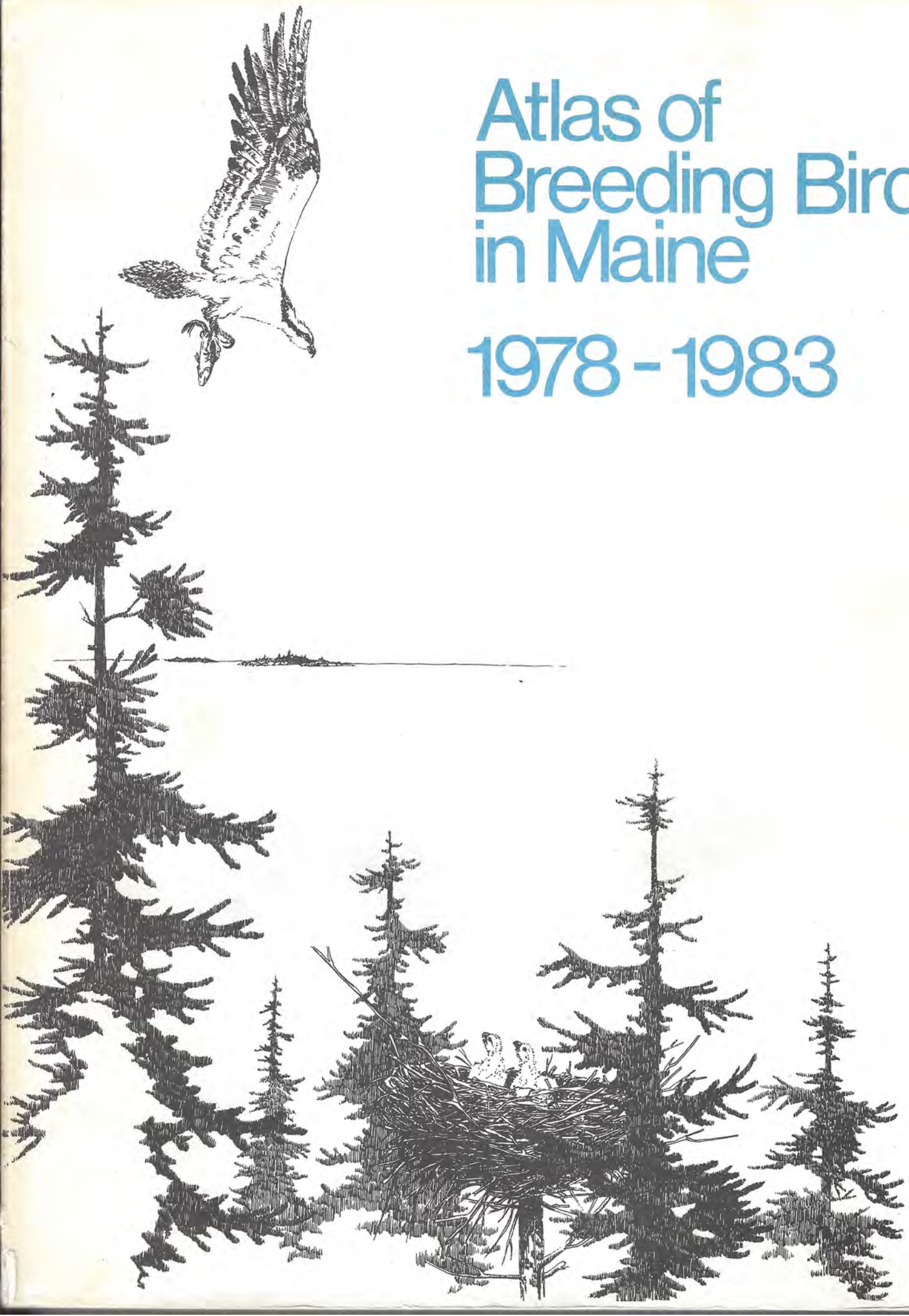
Atlas of Breeding Birds in Maine

1978 - 1983



Maine Fish and wildlife copy

ATLAS OF BREEDING BIRDS IN MAINE, 1978-1983

Paul R. Adamus
Principal Author/Compiler

Coordinated by:

The Maine Breeding Bird Atlas Committee: Paul Adamus, Bonnie Bochan (Coordinator), Peter Cannell (Coordinator), Peter Cross, Norman Famous, Michael Lucey, Stephen Oliveri, Jan Pierson, Liz Pierson, Peter Vickery, Stephen Weston, and Chuck Whitney.

