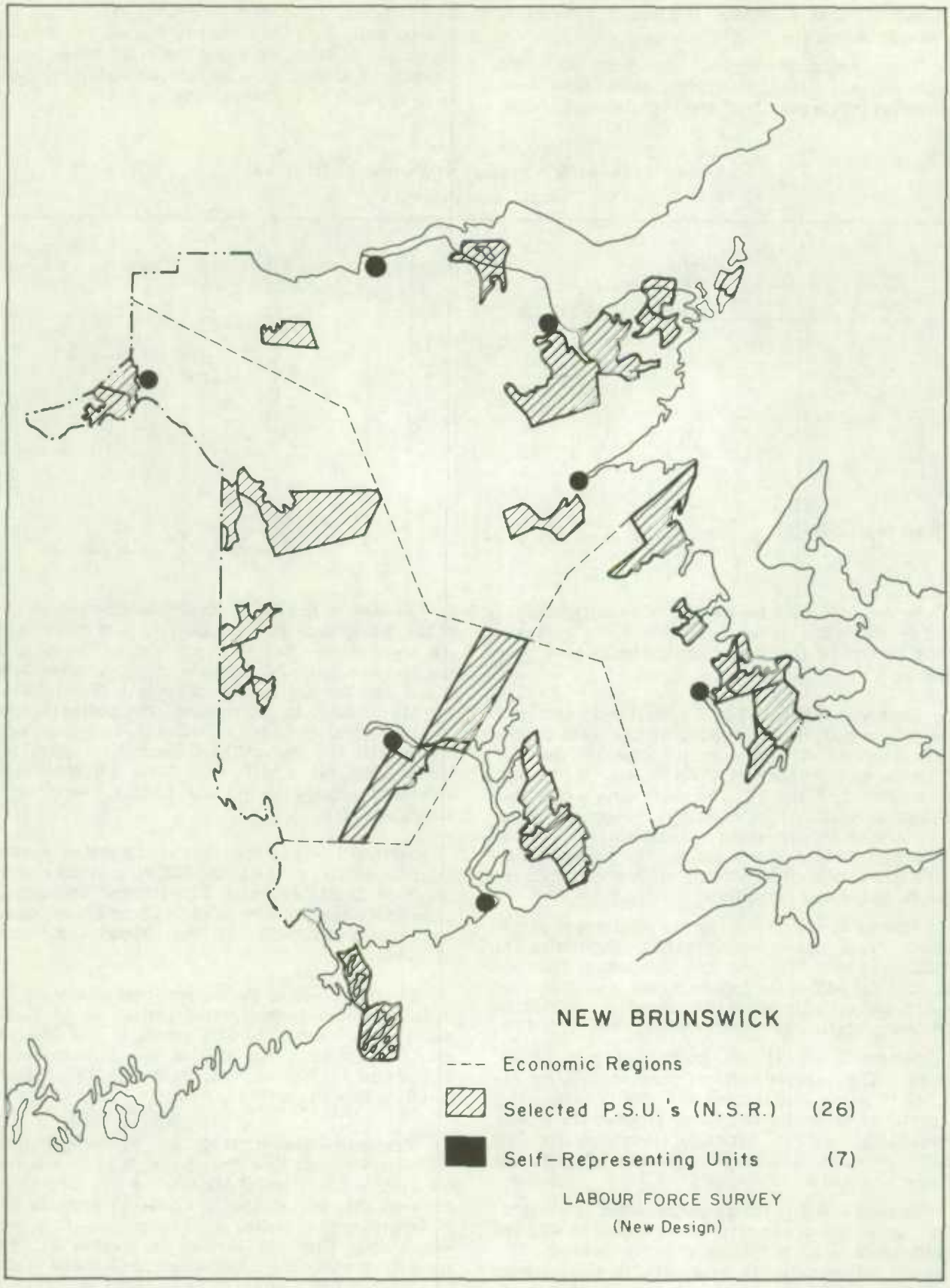
Stage of sampling	Self-representing areas			Non-self-representing areas		
	Nature of units	Size of units (pop.)	Method of selection	Nature of units	Size of units (pop.)	Method of selection
Stratum	Metropolitan area or special area	10,000 +	Certainty	Group of similar p.s.u.'s (geographically contiguous)	21,049 - 31,677	Certainty
First stage	Census tracts	18,000	Certainty	Rural enumeration areas and nearby small urban	2,250 - 4,668	Two units selected with p.p.s.
Second stage (segment)	City block(s)		p.p.s.[1] systematic	Rural enumeration area and small urban or part of it	Rural 600 Urban approximately 400	Systematic p.p.s. within urban and rural
Third stage (cluster)	None	None	None	Small area with recognizable boundaries	Multiple of 3 or 4 H.H.'s	Random systematic (p.p.s. for multiple clusters)
Fourth stage (household)	Household	4 - 5	Random systematic	Household	4 - 5	Random systematic in multiple clusters

[1] p.p.s. = Probability proportional to size (1961 Census population).

2


NEW BRUNSWICK
Economic Regions
Selected P.S.U.'s (N.S.R.) (4)
Self-Representing Units (3)
LABOUR FORCE SURVEY
(Old Design)

2


NEW BRUNSWICK
Economic Regions
Selected P.S.U.'s (N.S.R.) (26)
Self-Representing Units (7)
LABOUR FORCE SURVEY
(New Design)

3. Description of Economic Regions and Strata of New Brunswick

Each economic region has been stratified separately and primary sampling units have been delineated independently of another economic region.

The following table shows the number of strata and primary units for each economic region. The average population of strata (as described in the report on the Canadian Labour Force Survey (Methodology) page 10) was equal to 27,000 persons.

New Brunswick – Number of Economic Regions, Strata and P.S.U.'s

Economic region	Stratum 1	Stratum 2	Stratum 3	Stratum 4	Total in economic region
	number of P.S.U.'s				
30	7	7	7	–	21
31	6	10	–	–	16
32	10	10	6	7	33
33	6	9	9	–	34
Total in province	–	–	–	–	**104**

In the following description of stratification of each region in the majority of cases the percentages of the three most important characteristics have been given.

Economic Region 30 is the south-east corner of New Brunswick. It is bounded on the east by the Northumberland Strait and on the south by the Bay of Fundy and province of Nova Scotia. It consists of counties 1, 5 and 14. The self-representing unit of Moncton City is located in this economic region. The non-self-representing population is 74,994 which was divided into 3 strata. The Labour Force characteristics used for stratification were services, manufacturing and agriculture.

Stratum 1. – It runs along the east coast of the region. The non-self-representing population is 31,225 which is 78% rural and 22% urban. Services accounts for 34% of the Labour Force, manufacturing is 23% and agriculture is 12%. Forestry and fishing and transportation are worth noting, each with 11%.

Stratum 2. – It is the north-west part of the region. The non-self-representing population is 21,049 of which 71% is rural and 29% is urban. The largest part of the Labour Force population – 37% is engaged in services, agriculture accounts for 20% and transportation for 14%. Forestry and fishing should be noted at 13%.

Stratum 3. – It is the southern part of the region. The non-self-representing population is 22,720 which is made up of 64% rural and 36% urban. The category of services is very high in this stratum with 49% of the Labour Force engaged in this field. Manufacturing is 18% of the Labour Force and transportation is 13%.

Economic Region 31 is the south-western part of the province of New Brunswick. It is bounded on the south by the Bay of Fundy and on the west by the State of Maine. It is made up of counties 3, 6, 9 and 11. The self-representing unit of Saint John City is situated in this region. The non-self-representing population is 54,512 and this has been divided into two strata. The Labour Force characteristics used for stratification were manufacturing, agriculture and forestry and fishing. Services is also significant.

Stratum 1. – It is that part of the region west of Saint John City. It has a non-self-representing population of 23,883 of which 61% is rural and 39% is urban. Services has 37% of the Labour Force, manufacturing is next with 28% and forestry and fishing has 16%.

Stratum 2. – It is the eastern part of the region. It has a non-self-representing population of 30,629 which is 72% rural and 28% urban. In this stratum, services accounts for 35% of the Labour Force, agriculture is 20% and manufacturing 13%. Transportation is worth noting.

Economic Region 32 is the mid-western part of the province of New Brunswick. It is bounded on the west by the State of Maine. The counties which make up this region are 2, 7, 12, 13 and 15. The self-representing units of Fredericton City and Edmundston City are located in Region 32. The non-self-representing population is 107,368 which was divided into 4 strata. The Labour Force characteristics used for stratification were agriculture, forestry and fishing, transportation and services.

Stratum 1.—It is across the south and half way up the eastern part of Region 32. The non-self-representing population of this stratum is 30,550 of which 67% is rural and 33% is urban. The category of services accounts for 44% of the Labour Force, transportation is 16% and forestry and fishing is 11%.

Stratum 2.—It is north of stratum 1. Its non-self-representing population is 31,677 of which 81% is rural and 19% is urban. Services takes 36% of the Labour Force, agriculture 26% and transportation is 12%.

Stratum 3.—It is north of stratum 2. The non-self-representing population is 22,018 of which 65% is rural and 35% is urban. A large part of the Labour Force—38%, is engaged in services, 26% is engaged in agriculture and 11% is in transportation.

Stratum 4.—It is the extreme north-west portion of economic region 32. The total non-self-representing population is 23,123 which is 69% rural and 31% urban. This is an area where forestry is a major occupation. Industries under services take 32% of the Labour Force, forestry and fishing take 26% and agriculture take 15%.

Economic Region 33 is bounded on the north by the Gaspé Peninsula and the Baie of Chaleurs, on the east by the Gulf of St. Lawrence, on the south by Region 30 and on the west by Region 32. It is made up of counties 4, 8 and 10. The self-representing units of Campbellton-Dalhousie, Bathurst and Newcastle-Chatham are located within this region. The non-self-representing population total is 111,164 which was divided into 4 strata. The Labour Force characteristics used for stratification purposes were services, forestry and fishing and manufacturing.

Stratum 1.—It is the piece of land and islands that jut out into the Baie of Chaleur and Gulf of St. Lawrence. The total non-self-representing population total is 22,632 of which 73% is rural and 27% is urban. The main type of industry is services which accounts for 37% of the Labour Force, forestry and fishing is next with 22% and manufacturing is 22%.

Stratum 2.—It is the south-east part of Region 33. Its total non-self-representing population is 28,366 which is 100% rural. Forestry and fishing is the main type of industry as it accounts for 39% of the Labour Force. Services is 31% and manufacturing is 10%.

Stratum 3.—It is the south-west portion of this region. The total non-self-representing population is 28,555 of which 67% is rural and 33% is urban. Services accounts for the largest portion of the Labour Force with 40%, manufacturing is next with 21% and forestry and fishing is 15%.

Stratum 4.—It runs across the northern part of Economic Region 33. The total non-self-representing population is 31,611 of which 73% is rural and 27% is urban. The largest portion of the Labour Force—32%—is employed in services, forestry and fishing is next with 25% and manufacturing is 17%.

4. Special Features

Due to the higher sampling ratio (1.6%) the minimum size of the self-representing unit was lowered from 15,000 to approximately 10,000.

5. Self-representing Units in New Brunswick (Total-7)

Economic region		Population
30	Moncton	55,768
31	Saint John	95,563
32	Fredericton	25,836
	Edmundston	12,791
33	Newcastle-Chatham	13,196
	Campbellton-Dalhousie	17,637
	Bathurst	10,497

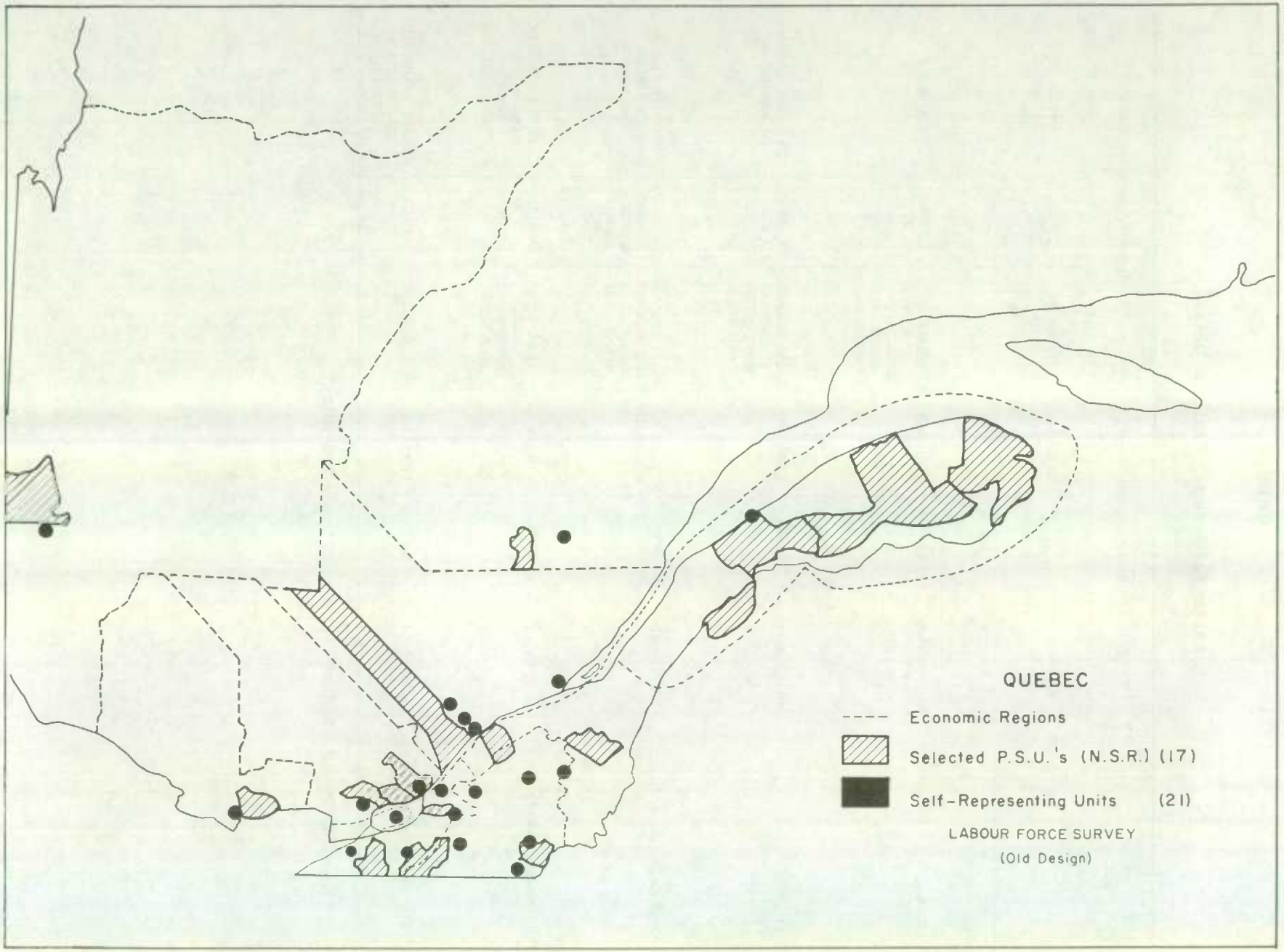
QUEBEC

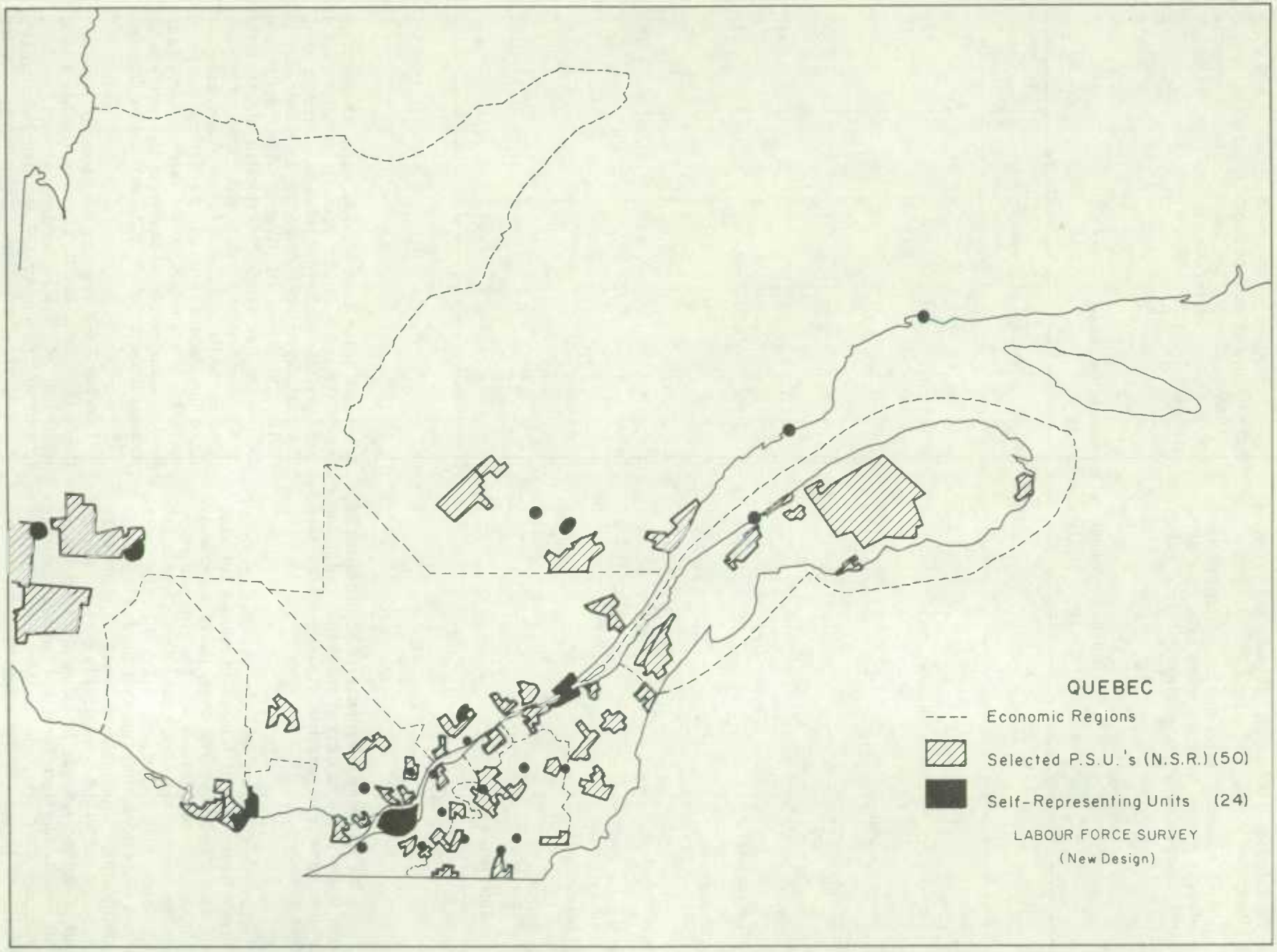
1. Labour Force Survey Design in Quebec

(sampling ratio 0.5%)

Stage of sampling	Self-representing areas			Non-self-representing areas		
	Nature of units	Size of units (pop.)	Method of selection	Nature of units	Size of units (pop.)	Method of selection
Stratum	Metropolitan area or special area	15,000 +	Certainty	Group of similar p.s.u.'s (geographically contiguous)	42,501-95,655	Certainty
First stage	Census tracts	25,000	Certainty	Rural enumeration areas and nearby small urban	3,440-6,402	Two units selected with p.p.s.
Second stage (segment)	City block(s)		p.p.s.[1] systematic	Rural enumeration area and small urban or part of it	Rural 700 Urban approximately 1,000	Systematic p.p.s. within urban and rural
Third stage (cluster)	None	None	None	Small area with recognizable boundaries	Multiple of 3 or 4 H.H.'s	Random systematic (p.p.s. for multiple clusters)
Fourth stage (household)	Household	4-5	Random systematic	Household	4-5	Random systematic in multiple clusters

[1] p.p.s. = Probability proportional to size (1961 Census population).


QUEBEC
Economic Regions
Selected P.S.U.'s (N.S.R.) (17)
Self-Representing Units (21)
LABOUR FORCE SURVEY
(Old Design)


QUEBEC
Economic Regions
Selected P.S.U.'s (N.S.R.) (50)
Self-Representing Units (24)
LABOUR FORCE SURVEY
(New Design)

3. Description of Economic Regions and Strata of Quebec

Each economic region has been stratified separately and primary sampling units have been delineated independently of another economic region. The following table shows the number of strata and primary units for each economic region. The average population of strata (as described in the report on the Canadian Labour Force Survey (Methodology) page 10) was equal to 80,000 persons.

Quebec – Number of Economic Regions, Strata and P.S.U.'s

Economic region	Stratum 1	Stratum 2	Stratum 3	Stratum 4	Total in economic region
	number of P.S.U.'s				
40 Côte-Nord Saguenay Lac St-Jean	18	17	–	–	35
41 Gaspésie Bas-St-Laurent	17	17	17	18	69
42 Chaudière	13	12	18	–	43
43 Mauricie Québec	11	13	17	–	41
44 Laurentides	16	17	14	–	47
45 Bois Francs Cantons de l'Est	13	8	9	16	46
46 Richelieu	14	15	16	–	45
47 Montreal City	[1]	–	–	–	–
48 Outaouais	16	–	–	–	16
49 Abitibi Témiscamingue	9	10	–	–	19
Total in province	–	–	–	–	**361**

[1] Self-representing unit.

In the following description of stratification of each region in the majority of cases the percentages of the three most important characteristics have been given.

Economic Region 40.—For the Labour Force Survey Redesign two Quebec regions—Côte Nord and Saguenay-Lac-St-Jean were joined together to form one Economic Region 40. Two new self-representing primary sampling units, Baie Comeau and Sept-Isles, were formed, which left the region with a non-self-representing population of 177,235 for stratification. This region is made up of counties 16, 32, 33 and 60 and is situated in the north eastern part of Quebec province including Anticosti Island, with the St. Lawrence River and the southern edge of county 32 forming the southern boundary. The population is concentrated along the coast of the St. Lawrence River, on both sides of the Saguenay River and in the Lake St. John area. The northern part of the region is very sparsely populated and a large portion has been treated as a remote area. The total population included in the remote area is 7,210. The towns of Gagnon, Schefferville and Labrieville Un. Village are located and included in the remote area. Forestry and fishing and manufacturing are fairly constant Labour Force characteristics throughout the region. Agriculture is carried on in the western part of the region around Lake St. John. The region, exclusive of the remote area, with a population of 170,025, was divided into two strata.

Stratum 1.—It is along the Saguenay River and the north shore of the St. Lawrence and has a total population of 76,551. Services account for 35%, forestry and fishing for 19% and transportation 12% of the Labour Force. Rural population is 58% and urban is 42%.

Stratum 2.—It is in the south western part of the region around Lake St. John and has a population of 93,474. In this stratum agriculture accounts for 19%, services 40% and forestry and fishing 15% of the Labour Force. Rural portion of the population is 55% and urban is 45%.

Economic Region 41.—For Labour Force Redesign purposes Quebec regions of Gaspésie and Bas-St-Laurent were combined to form one economic region which was given the number 41. This region consists of counties 9, 22, 23, 24, 30, 37, 40, 41, 58, 69 and 70. Economic Region 41 is a long narrow region running east and west. It is bounded on the north by the St. Lawrence River, on the south by the province of New Brunswick and the state of Maine. It includes the Gaspé Peninsula and Madeleine Islands on the east and goes west to approximately L'Isletville and St-Pamphile. Communications in this section are limited as the roads run along the coast line with only about four highways cutting across the the region from north to south. This had to be taken into consideration when stratifying and more so when delineating primary sampling units. The non-self-representing population of Region 41 is 348,670 which was divided into 4 strata. The outstanding Labour Force characteristics considered at this time were agriculture, forestry and fishing, mining and services. Mining is predominant in the east, forestry and fishing in the east and south, and agriculture in the western parts of the region. Forestry and fishing and mining are highly concentrated in certain areas, for example the Village of Marsoui is 51% forestry and fishing with several others about 25% and Murdockville Town has 73% of its Labour Force population in mining.

Stratum 1.—It is the north and eastern part of the Gaspé Peninsula including the Madeleine Islands. It has a total population of 86,792 of which 77% is rural and 23% is urban. There is no urban on the Madeleine Islands so for ease of enumeration 1/4 Murdockville Town and 1/3 St. Anne du Monts was allotted to each of the 3 primary sampling units on the Islands. In stratum 1 forestry and fishing accounts for 24%, services 38% and manufacturing is 13% of the Labour Force population. Although mining is small it deserves consideration.

Stratum 2.—It is the southern part of the Gaspé Peninsula and it also goes across the peninsula to the north shore in the Matane Town, Ste-Félicité Village region. The total population is 85,158 of which 60% is rural and 40% is urban. Some enumeration areas with a high percentage of urban characteristics such as manufacturing, transportation or services were treated as urbanized areas. These include in county 9, enumeration areas 406/12, 14, 15, 16, 17, 24, 25, 39, 45, 47, 48, 49, 50, 53 and in county 58, enumeration areas 441/13, 14 and 422/41, 42. Agriculture consists of 17%, forestry and fishing 20% and services 40% of the Labour Force population.

Stratum 3.—It is the south-western part of Region 41. It has a total population of 81,065 of which 75% is rural and 25% is urban. Agriculture accounts for 30% of the Labour Force population, forestry and fishing is 22% and services 30%.

Stratum 4.—It is the north-western part of Region 41. It has a total population of 95,655 of which 56% is rural and 44% is urban. Agriculture accounts for 27% of the Labour Force population with manufacturing 11% and services 39%. There is some mining.

Economic Region 42.—The Quebec Region of Chaudière is Economic Region 42 for the purposes of the Labour Force Redesign. It consists of counties 5, 7, 19, 21, 36, 38 and 45. The south-eastern portion of the region is bordered by the state of Maine and the St. Lawrence River forms the northern boundary. Forestry and fishing is predominant in the eastern portion of the region with manufacturing becoming more predominant towards the west and north along the St. Lawrence River. Agriculture also is a more important characteristic along the river. The total non-self-representing population of Region 42 is 219,692. This was divided into 3 strata, one of which runs east and west along the St. Lawrence River and the other two run north and south.

Stratum 1.—It runs north and south in the eastern section of the region. Its total population is 69,502 of which 73% is rural and 27% is urban. Forestry and fishing is an important industry in this stratum with 18% of the Labour Force population being engaged in it. Agriculture accounts for 31%, manufacturing for 11% and services 30% of the Labour Force.

Stratum 2.—It runs north and south in the western portion of the region. Its total population is 67,389 with rural accounting for 59% and urban 41%. Forestry and fishing takes only 3% of the Labour Force population while manufacturing has 20%, agriculture is 31% and services is 33%. There is some mining in this area, enough to occupy 2% of the Labour Force. This industry is not prevalent in the other two strata.

Stratum 3.—It runs along the northern part of Economic Region 42, following the St. Lawrence River. Its total population is 82,801 with 72% of this being rural and 28% urban. Agriculture is high in this stratum, utilizing 38% of the Labour Force population, services 30% and manufacturing 18%.

Economic Region 43.—The Quebec regions of Mauricie and Quebec were combined to make Economic Region 43 for the purpose of the Labour Force Redesign. This region is made up of counties 12, 39, 51, 67, 13, 46, 47, 54 and 55. In the eastern part of the region the St. Lawrence River forms the southern boundary but towards the west the economic region is on both sides of the river, although mainly towards the north. The non-self-representing population of Economic Region 43 is 229,852, which has been divided into 3 strata. In addition to this, some population is widely scattered across the northern part of the region, and this population—some 5,971 persons, has been put in a special remote area. The village of Parent is included in this remote area. Although geographically La Tuque Town, population 12,886, is situated in the remote area, it has been included with the regular non-

self-representing population and is part of stratum 2. For stratification purposes the Labour Force characteristics of agriculture, manufacturing and services were considered.

Stratum 1.—It consists of that part of Region 43 that is south of the St. Lawrence River, plus some of the most westerly section on the north side of the river. The population of this stratum is 60,110 of which 73% is rural and 27% is urban. Agriculture accounts for 34% of the Labour Force with manufacturing using 19% and services 33%. Forestry and fishing and mining are lower than in the other two strata.

Stratum 2.—It runs along the north shore of the St. Lawrence River from Quebec City west to Trois-Rivières. Its total population is 74,867 comprised of 45% rural and 55% urban. Agriculture accounts for only 21% of the Labour Force in this stratum while manufacturing is up to 27% and services is 31%. There is a small amount of forestry and fishing.

Stratum 3.—It is located along the St. Lawrence River from the eastern boundary of the region west to Quebec City, then it goes north and west to the area around the self-representing units of Shawinigan City. The total population of this stratum is 94,875 with rural accounting for 70% and urban 30%. Agriculture is low in this stratum, using only 15% of the Labour Force, manufacturing is 19% and services is high with 39%. Forestry and fishing is up over the other two strata with 9% of the Labour Force engaged in it.

Economic Region 44 is the Quebec region called Laurentides. It is made up of counties 2, 8, 18, 29, 31, 35, 44 and 71 and is the area north of Montreal City. The southern boundary of this region is the St. Lawrence and the Ottawa Rivers. The northern part of the region is sparsely settled and some of this has been made into a special remote area. The population in this remote area is 281 persons. The non-self-representing population of Economic Region 44 is 229,432. This has been made into 3 strata. The outstanding Labour Force characteristics which were used for stratification were agriculture, manufacturing durable and manufacturing non-durable. Agriculture is most predominant in the south-east section of this region.

Stratum 1.—It is located in the south-east portion of Region 44. It has a population total of 65,307 of which 68% is rural and 32% is urban. Agriculture is a major occupation with 30% of the Labour Force population engaged in it. Manufacturing is 26% and services is 31%.

Stratum 2.—It is in the south-western part of Region 44. Its total population is 82,305 of which 59% is rural and 41% is urban. Agriculture is decreasing in comparison with stratum 1 and occupies 17% of the Labour Force population. There is 27% in manufacturing and 35% in services.

Stratum 3.—It runs north of both stratum 1 and stratum 2 and then north-west to Mont-Laurier and Ferme-Neuve. The total population is 81,820 consisting of 57% rural and 43% urban. Agriculture is low in this area—9% of the Labour Force. There is some forestry and fishing—8%, manufacturing is 15% and services is very high with 48% of the Labour Force. This area has a lot of resorts which are open both winter and summer.

Economic Region 45.—For the purpose of the Labour Force Redesign, two Quebec regions of Bois Francs and Cantons de l'Est have been combined to form one region called Region 45. It is made up of counties 3, 20, 42, 74, 10, 17, 43, 57, 61, 62 and 64. The location of this region is south of the St. Lawrence River, although not bordering on the river. Its southern boundary is the state of Vermont. The total non-self-representing population of Region 45 is 255,311. There are four distinct areas with different Labour Force characteristics predominant. There are sections devoted to agriculture, mining, forestry and fishing and manufacturing. It was decided to divide this economic region into 4 strata even though two of them—one in mining and the other in forestry and fishing—would be smaller than normal.

Stratum 1.—It is high in agriculture. It is the north-western part of the economic region. The population size is 75,441 of which 72% is rural and 28% is urban. Agriculture accounts for 41% of the Labour Force population, services 25% and manufacturing 24%.

Stratum 2.—It is high in mining. It is an area south-west of the self-representing units of Thetford Mines. Total population of this stratum is 42,501 of which 50% is rural and 50% is urban. Mining is engaged in by 22% of the Labour Force population, agriculture is 22%, manufacturing is 14% and services is 30%.

Stratum 3.—It is high in forestry and fishing. It is the south-eastern part of Region 45 with a total population of 47,746 of which 66% is rural and 34% is urban. Agriculture accounts for 27%, services 31% and manufacturing 27% of the Labour Force. There is some forestry and fishing.