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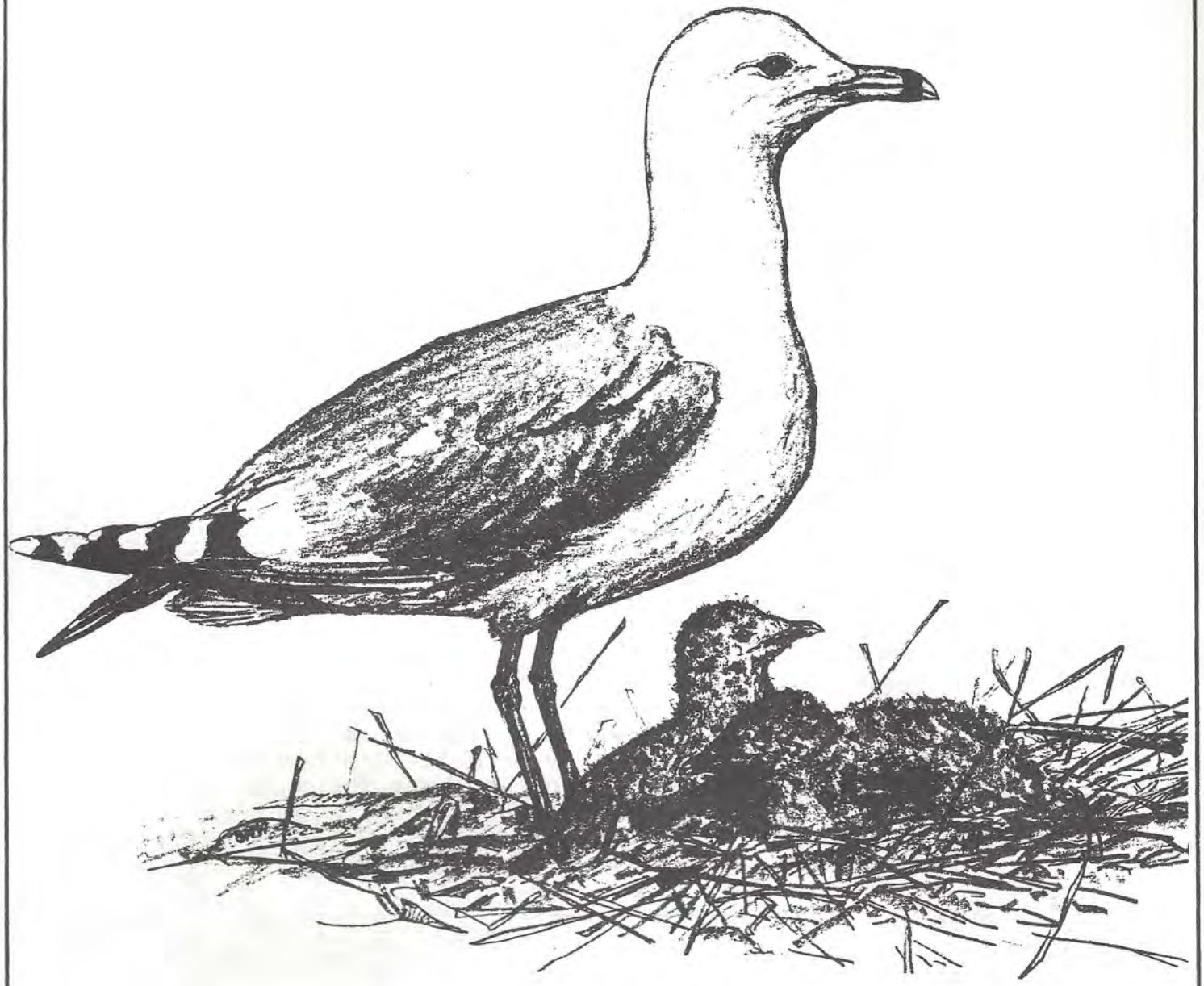