Stratum 4.—It is high in manufacturing. It is the south-western portion of the region, around the self-representing unit of Granby. Total population is 89,623 of which 50% is rural and 50% is urban, Manufacturing is carried on by 36% of the Labour Force, agriculture is 18% and services 31%.

Economic Region 46.—The Quebec region of Richelieu is Economic Region 46 for the Labour Force. It is made up of counties 4, 6, 11, 15, 27, 28, 34, 50, 56, 59, 63, 65, 66, 72, 73 and 75. It is located in the extreme south-west corner of the province. The most important Labour Force characteristics are agriculture, manufacturing durable and manufacturing non-durable. Total population of this region is 234,532 and it was divided into 3 strata.

Stratum 1.—It is in the north-east portion of the region. It has a total population of 73,758 of which 75% is rural and 25% is urban. Agriculture plays an important part as 42% of the Labour Force is engaged in it. Manufacturing takes 21% and services 25%.

Stratum 2. – It is across the south and up the western side of the region. Total population is 70,412 of which 72% is rural and 28% is urban. Agriculture occupies 34% of the Labour Force population and manufacturing takes 16%, services 33%.

Stratum 3. – It is a narrow strip along the south side of Montreal City and the south shore of the St. Lawrence River. Total population is 90,352 of which 48% is rural and 52% is urban. Agriculture accounts for 11%, manufacturing for 30% and services 38% of the Labour Force.

Economic Region 47. – The Metropolitan Area of Montreal City is Region 47.

Economic Region 48. – The Quebec region of Outaouais is Economic Region 48 for the Labour Force Redesign. It consists of counties 25, 26, 52 and 53. It is situated towards the south-western part of Quebec province with the Ottawa River forming the southern boundary line. The non-self-representing population of the region is 83,848. A very small part of the population – 295 persons – is scattered throughout the north-western part of this region. This section was made into a remote area. The remaining population, 83,553, was made into one stratum.

Stratum 1. – The important Labour Force characteristics of this region are agriculture which comprises 19% of the Labour Force population, forestry and fishing with 8%, manufacturing with 16% and services with 39%. As is usually the case, forestry and fishing, also mining are very highly concentrated in certain areas. The rural population comprises 62% and the urban 38% of the total population.

Economic Region 49. – The Quebec region of Abitibi-Temiscamingue is Region 49 for Labour Force Redesign purposes. It is located in the western part of Quebec province and is made up of counties 1 and 68. A large area of this region is sparsely populated and it has been made into a special remote area. The population of this remote area is 10,690 which includes the towns of Chapais and Chibougamau. The non-self-representing population of Region 49 is 102,233 which has been divided into 2 strata. Labour Force characteristics of agriculture, forestry and fishing and mining were important for stratification purposes.

Stratum 1. – It has a non-self-representing population total of 51,472 of which 70% is rural and 30% is urban. Agriculture accounts for 24% of the Labour Force population, services 38%, manufacturing 11% and there is some forestry and fishing and mining.

Stratum 2. – It has a non-self-representing population total of 50,761 of which 71% is rural and 29% is urban. Agriculture is engaged in by 12% of the Labour Force population, services 36%, forestry and fishing uses 13% and mining 18%.

4. Special Features

(a) In the stratification of areas in Quebec, the economic regions defined by the province were used. In all other provinces the economic regions used for stratification were defined by the Department of Defence Production (D.D.P.).

(b) In the remote areas rather than sampling from one list of all these areas urban and rural strata were formed and sampling was carried out independently in each stratum.

5. Self-representing Units in Quebec (Total - 24)

Economic region		Population
40	Alma	19,854
	Baie-Comeau	15,272
	Chicoutimi-Jonquière	105,009
	Sept-Iles	14,196
41	Rimouski	22,443
42	Québec-Lévis	357,568
43	Trois-Rivières-Cap-de-la-Madeleine	85,693
	Shawinigan	63,518
44	St-Jérôme	29,107
	Joliette	20,900
45	Sherbrooke	70,253
	Drummondville	39,307
	Granby	31,463
	Thetford Mines	25,798
	Victoriaville	21,697
	Magog	14,233
46	St-Jean	34,576
	St-Hyacinthe	31,659
	Valleyfield	29,849
	Sorel	28,906
47	Montreal	2,109,509
48	Hull	82,713
49	Rouyn-Noranda	30,193
	Val d'Or	21,325

ONTARIO

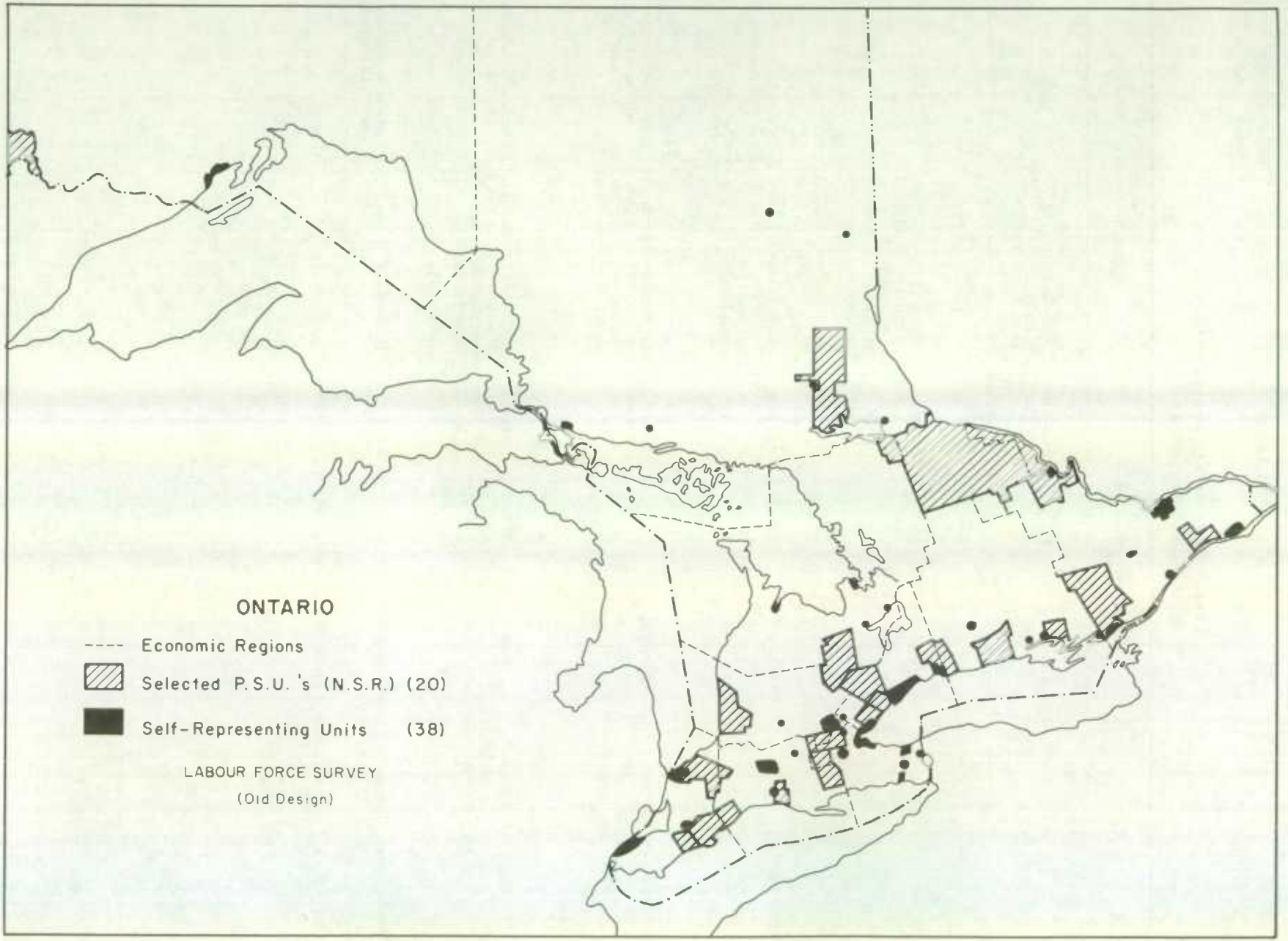
1. Labour Force Survey Design in Ontario

(sampling ratio 0.5%)

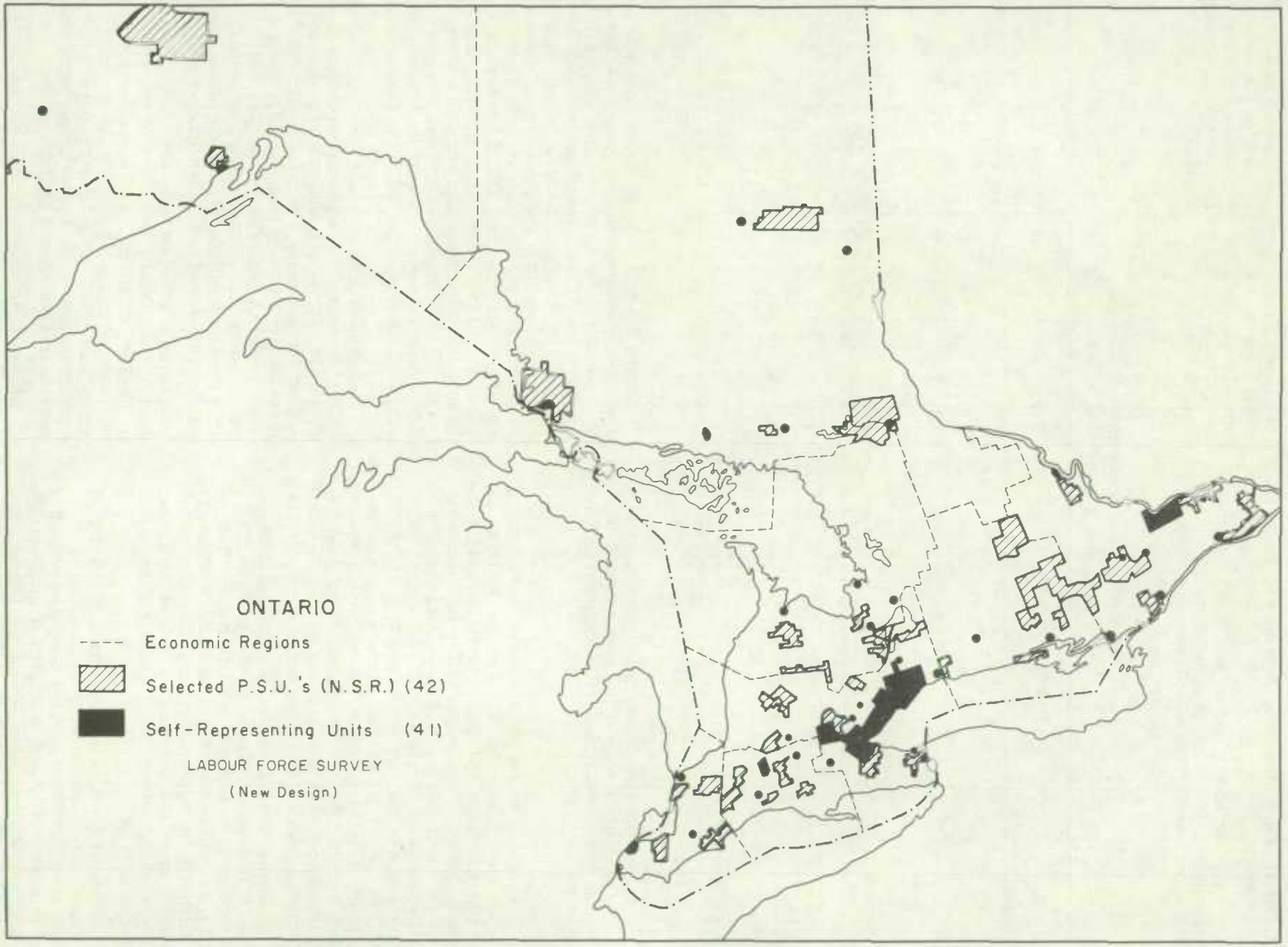
Stage of sampling	Self-representing areas			Non-self-representing areas		
	Nature of units	Size of units (pop.)	Method of selection	Nature of units	Size of units (pop.)	Method of selection
Stratum	Metropolitan area or special area	15,000+	Certainty	Group of similar p.s.u.'s (geographically contiguous)	64,747 - 126,014	Certainty
First stage	Census tracts	25,000	Certainty	Rural enumeration areas and nearby small urban	4,319 - 10,177	Two units selected with p.p.s.
Second stage (segment)	City block(s)		p.p.s.[1] systematic	Rural enumeration area and small urban or part of it	Rural 700 Urban approximately 1,000	Systematic p.p.s. within urban and rural
Third stage (cluster)	None	None	None	Small area with recognizable boundaries	Multiple of 3 or 4 H.H.'s	Random systematic (p.p.s. for multiple clusters)
Fourth stage (household)	Household	4 - 5	Random systematic	Household	4 - 5	Random systematic in multiple clusters

[1] p.p.s. = Probability proportional to size (1961 Census population).

2


ONTARIO
Economic Regions
Selected P.S.U.'s (N.S.R.) (20)
Self-Representing Units (38)
LABOUR FORCE SURVEY
(Old Design)

2


ONTARIO
Economic Regions
Selected P.S.U.'s (N.S.R.) (42)
Self-Representing Units (41)
LABOUR FORCE SURVEY
(New Design)

3. Description of Economic Regions and Strata of Ontario

Each economic region has been stratified separately and primary sampling units have been delineated independently of another economic region. The following table shows the number of strata and primary units for each economic region. The average population of strata (as described in the report on the Canadian Labour Force Survey (Methodology) page 10) was equal to 80,000 persons.

Ontario – Number of Economic Regions, Strata and P.S.U.'s

Economic region	Stratum 1	Stratum 2	Stratum 3	Total in economic region
	number of P.S.U.'s			
50	17	15	16	48
51	15	15	14	44
52	14	–	–	14
53	11	13	–	24
54	15	16	–	31
55	15	16	–	31
56	14	15	–	29
57	17	14	14	45
58	19	10	–	29
59	11	–	–	11
Total in province	–	–	–	**306**

In the following description of stratification of each region in the majority of cases the percentages of the three most important characteristics have been given.

Economic Region 50 is the most eastern region in Ontario. It has the St. Lawrence River as its southern boundary and Quebec province as its eastern boundary. There are six self-representing areas located within this region, Ottawa, Kingston, Brockville, Cornwall, Pembroke and Perth-Smiths Falls. The region is made up of counties 4, 7, 11, 12, 13, 23, 24, 39, 42, 43 and 45. It has a non-self-representing population of 275,036 which was divided into 3 strata. The important Labour Force characteristics used for stratification were agriculture, manufacturing durable and manufacturing non-durable.

Stratum 1. – It is the eastern portion of Region 50. It is from the City of Ottawa south to the St. Lawrence River and east to the province of Quebec. The non-self-representing population is 98,926 of which 69% is rural and 31% is urban. Agriculture is the main industry, engaging 36% of the Labour Force while services is next with 34% and manufacturing is 14%.

Stratum 2. – It is the area south of the City of Ottawa and a narrow strip up the Ottawa River almost to Pembroke. The non-self-representing population is 83,031 of which 61% is rural and 39% is urban. Services takes 40% of the Labour Force population while agriculture is 24% and manufacturing is 19%.

Stratum 3. – It runs down the western side and across the southern portion of Region 50. Several towns along the St. Lawrence River have a large portion of their Labour Force population in manufacturing, for example Cardinal Village is 61%. Along the Ottawa River the Labour Force characteristic of services is high, such as Deep River Town with 92%, Chalk River with 68% and Petawawa with 76% of their Labour Force population in services. The total non-self-representing population of stratum 3 is 93,079 of which 66% is rural and 34% is urban. In this stratum services accounts for 42%, manufacturing 21% and agriculture 18% of the Labour Force.

Economic Region 51 has Lake Ontario as its southern boundary. It is made up of counties 8, 16, 18, 26, 32, 38, 40 and 49. The self-representing units of Peterborough, Trenton and Belleville are located within this economic region. It has a non-self-representing population of 230,285 which was divided into 3 strata. The Labour Force characteristics used for stratification were agriculture, manufacturing durable and manufacturing non-durable.