ATLAS OF BIRDS BREEDING IN MAINE 1978–1983

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PREFACE

Birds comprise the largest portion of our wildlife resource. This atlas depicts and analyzes the distribution of the 201 species of birds that nest in Maine. It is the product of an extensive, six-year effort organized and conducted primarily by volunteers. The project achieved minimal coverage of 39 percent of the state and resulted in discovery of 14 species previously undocumented as breeding in Maine.

This atlas should prove useful to personnel in the Maine Departments of Environmental Protection, Conservation, Inland Fisheries and Wildlife, Transportation, and others as well as to persons responsible for environmental permitting or land management in corporations, public interest groups, and local government.

Most human activities benefit some species while discouraging or having no effect on others; every acre cannot be made to serve the needs of all species. This atlas, by providing essential distribution data and demonstrating (in Appendix D) its application to environmental problem-solving, provides one means for resolving these trade-offs among species. Thus, the conservation of regional wildlife diversity is aided.

As demonstrated in Appendix D, information in this atlas can be used to help answer questions such as the following: Which of two (or more) alternate sites would be the better place to situate a particular road, timber harvesting operation, house lot, land fill, nature trail, or other facility? Which lake level or timber cutting cycle would be best? Which tract of land is more important to acquire for conservation purposes? Which species should our town conservation group strive to manage? What birds have been found in the area where we live?

The information in this atlas can also be used as a baseline against which to measure future changes in the resource potentially caused by agricultural land conversion, forest management, acid precipitation, pesticide use, climatic change, and other influences.

Finally, the atlas presents a bibliography of Maine ornithology, 1949-1984, and suggests ways that individuals can contribute to the growing scientific data base on Maine's birds.

Paul R. Adamus
Manchester, Maine

FOREWORD

The publication of this atlas is an important event in the history of Maine ornithology. An unprecedented level of detail about the distribution of Maine's breeding birds is now available, culminating six years of observation and compilation by a basically volunteer work force. It has been a labor of love, and provides yet another testimony to the importance of involving amateurs as well as professionals in field ornithological studies.

Breeding bird atlas information is useful at many levels and to many types of people. The individual species maps, the crux of the atlas, should give amateur naturalists an overview of state distribution patterns and indicate the proximity and limits of individual species' ranges. Time saved for researchers interested in particular species will be enormous. In fact, requests for preliminary range maps began to arrive during the first year of the project.

This atlas also provides area information: which species have been determined to breed in any one block or region. Such information, easily derived from Appendix E, has unfortunately been excluded from many atlas publications from other areas.

Breeding bird atlas data may provide a basis for investigating the patterns and causes of animal distribution, although data now available from numerous European atlas projects has rarely been analyzed at this level. Particularly as results from adjacent states and provinces are published, large scale distribution patterns will be available for analysis.

Besides the data itself, I see a second product represented here; one less tangible but no less important. A network of people interested in birds has now been created in Maine, consisting of both amateurs and professionals. The communication links that have been established will be vital to the future of Maine ornithology.

I close with thanks and with hopes. Thanks are due to every individual who participated in this project; I had the personal pleasure to meet or correspond with many. In 1978 I moved out of Maine, and my role in the project slowly diminished. This slack was more than filled by members of the Atlas Committee, and in particular by Bonnie Bochan and Paul Adamus; to these individuals I, and I believe all readers, owe a special debt.

This atlas must be viewed in many ways as a beginning. I have no doubt, and every hope, that its publication will spark a flurry of refinements, corrections, and further questions about the distribution of Maine's bird life. With this solid body of data and open channels of communication, I believe the door stands open to an even richer future for Maine ornithology.