Stratum 1. – It runs east and west along the coast of Lake Ontario (exclusive of the peninsula at the Bay of Quinte). The non-self-representing population of this stratum is 78,733 of which 53% is rural and 47% is urban. In this stratum services accounts for 39% of the Labour Force, while manufacturing engages 32% and agriculture 15%.

Stratum 2. – It runs east and west just north of stratum 1 and then dips to the south to include the peninsula at the Bay of Quinte. The non-self-repre-

senting population of this stratum is 79,383 of which 56% is rural and 44% is urban. Agriculture is more predominant in this area, comprising 26% of the Labour Force while services is 38% and manufacturing is 21%.

Stratum 3. – It consists of the northern half and (at the extreme eastern edge of Economic Region 51) a narrow strip south to Lake Ontario. The non-self-representing population of this stratum is 72,169 of which 80% is rural and 20% is urban. Services is the main industry, utilizing 39% of the Labour Force while agriculture and manufacturing each are 18%. Mining is worth noting in this area.

Economic Region 52 is the area surrounding the Metropolitan Area of Toronto City. It is made up of counties 17, 33, 36 and 54. In addition to Toronto City, the self-representing units of Brampton, Oshawa, Newmarket-Aurora and Georgetown are located in this region. The non-self-representing population total is 85,048 and this was kept as 1 stratum.

Stratum 1. – It has a non-self-representing population total of 85,048 which is 84% rural and 16% urban. The three main types of employment are services, with 36% of the Labour Force, agriculture with 25% and manufacturing with 24%.

Economic Region 53 is an area mainly south of the City of Hamilton. It is bounded on the south by Lake Erie and on the east by Lake Ontario and the United States. It is made up of counties 2, 15, 26, 51 and 53. The self-representing areas of Hamilton, Brantford, St. Catharines, Niagara Falls, Welland and Port Colborne are located within Region 53. The total non-self-representing population is 138,654 which was divided into 2 strata. The important Labour Force characteristics used for stratification were agriculture, manufacturing durable and manufacturing non-durable.

Stratum 1. – It is the south-eastern part of Economic Region 53. It has a total non-self-representing population of 64,747 which is 60% rural and 40% urban. The largest portion of the Labour Force – 40% is engaged in services, manufacturing is next with 32% and agriculture has 11% of the Labour Force.

Stratum 2. – It has a non-self-representing population of 73,907 of which 69% is rural and 31% is urban. In this stratum services accounts for 32%, agriculture 29% and manufacturing 25% of the Labour Force.

Economic Region 54 is located in the southern parts of Ontario and has Lake Erie as its southern boundary. It is made up of counties 9, 28, 31 and 34. The self-representing areas of St. Thomas, London and Woodstock are situated within this economic region. The total non-self-representing population is 174,486 which was divided into 2 strata. The Labour Force characteristics used for stratification were agriculture, manufacturing durable and manufacturing non-durable.

Stratum 1. – It is the western part and a strip along the southern boundary of Region 54. The total non-self-representing population is 84,520 of which 62% is rural and 38% is urban. Agriculture is the main occupation and accounts for 42% of the Labour Force. Services is next with 31% and manufacturing is 14%.

Stratum 2. – It has a non-self-representing population of 89,966 which is 71% rural and 29% urban. The largest portion of the Labour Force, 35%, is engaged in agriculture with services a close second with 33%. Manufacturing is the third most important industry with 19% of the Labour Force engaged in it.

Economic Region 55 is the south-western tip of the province of Ontario. It is made up of counties 10, 21 and 22. Self-representing units within this region are Sarnia, Windsor and Chatham. The non-self-representing population of Region 55 is 162,782 which was divided into 2 strata with the division falling down the centre from north to south. Important Labour Force characteristics used for stratification purposes were agriculture, manufacturing durable and manufacturing non-durable.

Stratum 1. – It has a total non-self-representing population of 78,889 of which 62% is rural and 38% is urban. It is located in the eastern half of the region and is more inclined towards agriculture than any other type of industry. Agriculture comprises 40% of the Labour Force with services next at 32% and manufacturing is 16%.

Stratum 2. – It has a total non-self-representing population of 83,893 of which 63% is rural and 37% is urban. It is located in the western half of the region. It is within this stratum that all the self-representing units are located. As is the custom around large urban areas, manufacturing plays an important role and this category comprises 26% of the Labour Force with agriculture having 25% and services 35%.

Economic Region 56 is situated in the mid-west portion of the province and is made up of counties 19, 37, 50 and 52. There are three self-representing areas within this region – Guelph, Kitchener and Stratford. The total non-self-representing population of Region 56 is 151,490 which was divided into 2 strata. Important Labour Force characteristics used for stratification purposes are agriculture, manufacturing durable and manufacturing non-durable.

Stratum 1. – It is in the south-eastern part of the region and is the area surrounding all three self-representing units. The non-self-representing population of this stratum is 72,714 of which 66% is rural and 34% is urban. Agriculture accounts for 31% of the Labour Force, services is 31% and manufacturing 27%.

Stratum 2. – It is the western and northern portion of the region. The non-self-representing population of this stratum is 78,776 of which 60% is rural and 40% is urban. Here agriculture plays a more important role, having 41% of the Labour Force population engaged in it while services has 33% and manufacturing 13%.

Economic Region 57 is in the Lake Huron, Georgian Bay region of Ontario. It is made up of counties 3, 6, 14, 29, 35 and 44. The self-representing units of Owen Sound, Orillia, Barrie and Midland – Penetanguishene are located in this region. The non-self-representing population is 233,773 which was divided into 3 strata. The Labour Force characteristics used for stratification were agriculture, manufacturing durable and transportation.

Stratum 1. – It is the part of Region 57 that is east of Georgian Bay. The non-self-representing population is 80,773 of which 67% is rural and 33% is urban. The largest part of the Labour Force – 48% – is employed in services, then follows transportation and manufacturing, each with 14%.

Stratum 2. – It is the Bruce peninsula and a strip of land around the south shore of Georgian Bay. The non-self-representing population is 78,204 which is 59% rural and 41% urban. Agriculture is more predominant here and 29% of the Labour Force is employed in it. Services accounts for 39% and manufacturing is 17% of the Labour Force.

Stratum 3. – It is in the south part of Region 57. The non-self-representing population is 74,796 of which 61% is rural and 39% is urban. Agriculture uses 43% of the Labour Force, services 29% and manufacturing 16%.

Economic Region 58 covers a very large area in the northern part of the province and it has the province of Quebec as an eastern boundary. It is made up of counties 1, 5, 27, 30, 46 and 48. There are six self-representing areas within this region – Elliott Lake, Kirkland Lake, North Bay, Sault Ste. Marie, Sudbury and Timmons. A great deal of Region 58 is remote and sparsely populated but there are pockets of population built around mining and pulp and paper towns. There is a little agriculture – 8% of the Labour Force. The total non-self-representing population of the region is 215,396 which includes 18,918 in remote areas. The high percentages of mining indicated that a mining stratum should be formed, however, the mining communities are scattered throughout the region in pockets which are non-contiguous. It was decided, therefore, to form a non-contiguous mining stratum and the remaining part would form a non-contiguous agriculture and manufacturing non-durable stratum. The primary sampling units were made large enough to allow the possibility of forming separate enumerator assignments in the rural and urban parts as these are often quite distant from each other.

Stratum 1. – It has a total non-self-representing population of 126,014 which is 51% rural and 49% urban. Pulp and paper is most important in this stratum as indicated by manufacturing non-durable having 14% and forestry 10% of the Labour Force. Services accounts for 38% and agriculture 11% of the Labour Force with mining just 2%.

Stratum 2. – It has a total non-self-representing population of 70,464 of which 53% is rural and 47% is urban. Mining is predominant in this stratum accounting for 36% of the Labour Force, services is next with 32% and transportation 12%. Agriculture is only 3% and manufacturing non-durable is 2% of the Labour Force.

Economic Region 59 is the extreme northwestern part of the province. It is west and north of Lake Superior and a very large portion of it is remote. This region is made up of counties 20, 41 and 47. The self-representing units of Fort William, Port Arthur and Kenora are located within its boundaries. The population is located in pockets scattered throughout the area. Usually one type of Labour Force characteristic is predominant in an area, particularly in an urban area. For example Balmertown and Cochenour (unincorporated village) has 80% of its Labour Force engaged in mining; Nakina (unincorporated village) has 53% of its Labour Force in transportation; Longlac (unincorporated village) has 61% of its Labour Force in forestry and fishing and so on. As the total non-self-representing population of Region 59 is 84,407 the whole region was treated as one stratum. Important Labour Force characteristics were agriculture, forestry and fishing, mining and transportation.

Stratum 1. – Owing to the nature of the area – remote, population in pockets, and road transportation between rural and urban non-existent in some instances, it was not possible to obtain as satisfactory results as have been required in other economic regions. The stratum population is 40% rural and 60% urban. Services accounts for 36%, manufacturing 18%, transportation 13% and forestry and fishing 11% of the Labour Force population.

4. Special Features

(a) Some rural enumeration areas whose population was predominantly urban in characteristics according to 1961 Census, were treated as urban areas in stratification for the Labour Force Survey. These enumeration areas are:

E.R.	E.D.	Co.	Mun.	E.A.
50	506	04	A09	5
	515	12	A01	68
	528	11	A07	12, 13, 15, 16
	528	11	A12	4, 14
	553	42	A14	1
	554	43	A03	13
51	509	08	A04	22
	524	18	A15	20, 22
53	537	51	A01	1, 2, 3
54	510	09	A07	25
58	507	05	A05	7
	507	05	C13	35
	538	46	A13	13
	538	46	B22	45
	539	30	A12	13, 14

(b) Concept of non-contiguous strata was used in Economic Region 58 as described in stratification on page 72. Also some of the primary sampling units in this region were made exceptionally large to accommodate two enumerators – one in the rural and one in the urban portion.

(c) The town of Burlington is included as a separate primary sampling unit within Hamilton self-representing unit which is in Economic Region 53, although part of Burlington is in Halton County which is part of Economic Region 52. As it is a separate primary sampling unit it could be tabulated with Economic Region 52 in the future if desired.

5. Self-representing Units in Ontario (Total - 41)

Economic region		Population
50	Ottawa	332,899
	Kingston	63,419
	Brockville	17,744
	Cornwall	43,639
	Pembroke	18,811
	Perth-Smiths Falls	14,963
51	Peterborough	49,902
	Trenton	13,183
	Belleville	30,655
52	Toronto	1,824,481
	Brampton	20,595
	Oshawa	80,918
	Newmarket-Aurora	25,233
	Georgetown	15,316
53	Hamilton	395,189
	Brantford	56,741
	St. Catharines	95,577
	Niagara Falls	54,649
	Welland	36,079
	Port Colborne	16,717
54	St. Thomas	22,469
	London	181,283
	Woodstock	20,486
55	Sarnia	61,293
	Windsor	193,365
	Chatham	29,826
56	Guelph	41,767
	Kitchener	154,864
	Stratford	20,467
57	Owen Sound	17,421
	Orillia	18,246
	Barrie	21,169
	Midland-Penetanguishene	13,996
58	Elliott Lake	13,179
	Sault Ste. Marie	58,460
	Kirkland Lake	16,510
	North Bay	23,781
	Sudbury	110,694
	Timmins	40,121
59	Kenora	13,101
	Fort William-Port Arthur	93,251

MANITOBA

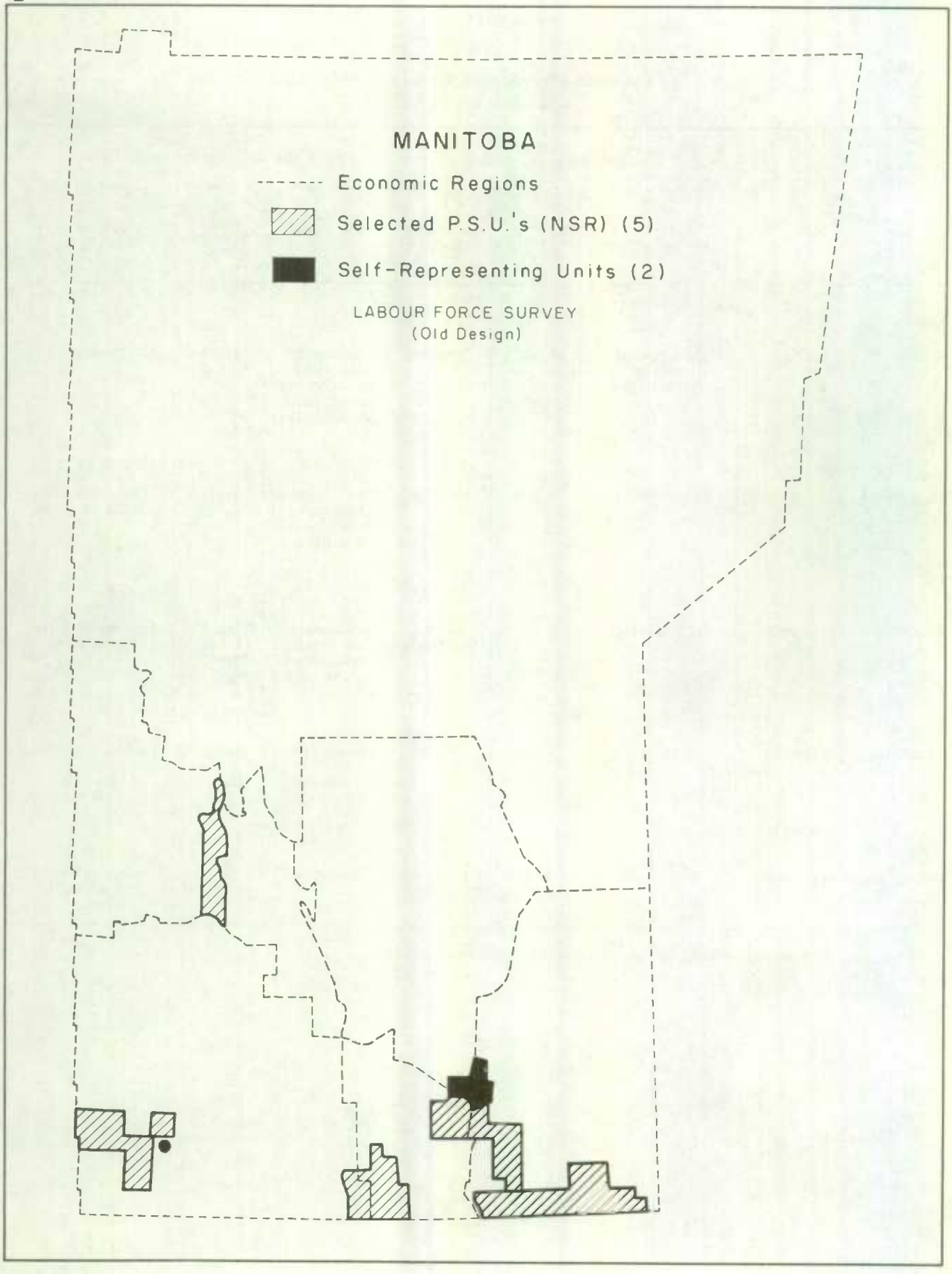
1. Labour Force Survey Design in Manitoba

(sampling ratio 0.8%)

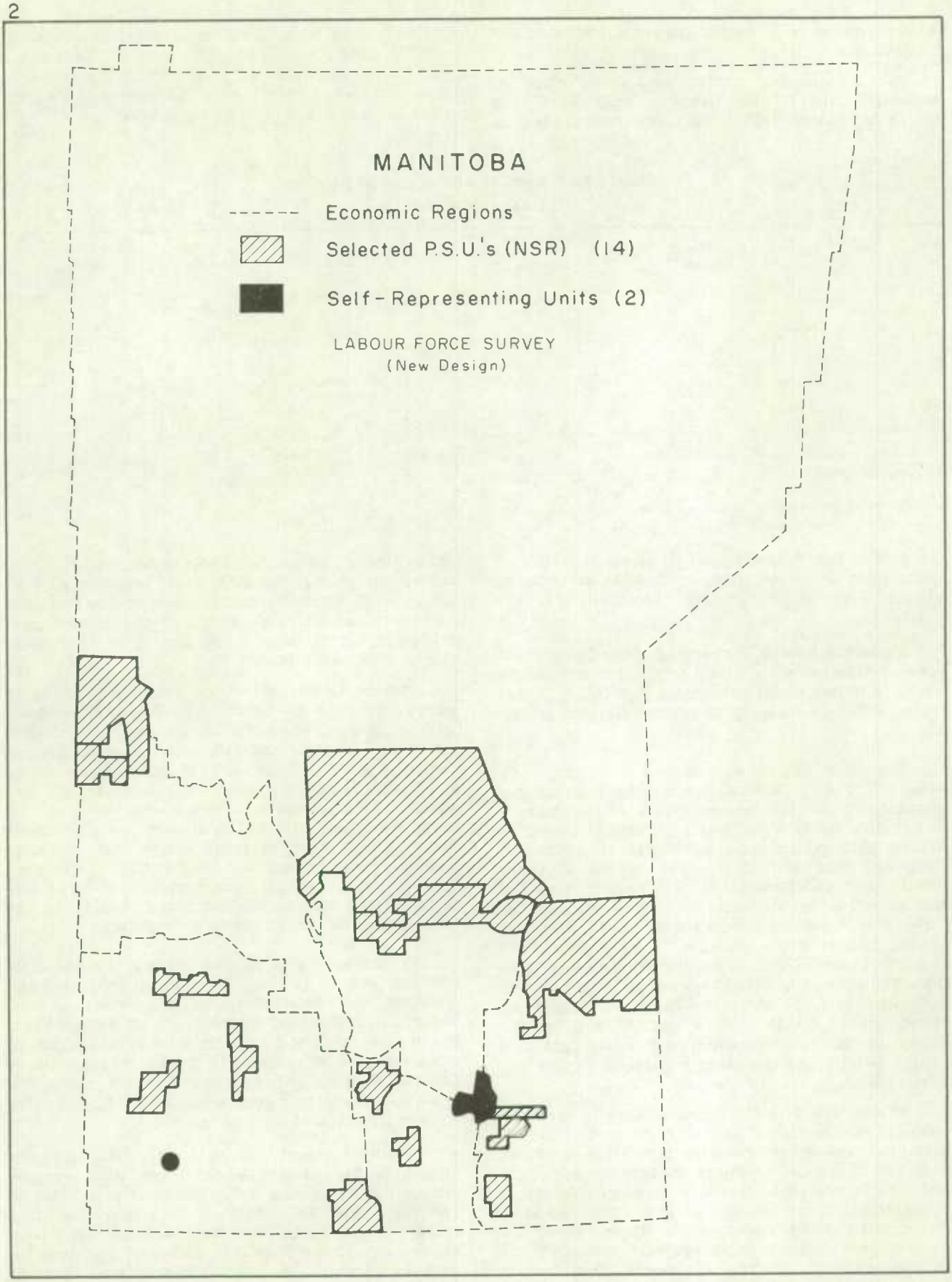
Stage of sampling	Self-representing areas			Non-self-representing areas		
	Nature of units	Size of units (pop.)	Method of selection	Nature of units	Size of units (pop.)	Method of selection
Stratum	Metropolitan area or special area	15,000+	Certainty	Group of similar p.s.u.'s (geographically contiguous)	35,381-63,823	Certainty
First stage	Census tracts	15,000	Certainty	Rural enumeration areas and nearby small urban	2,426-4,129	Two units selected with p.p.s.
Second stage (segment)	City block (s)		p.p.s.[1] systematic	Rural enumeration area and small urban or part of it	Rural 350 Urban approximately 500	Systematic p.p.s. within urban and rural
Third stage (cluster)	None	None	None	Small area with recognizable boundaries	Multiple 3 or 4 H.H.'s	Random systematic (p.p.s. for multiple clusters)
Fourth stage (household)	Household	3-4	Random systematic	Household	3-4	Random systematic in multiple clusters

[1] p.p.s. = Probability proportional to size (1961 Census population).

2


MANITOBA
Economic Regions
Selected P.S.U.'s (NSR) (5)
Self-Representing Units (2)
LABOUR FORCE SURVEY
(Old Design)

2


MANITOBA
Economic Regions
Selected P.S.U.'s (NSR) (14)
Self-Representing Units (2)
LABOUR FORCE SURVEY
(New Design)

3. Description of Economic Regions and Strata of Manitoba

Each economic region has been stratified separately and primary sampling units have been delineated independently of another economic region. The following table shows the number of strata and primary units for each economic region. The average population of strata (as described in the report on the Canadian Labour Force Survey (Methodology) page 10) was equal to 40,000 persons.

Manitoba – Number of Economic Regions, Strata and P.S.U.'s

Economic region	Stratum 1	Stratum 2	Total in economic region
	number of P.S.U.'s		
60	Metropolitan Area of Winnipeg – No. N.S.R.		–
61	12	12	24
62	10	–	10
63	19	–	19
64	17	18	35
65	18	–	18
66 Remote Area	–	–	–
Total in province	–	–	**106**

In the following description of stratification of each region in the majority of cases the percentages of the three most important characteristics have been given.

Economic Region 60 consists of the Metropolitan Area of Winnipeg with a total population of 475,989. There is no non-self-representing population in this region which is made up of census division number 20.

Economic Region 61 consists of census divisions 1, 5 and 19 and lies on the international boundary in the south-eastern part of Manitoba. It is a region which is sparsely populated in the whole eastern part and contains the Whiteshell Provincial Park and other forest reserves. There are many small lakes and swamps in this eastern area and transportation is difficult in many sections. The non-self-representing population is 76,369 with 36% of the Labour Force engaged in agriculture, 30% in services and 17% in construction and transportation. The town of Selkirk has a non-self-representing population of 7,282 which is 42% of the urban population and is divided into 8 parts. There are two strata in this region – one being a compact area around Selkirk and the other consisting of the rest of the region.

Stratum 1. – It is the larger stratum in area and consists of the eastern and southern part of the region. The non-self-representing population is 36,881 with 40% of the Labour Force engaged in agriculture and 27% in services. Non-durable manufacturing is concentrated in the villages of Powerview and Pine Falls, while mining occurs in the Bissett area. The eastern part of the area is sparsely populated and is covered with swamps and small lakes making transportation very difficult. Along the Red River from Lake Winnipeg to the international boundary, agriculture is extremely high employing in some areas almost the entire Labour Force. Formation of contiguous primary sampling units representative of the stratum, was very difficult due to the localized nature of the various industries and the inherent topography of the area. Rural portion of the population is 78%, urban is 22%.

Stratum 2. – It is a geographically compact stratum between the towns of Selkirk and Steinbach with a non-self-representing population of 39,488 which is 71% rural and 29% urban. Agriculture and services each employ 33% of the Labour Force while manufacturing accounts for another 15%. The town of Selkirk and surrounding area accounts for 10 of the urban parts in the stratum and as a result some of the urban is fairly remote from the rural portion of the primary sampling unit. The distribution of Labour Force characteristics by area was more uniform than in stratum 1 and as a result the primary sampling units are fairly compact.

Economic Region 62 consisting of census divisions 9 and 12 is the region lying between Lake Winnipeg and Lake Manitoba and extending from Metropolitan Winnipeg in the south to Berens River in the north. Only the southern third of this region is relatively free of swamp and muskeg while north of Riverton it is sparsely populated with few roads. The non-self-representing population is 35,381 and there is only 1 stratum in the region.

Stratum 1. – Agriculture is the main industry employing 54% of the Labour Force with services accounting for another 28%. The rural population is 78% and urban 22%. Most of the primary sampling units cover a fairly large area and are irregularly shaped due to the localized nature of different industries and lack of accessibility by road between different areas. A maximum effort has been made to preserve contiguity in the formation of primary sampling units representative of the stratum.

Economic Region 63 is the region south-west of Winnipeg extending from Lake Manitoba south to the international boundary and consists of census divisions 2 and 6. The city of Portage la Prairie with a non-self-representing population of 11,311 lies within this region. There is only 1 stratum and the non-self-representing population is 63,823 of which 62% is rural and 38% is urban.

Stratum 1. – Of the 20,249 persons in the Labour Force 45% are employed in agriculture, 36% in services, 8% in transportation and 6% in the manufacturing industries. The city of Portage la Prairie was split into eight urban parts and in only two of the primary sampling units so formed was the mileage in excess of 20 miles. Because of the nature of the topography and the network of roads, all areas are reasonably accessible.

Economic Region 64 is the south-western region of the province including the Riding Mountain National Park in the north and extending south to the international boundary and consists of census divisions 3, 4, 7, 8, 10, 11 and 13. The city of Brandon with a population of 28,166 is treated as a self-representing unit. The region which has a non-self-representing population of 117,106 was divided into 2 strata of almost equal size. Stratification was based on "Type of Farming" using wheat, small grains and other farming as the indicators, which were plotted to form characteristic patterns and then split into 2 strata.

Stratum 1. – It is the eastern part of the region with a total population of 59,324. In this stratum a larger percentage of farms is engaged in wheat farming than in stratum 2 and a smaller percentage of the Labour Force, 52% is engaged in agriculture. Services accounts for a further 31% and construction 9% of the Labour Force. The rural/urban ratio for this stratum is 74/26.

Stratum 2. – It is the western part of the region, having a total population of 57,782 of which 75% is classed as rural. Agriculture and services are the two dominant Labour Force characteristics with 55% of the Labour Force in agriculture and 30% engaged in services. Construction accounts for a further 9%. The percentage of commercial farms engaged in wheat growing in this stratum is lower than in stratum 1.

Economic Region 65 consists of census divisions 14, 15, 17 and 18 which lie north of the Riding Mountain National Park along the Saskatchewan border and contains Duck Mountain Park and Reserve and the Porcupine Forest Reserve. Some areas have rather difficult access due to lack of roads and a good many rivers and small lakes. The non-self-representing population for the region is 56,926 which consists of only 1 stratum. The town of Dauphin with a population of 7,374 is the largest urban area and was split among 8 primary sampling units.

Stratum 1. – It is the whole of Economic Region 65 with 72% of the population classed as rural. The two main Labour Force characteristics are agriculture with 52% and services with 30%. The area east of Dauphin is extremely high in agriculture which in some areas employs almost all of the Labour Force. Approximately 70% of the rural Labour Force is engaged in agriculture and 63% of the urban in services.

Economic Region 66 consists of census division 16 and has been treated as a remote area. The towns of Flin Flon and The Pas are located within this region with a combined population of 15,217.

4. Special Features

(a) Economic Regions 62, 63 and 65 were treated as single strata and Regions 61 and 64 were both divided into 2 strata. Stratification in Region 61 was based on Labour Force characteristics, while that for Region 64 was based on "Types of Farming" due to the similarity of Labour Force characteristics throughout the region. Results obtained in the formation of primary sampling units were good with the exception of 2 strata and this was due to pockets of one particular industry that were not uniformly distributed throughout the area.

5. Self-representing Units in Manitoba (Total - 2)

Economic region		Population
60	Winnipeg M.A.	475,989
64	Brandon	28,166

SASKATCHEWAN

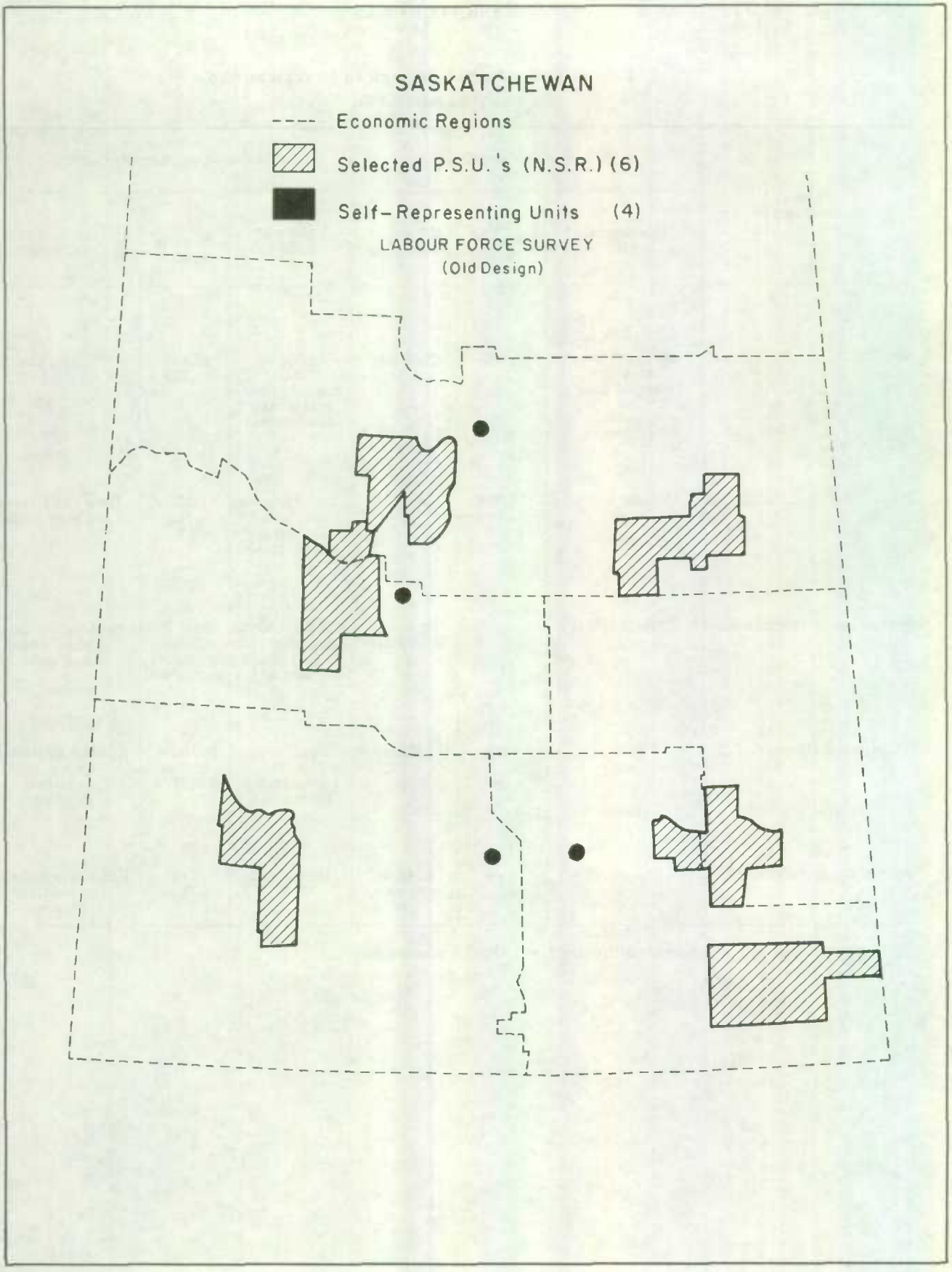
1. Labour Force Survey Design in Saskatchewan

(sampling ratio 0.8%)