Peter F. Cannell
New York, N.Y.

1.0 INTRODUCTION

1.1 Purpose

The Maine Breeding Bird Atlas was a six-year, volunteer effort to determine the geographic distribution of birds that nest in Maine. The Project represents a careful, qualitative survey. It has been modeled, with numerous adaptations, after similar projects in other states and foreign countries. No previous atlas efforts have been undertaken in Maine, and the atlas represents the most comprehensive source of distributional data on breeding species since the classic reference, Maine Birds (Palmer 1949) was published.

The atlas is intended to be useful both in land resource planning and in fostering the recreational enjoyment and appreciation of Maine's birds. Many birds are excellent indicators of environmental conditions. They can serve as a kind of early warning system for problems that may ultimately affect people. Moreover, birds are of important aesthetic, sporting, economic, and ecological value.

To detect long-term changes in bird communities, it is important to establish a baseline against which future conditions can be compared. We believe the atlas has provided such a baseline.

1.2 Methods

The atlas is based on the observations of over 200 volunteers (Appendix B) inhabiting a state as large in area as all five other New England states combined. The project was conducted without direction from government agencies or private institutions, and with a total budget of less than $10,000. The atlas was coordinated by, and the majority of the field work was accomplished by, the 12-member Atlas Committee. Its members, who represent each region of the state, communicated with volunteers, screened observations, published a newsletter, and helped edit the data. The number of volunteers increased over the six years of the effort. A major increase in effort occurred during the final two years as the Atlas Committee publicized the project more widely and procured limited financial support to cover expenses.

The atlasing effort mainly consisted of attempts to observe, list, and confirm breeding of all species

occurring in each of 706 rectangular "blocks" forming a grid that covered the entire state. Each block is approximately 58 square miles in size (about 6 miles by 8.5 miles) and its boundaries are defined by the 7.5 minute U. S. Geological Survey (USGS) topographic map, or one-quarter of the USGS 15-minute map. Where a topographic map included part of Canada or New Hampshire, only the Maine portion was atlased.

The atlasing effort was not distributed throughout the state in a scientifically random manner, nor was it, until the final year of the project, organized to provide even geographic coverage of the state. Most blocks were atlased in an opportunistic manner. Distribution of effort is summarized in the Results section.

Atlasing efforts focused on finding the full number of species in a block and on confirming the nesting of species that were found. The method of recording breeding evidence was carefully formalized. One of three documentation categories was assigned to each species found in a block, to reflect the maximum degree to which its breeding was established. These categories are as follows:

Confirmed. Active nest or other positive evidence of nesting was found.

Probable. One or more individuals of the species were present at the same site and with some permanency throughout the breeding season, in appropriate habitat; or, other suggestive but inconclusive evidence of breeding was obtained.

Possible. One or more individuals of the species were recorded in appropriate habitat once during any breeding season, but no other indication of breeding was obtained.

More specific behaviors used to define these categories are shown in Table 1.

The amount of effort devoted to each block varied, depending on proximity to observers, availability of public access roads, and other factors. The most comprehensive block lists were compiled where active birders resided or where detailed research or impact assessment studies were in progress. Relevant data collected by non-atlas participants for other purposes was included. The Atlas Committee gratefully acknowledges the privilege of using this additional

information. These data sources and the sponsoring agencies were as follows:

(Note: MAS = Maine Audubon Society, MDIFW = Maine Department of Inland Fisheries and Wildlife, USFWS = U. S. Fish and Wildlife Service)

-- colonial seabird surveys (MDIFW and USFWS)
-- inland waterfowl brood surveys (MDIFW)
-- osprey and eagle surveys (MDIFW and USFWS)
-- common loon surveys (MDIFW and MAS)
-- mourning dove and woodcock census routes (MDIFW)
-- breeding bird census routes (USFWS)
-- student theses at the University of Maine
-- White Mountains National Forest and other U. S. Forest Service bird studies

The amount of effort devoted to specific habitats within each blocks also varied. Although participants were encouraged to cover the full range of habitats present, wetlands, mountaintops, and forest interiors were less well covered. Moreover, because this was a distributional rather than an ecological study, no attempt was made to describe habitat present in each block or to investigate habitat requirements of species.