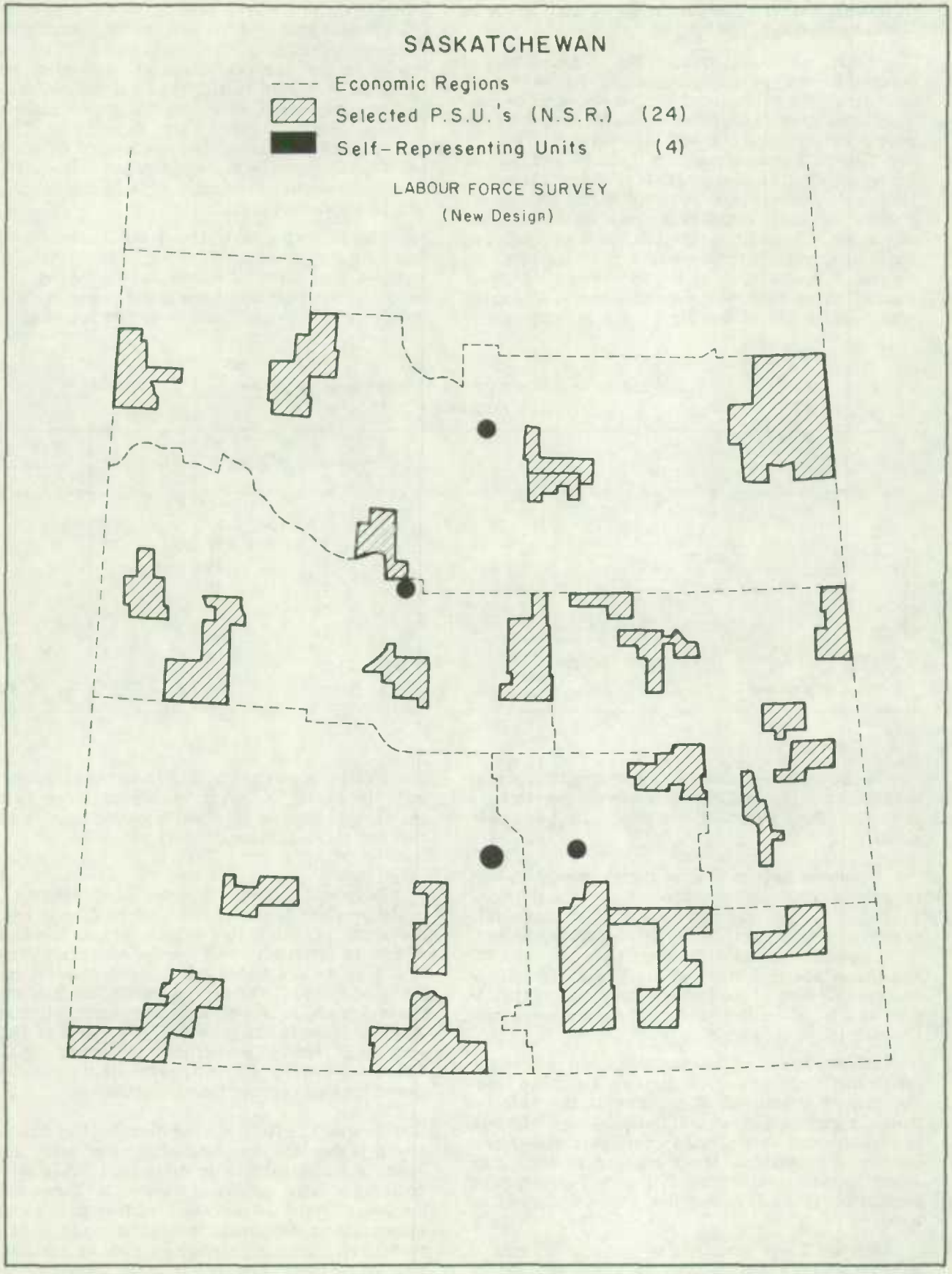
Stage of sampling	Self-representing areas			Non-self-representing areas		
	Nature of units	Size of units (pop.)	Method of selection	Nature of units	Size of units (pop.)	Method of selection
Stratum	Metropolitan area or special area	15,000 +	Certainty	Group of similar p.s.u.'s (geographically contiguous)	40,405 - 61,275	Certainty
First stage	Census tracts	15,000	Certainty	Rural enumeration areas and nearby small urban	1,892 - 4,165	Two units selected with p.p.s.
Second stage (segment)	City block(s)		p.p.s.[1] systematic	Rural enumeration area and small urban or part of it	Rural 350 Urban approximately 500	Systematic p.p.s. within urban and rural
Third stage (cluster)	None	None	None	Small area with recognizable boundaries	Multiple of 3 or 4 H.H.'s	Random systematic (p.p.s. for multiple clusters)
Fourth stage (household)	Household	3 - 4	Random systematic	Household	3 - 4	Random systematic in multiple clusters

[1] p.p.s. = Probability proportional to size (1961 Census population).

2


SASKATCHEWAN
Economic Regions
Selected P.S.U.'s (N.S.R.) (6)
Self-Representing Units (4)
LABOUR FORCE SURVEY
(Old Design)

2


SASKATCHEWAN
Economic Regions
Selected P.S.U.'s (N.S.R.) (24)
Self-Representing Units (4)
LABOUR FORCE SURVEY
(New Design)

3. Description of Economic Regions and Strata of Saskatchewan

Each economic region has been stratified separately and primary sampling units have been delineated independently of another economic region. The dominating Labour Force characteristic for the province is agriculture with approximately 50% of the Labour Force engaged in farming and 30% in services. Stratification by Labour Force characteristic patterns was not possible since all regions showed the same basic pattern and delineation for strata was not possible. The industrial group chosen for stratification purposes was agriculture based on "Farm Sales Value" and "Percentage of Wheat Farms" using data for commercial farms. The three significant types of farming for the province are:– cattle, hog and sheep raising which accounts for 9%, small grains–12% and wheat farming 68%. Since wheat farming was considerably higher than any other type the percentage of commercial wheat farms for each municipality was calculated, divided into ranges for the economic region and plotted on a map. Similarly the "Farm Sales Value", was also plotted and strata were delineated on the patterns thus formed, with consideration being given to stratum size and contiguity of municipalities with similar characteristics.

The following table shows the number of strata and primary units for each economic region. The average population of strata (as described in the report on the Canadian Labour Force Survey (Methodology) page 10) was equal to 40,000 persons.

Saskatchewan – Number of Economic Regions, Strata and P.S.U.'s

Economic region	Stratum 1	Stratum 2	Stratum 3	Total in economic region
	number of P.S.U.'s			
70	19	18	–	37
71	19	18	–	37
72	15	15	–	30
73	16	16	16	48
74	18	18	16	52
75 Remote Area	–	–	–	–
Total in province	–	–	–	**204**

In the following description of stratification of each region in the majority of cases the percentages of the two most important characteristics have been given.

Economic Region 70 is in the south-eastern part of the province and consists of census divisions 1, 2 and 6. The city of Regina lies within this region and is treated as a self-representing unit. The non-self-representing population is 109,702 and the region is divided into 2 strata. Agriculture accounts for 50% of the Labour Force and stratification was based on this factor using "Percentage of Commercial Wheat Farms".

Stratum 1.–It is the south-eastern part of the region and contains census division 1 and the eastern part of division 2. Agriculture is the main industry engaging 41% of the Labour Force and 36% is in services. This stratum contains a higher proportion of commercial farms engaged in other than wheat farming than stratum 2. Non-self-representing population is 55,787 of which 60% is classed as rural.

Stratum 2.–It consists of census division 6 and the western part of division 2 and has 59% of the Labour Force in agriculture and 28% in services. The stratum population is 53,915 and the rural/urban ratio is 81/19. A larger number of farms in this region are engaged in wheat growing than in other types of farming, approximately 66%.

Economic Region 71 is the south-western part of the province bound on the west by Alberta and on the south by the United States border. It consists of census divisions 3, 4, 7 and 8 which are divided into 2 strata and has a non-self-representing population of 113,014. The city of Moose Jaw lies within the region and is treated as a self-representing unit. The city of Swift Current with a population of 12,186 was split among ten primary sampling units in stratum 2 and as a result, some of the rural segments are quite remote from the urban.

Stratum 1.–It is the eastern half of the economic region and consists of census divisions 3, 7 and 5 municipalities in division 4. This stratum contains a large number of commercial farms within the lower "Farm Sales Value" of less than $5,000–approximately 48% being within the range of $1,200 to $4,999. Agriculture employs 61% of the Labour Force, services 27% and transportation 7%. The rural/urban ratio in the stratum is 82/18.

Stratum 2. – It consists of the balance of division 4 and all of division number 8. The city of Swift Current lies within this stratum. The urban percentage is 42% of the population and 38% of the Labour Force is employed in the service industries. The number in agriculture is slightly less than in the other stratum with 46% of the Labour Force being so employed and 9% being in transportation. Stratum population is 54,526. Out of a total of 6,897 commercial farms 4,769 or 69% have a "Farm Sales Value" of $5,000 and over.

Economic Region 72 lies in the west central part of Saskatchewan encompassing census divisions 11, 12, and 13. The Labour Force in this region, like the other regions in the province, is engaged mainly in agriculture, and this category employs 54% of the Labour Force with 30% being in services. Regional non-self-representing population is 88,741 and the city of Saskatoon is treated as a self-representing unit. The region was divided into 2 strata of approximately 44,000 population using "Farm Sales Value" for commercial farms only, as the criterion.

Stratum 1. – With a non-self-representing population of 44,315, this stratum consists of census division 11 and the southern part of census division 12, and has a rural population of 81%. Agriculture and services are the two significant industrial groups with 66% of the rural Labour Force engaged in agriculture and 63% of the urban engaged in services. This gives an overall result for the stratum of 56% of the Labour Force in agriculture and 29% in services. This stratum contains a large percentage of commercial farms with "Value of Farm Sales" greater than $5,000.

Stratum 2. – It lies along the Alberta boundary in central Saskatchewan and is approximately the same size in both population and area as stratum 1. The rural/urban ratio is 70/30 of which 53% of the Labour Force are engaged in agriculture and 30% in services. The "Farm Sales Value" in this stratum is slightly lower than in stratum 1 with 54% of commercial farms having a Sales Value of less than $5,000.

Economic Region 73 is made up of three census divisions 5, 9 and 10 which lie in the east central part of the province. The non-self-representing population is 125,012 with 58% of the Labour Force engaged in farming and 28% in services. The cities of Melville and Yorkton are within this region and form a significant part of the urban population for the region – approximately 38%. There are no self-representing units in this region which has been divided into 3 strata based on "Percentage of Commercial Wheat Farms".

Stratum 1. – It is census division 5 which lies on the Manitoba border in the south-eastern part of the region. The percentage of commercial wheat farms compared to other types of farming in the region is 59% and the average "Farm Sales Value" is between $3,750 and $5,000. The stratum non-self-representing population is 44,177 of which 66% is rural, and 56% of the Labour Force is engaged in agriculture and 27% in services.

Stratum 2. – It is composed of the easterly part of census division number 9 lying along the Manitoba border in the north-eastern part of the region. Non-self-representing population is 40,430 with 58% rural and 42% urban. The city of Yorkton with a population of approximately 10,000 creates a higher urban percentage in this stratum. Despite the high urban ratio 50% of the Labour Force is engaged in agriculture, 33% in services and 8% in transportation. Average "Farm Sales Value" is between $2,500 and $3,750 and "Percentage of Wheat Farms" is 50%. In this stratum there is a fairly high percentage of farms engaged in growing small grains – approximately 29%.

Stratum 3. – It is in the north-western part of the region and is made up of census division 10 and the westerly part of division 9. The stratum non-self-representing population is 40,405 and has the highest percentage of rural population of the three strata – 81%. Agriculture employs 68% of the Labour Force and services 22%. The "Value of Farm Sales" is between $2,500 and $3,750 and "Percentage of Commercial Wheat Farms" a significant 84%.

Economic Region 74 is a large area that stretches completely across the province marking the northern limits of the built up areas and road systems and is composed of census divisions 14, 15, 16 and 17. The city of Prince Albert which is treated as a self-representing unit lies in the north central part of this region. The non-self-representing population is 177,515 of which 33,625 or 55% of the Labour Force are engaged in farming and 30% in services. The region is divided into 3 strata on the basis of "Value of Farm Sales".

Stratum 1. – It consists of the eastern half of census division 14 which lies on the Manitoba-Saskatchewan border and the northern parts of divisions 15, 16 and 17 forming a long contiguous stratum from the eastern to the western provincial boundaries. Types of farming in this region are more varied with a larger proportion of farms engaged in raising cattle, hogs, sheep and small grains than in the other regions. The non-self-representing population is 61,179 of which 78% is rural. Agriculture accounts for 58% of the Labour Force and services 25%. The average "Farm Sales Value" in this stratum is between $2,500 and $3,750.

Stratum 2. – It has approximately the same non-self-representing population (61,275) as stratum 1 but is much smaller in area, consisting of those municipalities in census division 15 south of the Saskatchewan River and several municipalities in the south-western section of division 14. Largest portion of the Labour Force – 59%, is engaged in agriculture, wheat again being the predominant crop and "Value of Farm Sales" in this stratum is fairly high, being $3,750 and over. Services accounts for 29% of Labour Force. The urban centres are uniformly distributed throughout the stratum and employ 66% of their Labour Force in services.

Stratum 3.—It contains a few municipalities in the southern part of census division 16 and the southern half of division 17. The city of North Battleford is located within this region in the southwestern corner of division 16 and is the urban part for 10 of the 16 primary sampling units. The urban percentage, 36%, is larger than in the other two strata in this region and as a result services constitutes a large part of the Labour Force, 37%, with 47% employed in agriculture. "Value of Farm Sales" in this area is fairly high with the majority of commercial farms in the $3,750 and over class.

Economic Region 75 consists of the rest of the province lying north of Economic Region 74 with a total non-self-representing population of 6,303. The town of Creighton with a population of 1,729 is the only area of any significant size and in it 61% of the Labour Force is engaged in mining. The rest of the area is sparsely populated with very few roads. Consequently the whole region was treated as a "Remote Area" and included along with other "Special Areas" in a separate stratum.

4. Special Features

(a) Since Labour Force characteristics were similar within economic regions, stratification was based on "Farm Sales Value" and "Percentage of Wheat Farms", using data for commercial farms; see page 84.

(b) Due to the distribution of villages throughout the province, those with a population of less than 500 were treated as rural and combined with surrounding rural areas in the formation of primary sampling units.

5. Self-representing Units in Saskatchewan (Total - 4)

Economic region		Population
70	Regina	112,141
71	Moose Jaw	33,206
72	Saskatoon	95,526
74	Prince Albert	24,168

ALBERTA

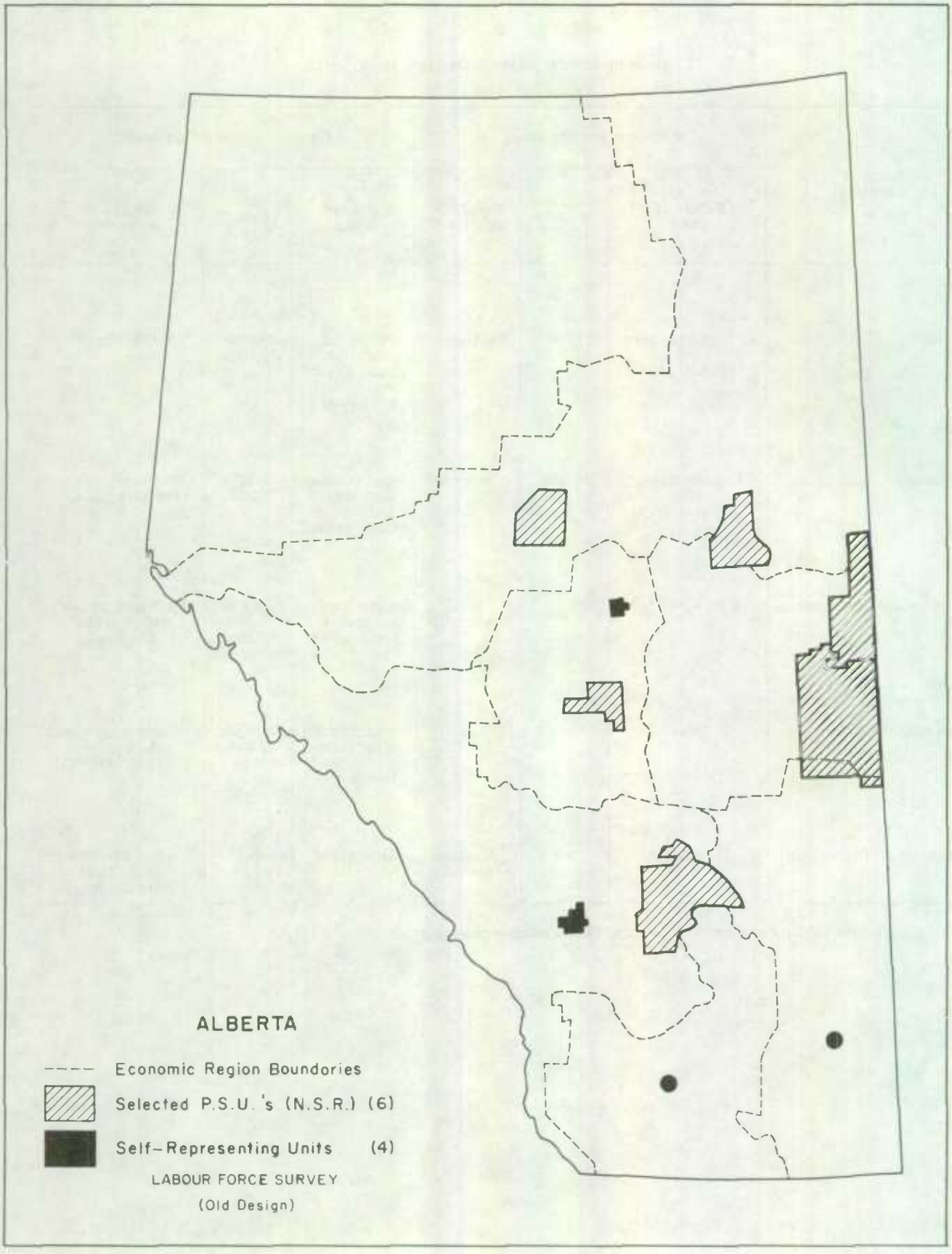
1. Labour Force Survey Design in Alberta

(sampling ratio 0.8%)

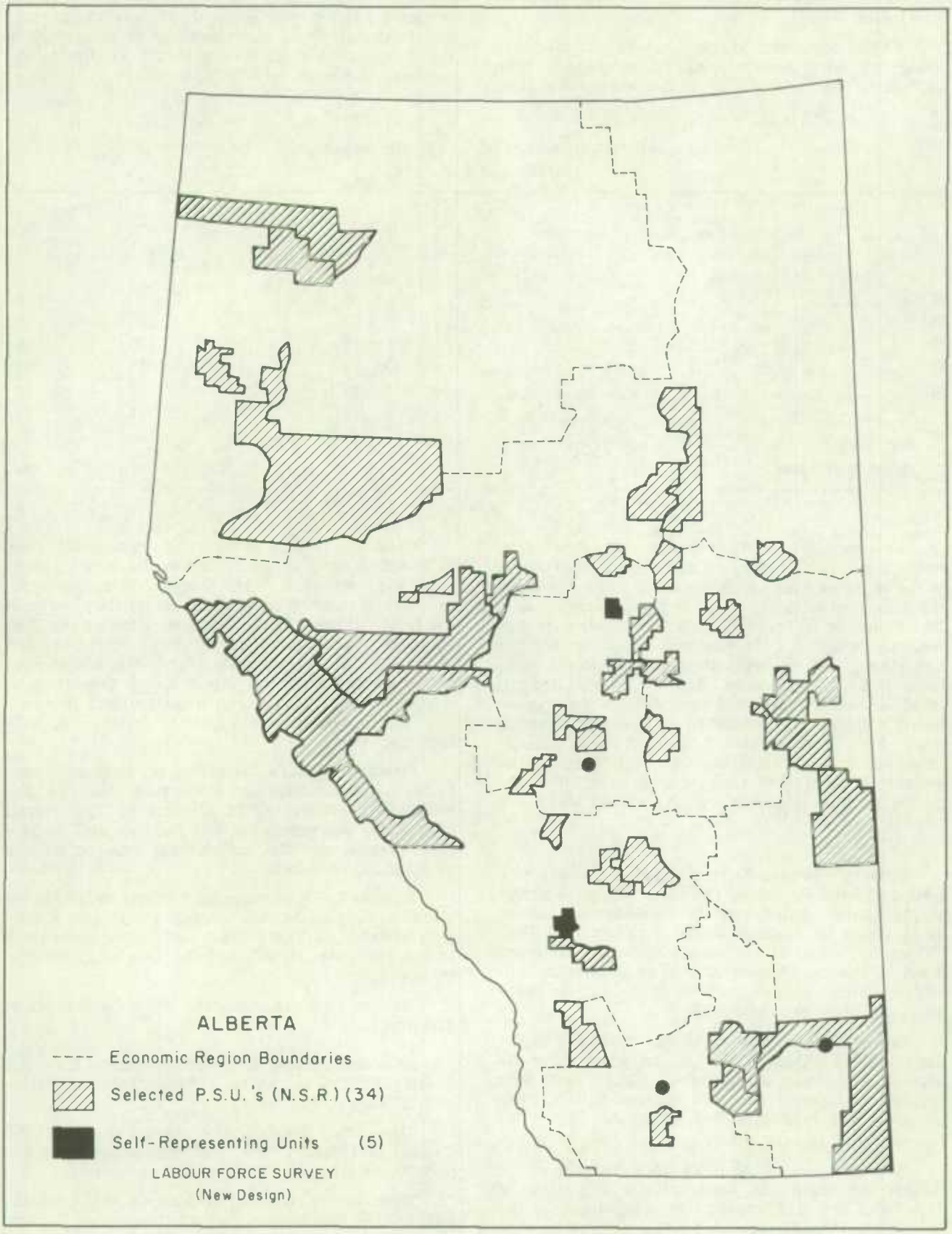
Stage of sampling	Self-representing areas			Non-self-representing areas		
	Nature of units	Size of units (pop.)	Method of selection	Nature of units	Size of units (pop.)	Method of selection
Stratum	Metropolitan area or special area	15,000+	Certainty	Group of similar p.s.u.'s (geographically contiguous)	35,000-55,000	Certainty
First stage	Census tracts	15,000	Certainty	Rural enumeration areas and nearby small urban	3,200-5,500	Two units selected with p.p.s.
Second stage (segment)	City block (s)		p.p.s.[1] systematic	Rural enumeration area and small urban or part of it	Rural 500 Urban approximately 800	Systematic p.p.s. within urban and rural
Third stage (cluster)	None	None	None	Small area with recognizable boundaries	Multiple of 3 or 4 H.H.'s	Random systematic (p.p.s. for multiple clusters)
Fourth stage (household)	Household	3-4	Random systematic	Household	3-4	Random systematic in multiple clusters

[1] p.p.s. = Probability proportional to size (1961 Census population).

2


ALBERTA
Economic Region Boundories
Selected P.S.U.'s (N.S.R.) (6)
Self-Representing Units (4)
LABOUR FORCE SURVEY
(Old Design)

2


ALBERTA
Economic Region Boundaries
Selected P.S.U.'s (N.S.R.) (34)
Self-Representing Units (5)
LABOUR FORCE SURVEY
(New Design)

3. Description of Economic Regions and Strata of Alberta

Each economic region has been stratified separately and primary sampling units have been delineated independently of another economic region.

The following table shows the number of strata and primary units for each economic region. The average population of strata (as described in the report on the Canadian Labour Force Survey (Methodology) page 10) was equal to 40,000 persons.

Alberta – Number of Economic Regions, Strata and P.S.U.'s

Economic region	Stratum 1	Stratum 2	Stratum 3	Total in economic region
	number of P.S.U.'s			
80	9	–	–	9
81	13	13	–	26
82	14	13	10	37
83	11	11	14	36
84	15	13	11	39
85	12	15	7	34
86	12	10	–	22
Total in province	–	–	–	**203**

Economic Region 80 is made up of census divisions 1 and 4. It is situated in the south-east corner of the province running mainly north and south along the border of Saskatchewan. It has a population of 28,890 persons. There is only one stratum in this region. Agriculture is the main type of activity comprising 54% of the Labour Force. Rural population is 67% and urban is 33%. The town of Redcliff is 56% manufacturing compared with 5% average for whole stratum. Its population is distributed among many p.s.u.'s to minimize its effect. A military area, which is not enumerated as part of the regular sample (it is treated as a special area) is in the centre of this economic region, almost cutting it in half.

Economic Region 81 is situated in the southern part of Alberta, stretching 105 miles along the border of the United States and its south-western corner being about 18 miles from the boundary of British Columbia. Region 81 is made up of census divisions 2 and 3. The most important type of activity is agriculture which accounts for 48% of the Labour Force and services is next with 32%.

Stratum 1. – It consists of municipalities in the north-eastern portion of the region which have the highest percentage of agriculture. They have been grouped together to form one stratum with a population of 64% rural and 36% urban and 52% of the Labour Force in agriculture.

Stratum 2. – It consists of the remainder of the region, the south and west, with a population of 49% rural and 51% urban. The percentage of the Labour Force in agriculture for this stratum is 43%. Mining is very localized and the population engaged in mining in the whole stratum is very small.

Economic Region 82 comprises census divisions 5, 6 and 9, and is made of two distinct types of areas: – a) divisions 5 and 6 are of farm land type, b) while division 9 is a mountain territory, extending from Waterton Lakes National Park at the U.S. boundary, to Jasper National Park inclusive, and including also the Rocky Mountains Forest Reserve. In the census divisions 5 and 6, the proportion of the Labour Force employed in agriculture is 49.4% and 47.5% respectively while in division 9, it is less than 4%.

Stratum 1. – It is composed of division 5 and parts of municipalities Rockyview No. 44 and Mountain View No. 17 in division 6. The overall agriculture percentage is 85% in the rural part of this stratum, and the predominant type of farming is grain and livestock.

Stratum 2. – It is composed of the remainder of division 6, plus all the mining towns and places from division 9. The overall agriculture percentage in the rural part is 65% and the type of farming is livestock.

Stratum 3. – It is composed of the remainder of division 9.

Economic Region 83 comprises census divisions 7 and 10. The region is located about 100 miles east of Edmonton.

The total population according to the 1961 Census is 109,950. The rural population is 66,819 or 61%, the urban is 43,131 or 39% of the total.

Wheat is the principal crop grown in the region, although in the eastern part of the region the emphasis is towards the production of livestock.

The region has been divided into 3 strata.

Stratum 1. – It has a population of 33,136 comprised of 55% rural and 45% urban. Agriculture is the predominant occupation with 44% of the Labour Force in this category and services next with 37%. The main type of agriculture is wheat farming. Mining occupies 3% of the Labour Force.

Stratum 2. – It has a population of 33,877 comprised of 61% rural and 39% urban. Agriculture is the main characteristic with 54% of the Labour Force in this category and services is next important with 31%.

Stratum 3. – It has a population of 42,937 of which 65% is rural and 35% urban. Farming in this area is of the mixed farming variety, some wheat and some livestock. The Labour Force population of stratum 3 has 59% of its total employed in agriculture and 28% employed in services.

Economic Region 84 comprises census divisions 8 and 11 and an area from Edmonton on the north to Red Deer on the south, extending west to the foothills at Drayton Valley and Rocky Mountain House. Agriculture is the main characteristic in the rural part. Livestock is the predominant type of farming in both divisions with some dairy and grain farms in the surroundings of Edmonton City. The region has been divided into 3 strata.

Stratum 1. – It consists of parts of division 8 and 11. Population – 46,578, rural 57%, urban 43%. The main characteristics are agriculture 45%, service 36%.

Stratum 2. – It consists of parts of division 8 and 11. Population – 40,331, rural 62%, urban 38%. The main characteristics are agriculture 42%, service 26%, mining 12%.

Stratum 3. – It consists of parts of division 8 and 11. Population – 32,192, rural 78%, urban 22%. The main characteristics are agriculture 50%, service 25%, transport and construction 14%.

Economic Region 85 comprises census divisions 12, 13 and 14. Divisions 12 and 13 are located along a farming belt north of the North Saskatchewan River and Edmonton City, extending east-west from the Saskatchewan boundary to Lac Ste. Anne District, and north-east of the Athabasca River; while division 14 is located at the foothills from Lac Ste. Anne District to Jasper National Park. The type of farming in Region 85 is predominantly livestock with grain crops, and also some dairy farming.

While the overall rural-urban percentage distribution for the region is 71-29, the percentages for divisions 12, 13 and 14 are 69-31, 79-21 and 55-45 respectively, and their percentages of agriculture characteristics to total Labour Force are 56, 61 and 14% for each division.

In division 14, it is noteworthy to point out that municipalities 79 I.D. and 96 I.D. with a 100% rural population have no agriculture in the Labour Force while municipality 95 I.D. with a rural population of 3,638 persons, has only 210 or 19% employed in agriculture, out of 1,085 in the Labour Force. This situation is explained by the fact that the North Western Pulp and Paper Company is operating an important pulp mill in the town of Hinton and also some other related operations throughout the entire district.

Also, it accounts for the high percentage of forestry employment in the rural population, because most of those persons are dependent for employment on the pulp mill and operations related to it.

Stratum 1. – It consists of the entire division 12. Population – 36,330, rural 69%, urban 31%. The main characteristics are agriculture 56%, service 31%.

Stratum 2. – It consists of the densely populated parts of divisions 13 and 14. Population – 45,050, rural 77%, urban 23%. The main characteristics are agriculture 61%, service 24%.

Stratum 3. – It consists of the remainder of divisions 13 and 14. Population – 19,231, rural 60%, urban 40%. The main characteristics are service 31%, forestry 14%, transport and construction 21%, agriculture 13%.

Economic Region 86 comprises census division 15 and is the Alberta Peace River Region in the north-western part of the province. The main type of industry for the whole region is agriculture which accounts for 41% of the persons in the Labour Force. Services is the next highest with 34%. In the central and north-western areas of the region agriculture is the most important activity while the southern and eastern areas have services as their main type of occupation with agriculture second. The type of agriculture is grain and livestock. There is a small area in the south-eastern portion of the economic region, around the town of Swan Hills, which is predominantly mining. The population for the whole region is 62% rural and 38% urban with the areas that are highest in agriculture having the largest percentage of rural population.

Stratum 1. – It consists of the north-western and central areas of the region. Population – 37,261, rural 70%, urban 30%. The main characteristics are agriculture 50%, service 29%, transport and construction 15%.

Stratum 2. – It consists of the southern and eastern portion of the region. Population – 30,405, rural 52%, urban 48%. The main characteristics are service 39%, agriculture 30%, transport and construction 17%.

In the municipality Grande Prairie, County I (A25), agriculture is more important than in the rest of the stratum but because of its large population, 8,803 and its location, it was not practical to include it with Stratum 1.

In the area in the south-eastern section of Stratum 2 including the town of Swan Hills, mining is an important occupation. This area has been distributed among as many primary sampling units as possible.

4. Special Features

(a) The nature of some areas in the province of Alberta calls for a special treatment as far as the Labour Force Survey is concerned. For example, areas around Jasper and Banff are very **sparsely populated** and are quite remote from any other areas to be enumerated for the Labour Force Survey. For this reason the enumeration in these areas is not carried out by an enumerator hired locally but is the responsibility of the Regional Office itself. From time to time the Regional Office contacts the park superintendent and obtains an up-to-date list of dwellings in the area. The enumeration is restricted to summer months only. In the winter months, the area is not enumerated as it is vertually uninhabited. The sample of dwellings for the Labour Force in these areas is selected from the list provided periodically by the superintendent.

(b) In the **remote areas**, which are mostly situated in the north of Alberta, the co-operation of the Royal Canadian Mounted Police has been secured for the Labour Force Survey. A list of the heads of households of selected areas was obtained on the basis of the 1961 Census Visitation Records. The Royal Canadian Mounted Police was given this list and the description of the area for the enumeration purposes, (every person in the household of the selected head of household is enumerated). The Royal Canadian Mounted Police is responsible for keeping this list up-to-date by adding or deleting households in the selected areas.

(c) Certain rural enumeration areas whose population was predominantly urban in characteristics according to 1961 Census, were treated as urban areas in the stratification for the Labour Force Survey. Such was the case, for example, in the Improvement District 42. In this District agriculture accounts only for 4.5% and, therefore, the District was treated as an urban centre.

5. Self-representing Units in Alberta (Total - 5)

Economic region		Population
80	Medicine Hat	24,484
81	Lethbridge	35,454
82	Calgary	279,062
84	Edmonton	337,568
	Red Deer	19,612

BRITISH COLUMBIA

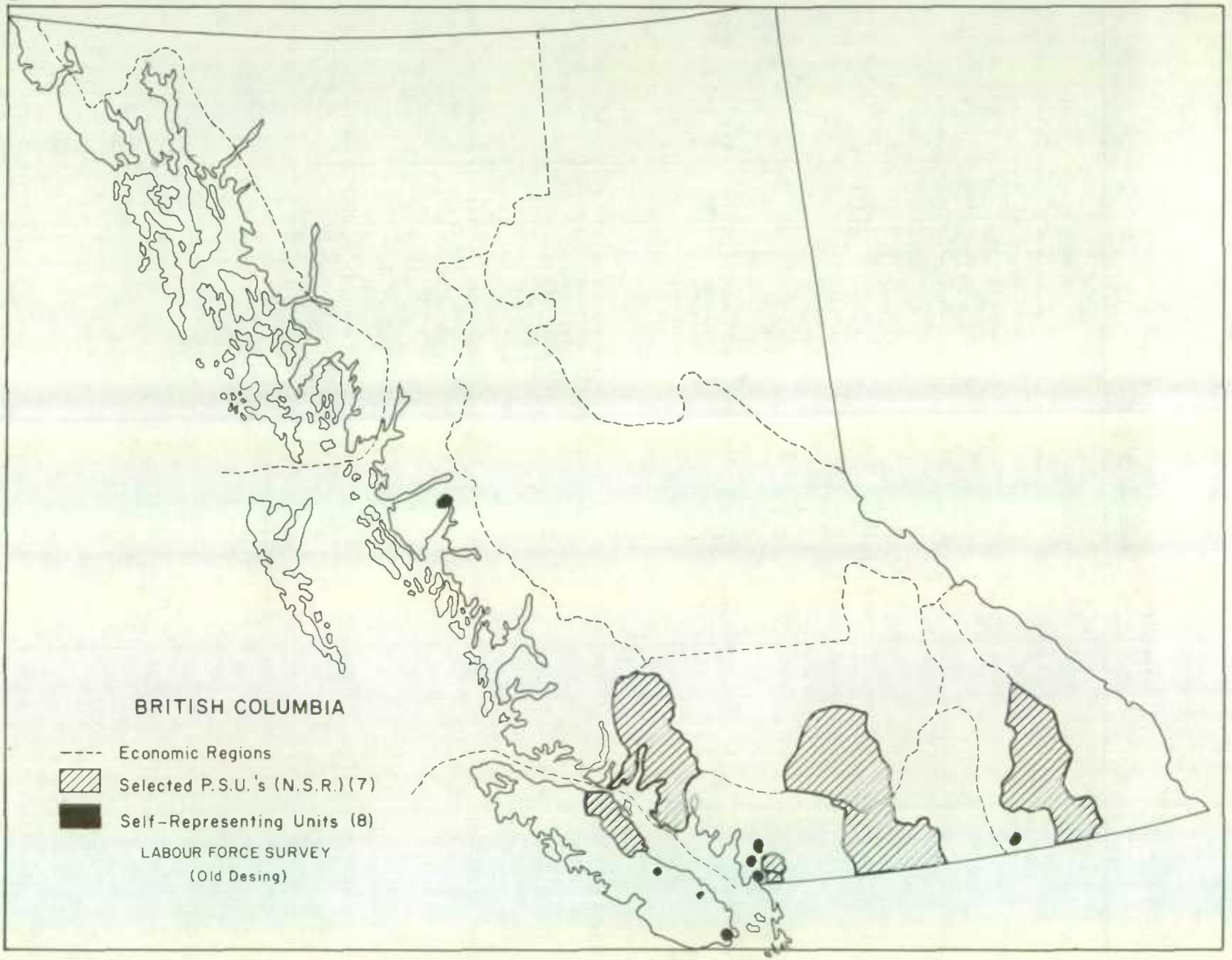
1. Labour Force Survey Design in British Columbia

(sampling ratio 0.7%)

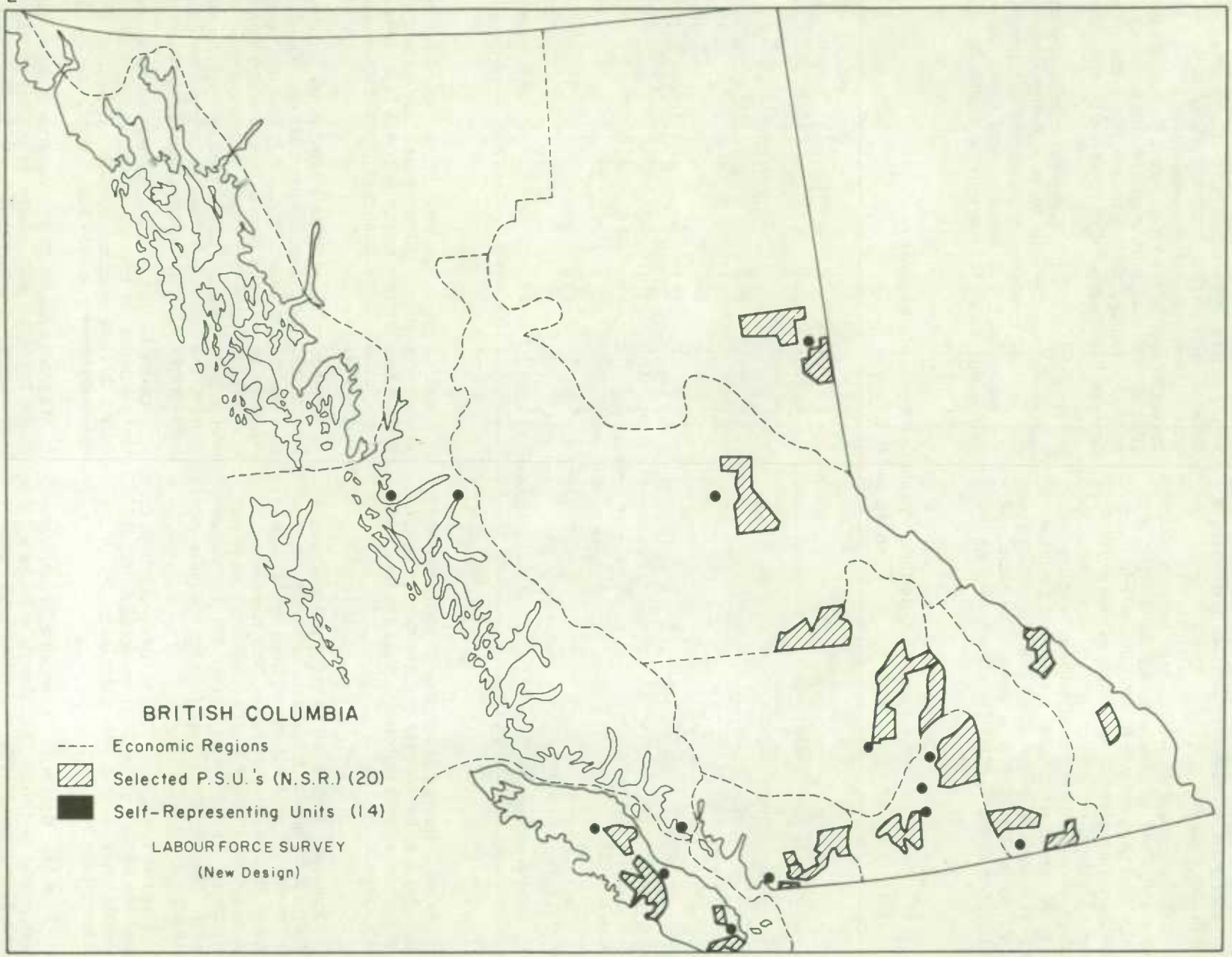
Stage of sampling	Self-representing areas			Non-self-representing areas		
	Nature of units	Size of units (pop.)	Method of selection	Nature of units	Size of units (pop.)	Method of selection
Stratum	Metropolitan area or special area	15,000 +	Certainty	Group of similar p.s.u.'s (geographically contiguous)	13,835 - 57,261	Certainty
First stage	Census tracts	15,000	Certainty	Rural enumeration areas and nearby small urban	2,116 - 3,909	Two units selected with p.p.s.
Second stage (segment)	City block(s)		p.p.s.[1] systematic	Rural enumeration area and small urban or part of it	Rural 600 Urban 700	Systematic p.p.s. within urban and rural
Third stage (cluster)	None	None	None	Small area with recognizable boundaries	Multiple of 3 or 4 H.H.'s	Random systematic (p.p.s. for multiple clusters)
Fourth stage (household)	Household	3 - 4	Random systematic	Household	3 - 4	Random systematic in multiple clusters

[1] p.p.s. = Probability proportional to size (1961 Census population).

2


BRITISH COLUMBIA
Economic Regions
Selected P.S.U.'s (N.S.R.) (7)
Self-Representing Units (8)
LABOUR FORCE SURVEY
(Old Desing)

2


BRITISH COLUMBIA
Economic Regions
Selected P.S.U.'s (N.S.R.) (20)
Self-Representing Units (14)
LABOUR FORCE SURVEY
(New Design)

3. Description of Economic Regions and Strata of British Columbia

Each economic region has been stratified separately and primary sampling units have been delineated independently of another economic region. Owing to the geographical nature of the province – mountains, valleys, large remote areas etc., the scope in the delineation of primary sampling units was very restricted. Great care had to be taken to ensure that travel was possible from one enumeration area to another within a primary sampling unit. Distances of travel within a primary sampling unit were generally greater than in other provinces, also distance between the rural and urban parts of a primary sampling unit was sometimes unavoidably large. Because of the type of area, it was not possible to obtain as satisfactory results with regards to the percentage of the Labour Force characteristics as have been required in most other provinces.

The following table shows the number of strata and primary sampling units for each economic region. The average population of strata (as described in the report on the Canadian Labour Force Survey (Methodology) page 10) was equal to 53,000 persons.

British Columbia – Number of Economic Regions, Strata and P.S.U.'s

Economic region	Stratum 1	Stratum 2	Total in economic region
	number of P.S.U.'s		
90	12	–	12
91	18	–	18
92	16	–	16
93	13	–	13
94	18	18	36
95	13	16	29
96 Remote Area	–	–	–
97	16	–	16
98	6	–	6
Total in province	–	–	**146**

In the following description of stratification of each region in the majority of cases the percentages of the three most important characteristics have been given.

Economic Region 90 is the south-east corner of British Columbia. It consists of census division 1. There are no self-representing units located within this economic region. The non-self-representing population is 33,882 which was made into 1 stratum. The important Labour Force characteristics are services, manufacturing durable and mining.

Stratum 1. – It has 33% of its population as rural and 67% as urban. Services accounts for 39%, manufacturing durable 16% and mining 15% of the Labour Force.

Economic Region 91 is situated in the south-eastern part of British Columbia. It is made up of census division 2. The self-representing area of Trail – Rossland is located within this region. The non-self-representing population total is 54,696 which was kept as 1 stratum. The main Labour Force characteristics are manufacturing durable, transportation and services.

Stratum 1. – It has 56% of its non-self-representing population in the rural areas and 44% in the urban areas. Services accounts for 41% of the Labour Force, manufacturing durable is 18% and transportation is 15%.

Economic Region 92 is located in the southern part of British Columbia – the Okanagan district. It is made up of census division 3. The three self-representing units of Kelowna, Penticton and Vernon are situated within this region. The non-self-representing population is 52,505 which was kept as one stratum. The important Labour Force characteristics are services, agriculture and manufacturing durable.

Stratum 1. – It has 68% of its non-self-representing population in the rural areas and 32% in the urban. Services accounts for 39%, agriculture 24% and manufacturing durable 13% of the Labour Force.

Economic Region 93 is situated north of Regions 92 and 94, in the south central part of the province. It is made up of census division 6. The self-representing unit of Kamloops is situated within this economic region. The non-self-representing population is 41,570 which was left as 1 stratum. The important Labour Force characteristics are services, manufacturing durable and agriculture.

Stratum 1.—It has 65% of its non-self-representing population in the rural areas and 35% in the urban areas. The largest portion of the Labour Force—34% is engaged in services, 22% is in manufacturing durable and 13% is in agriculture.

Economic Region 94 is the south-western corner of the mainland of British Columbia, the lower Fraser area. It is made up of census division 4. The metropolitan area of Vancouver City is the only self-representing unit in this region. The non-self-representing population is 112,662 which was divided into 2 strata. The Labour Force characteristics used for stratification were agriculture, forestry and fishing, and services.

Stratum 1.—It is a small area in the southern part of the region. The non-self-representing population is 55,401 of which 64% is rural and 36% is urban. Services accounts for 44%, agriculture 24% and manufacturing non-durable and transportation each are 7% of the Labour Force.

Stratum 2.—It is the northern, also the south-eastern and south-western part of the region. The non-self-representing population is 57,261 of which 67% is rural and 33% is urban. The largest part of the Labour Force—44% is engaged in services, 11% in both forestry and fishing and manufacturing durable. Transportation is worth noting with 10% of the Labour Force and agriculture with 9%.

Economic Region 95 is the whole of Vancouver Island. It is made up of census division 5. There are three self-representing areas in this region, they are Victoria, Nanaimo and Alberni. The non-self-representing population is 93,122 which was divided into 2 strata. The Labour Force characteristics used for stratification were forestry and fishing, manufacturing durable and services.

Stratum 1.—It is the southern part of Vancouver Island. The non-self-representing population is 41,962 of which 77% is rural and 23% is urban. Services accounts for 42% of the Labour Force, manufacturing durable takes 17% and forestry and fishing 14%.

Stratum 2.—It is the northern part of Vancouver Island and comprises about 4/5 of the island. The non-self-representing population is 51,160 of which 69% is rural and 31% is urban. The largest part of the Labour Force—35%—is engaged in services, forestry and fishing is next with 28% and manufacturing durable and manufacturing non-durable each have 10%.

Economic Region 96 is a long narrow region running north and south along the western boundary of the province from the northern border south to the Powell River area, including the Queen Charlotte Islands. It consists of census divisions 7 and 9. The self-representing areas of Kitimat, Prince Rupert City and Powell River are located within this region. The remaining part of this region is remote and will be sampled as a Special Remote Area.

Economic Region 97 is situated in the north central part of British Columbia. It is made up of census division 8. The self-representing area of Prince George City is located within this region. The non-self-representing population total is 52,658 which was kept as 1 stratum. The important Labour Force characteristics are manufacturing durable, transportation and services.

Stratum 1.—It has 66% of its non-self-representing population in the rural areas and 34% in the urban areas. The largest portion of the Labour Force—33% is employed in services, manufacturing durable is next with 31% and transportation is 14%.

Economic Region 98 covers a large area in the north-eastern part of British Columbia. It is made up of census division 10. The self-representing area of Dawson Creek City is situated within this region. A very large part of Region 98 is remote and will be sampled as a Special Remote Area. Population in this remote area is 4,904. The regular non-self-representing population is 13,835 which was handled as one stratum. The important Labour Force characistics are agriculture, services and transportation.

Stratum 1.—It has 44% of its non-self-representing population in rural areas and 56% in urban areas. The largest part of the Labour Force—35%—is employed in services, a close second is agriculture with 30% and third is transportation with 12%.

4. Special Features

(a) Population size of self-representing units was lowered in remote areas, for example:

Kitimat	8,217
Powell River	11,604
Dawson Creek	10,946

5. Self-representing Units in British Columbia (Total-14)

Economic region		Population
91	Trail-Rossland	15,934
92	Kelowna	14,199
	Penticton	13,859
	Vernon	12,374
93	Kamloops	18,607
94	Vancouver	777,979
95	Victoria	147,003
	Alberni-Port Alberni	16,176
	Nanaimo	18,031
96	Kitimat	8,217
	Prince Rupert	12,828
	Powell River	11,604
97	Prince George	16,458
98	Dawson Creek	10,946

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