1.3 Quality of Data

In any project drawing data from over 200 persons it becomes critical to carefully screen reported observations. This is especially important if the results are to be used as a baseline. Thus, although the atlas project occasionally sought observations from non-birders, these reports were screened very carefully and only data on common species found in expected localities were used. Reports of rare or extralimital species were accepted only if the capability of the person making the observation was familiar to members of the Atlas Committee, and/or if submitted field notes and follow-up discussions with the observer were convincing. When possible, at least one Atlas Committee member visited the breeding site and corroborated the observation. All species found to be breeding in the state for the first time were verified by at least two competent observers.

1.4 Limitations of the Atlas

Users should be aware of the following limitations of the data:

1. Because the level of effort was not uniform, the presence or absence of a species in a SINGLE block alone usually has little biological significance. Rather, it is the OVERALL picture presented by a species occurring or being absent in SEVERAL clustered blocks which suggests genuine range distribution.

2. The species list for each block (as presented in Appendix E) is not comprehensive. For example, although users may wish to include the list for a block in an environmental impact statement to characterize the local bird community, it should be remembered that: a) other species were likely present but not noted; b) some listed species may not be present in the specific development area although present elsewhere in the block; and c) some listed species may no longer be present due to habitat changes or other factors that have occurred since the 1978-1983 period.

3. It should not be assumed that any block's habitat or bird community composition remained entirely constant throughout the six years of the project. The six-year period is a compromise between attaining adequate coverage of the state while not extending the project so long that the time frame becomes blurred and thus less valuable as a baseline.

4. Because this is an atlas of birds as they occur during the breeding season, no inferences should be made regarding the distribution of these and other species present in Maine at other seasons of the year.

2.0 RESULTS

A total of 201 species, 14 of them previously undocumented as breeding in Maine, were found. This total represents 50 percent of all birds that have ever been found in Maine at any season. The fourteen species previously undocumented as breeding in Maine are:

Great Cormorant	Wild Turkey (introduced)
Cattle Egret	Willow Flycatcher
Gadwall	Tufted Titmouse
Northern Shoveler	Blue-gray Gnatcatcher
Turkey Vulture	Blue-winged Warbler
Ring-billed Gull	Louisiana Waterthrush
Bonaparte's Gull	Fox Sparrow

In addition, the following species have been documented as nesting in Maine since publication of Palmer (1949) but prior to this Atlas effort: Glossy Ibis, Tricolored (Louisiana) Heron, Little Blue Heron, Snowy Egret, Mallard, American Wigeon, Willet, American Coot, Northern Cardinal, and House Finch.

All species believed to breed in Maine (Palmer 1949) were confirmed to still be nesting, with the following exceptions: Eastern Screech-Owl, Loggerhead Shrike, Sedge Wren, Red-headed Woodpecker, and Carolina Wren. Most of these were actually sighted during the atlas period somewhere in the state, but efforts to verify breeding were unsuccessful.

In addition, two species (Horned Grebe, and Common Barn-Owl) were confirmed breeding or attempting to breed in Maine after publication of Palmer (1949) but prior to and not during the atlas period.

Finally, Appendix A describes species that were recorded during the breeding season but which were not confirmed as breeding.

Coverage of the state is summarized in Table 2 and Figure 1. Of the 706 blocks encompassing the state's 33,000 square miles, 615 (87%) have some data. Some 273 (39%) received "minimum coverage" as defined by the Atlas Committee. The Atlas Committee's definition of a minimum coverage block was one in which 75 or more species were found, as this figure was believed to best represent the number of species that might be expected to be discovered by a "reasonable" effort in an <u>average</u> atlas block. Thus, any block meeting this criterion was termed a "minimum coverage block." In reality, some well-covered blocks had as many as 141 species (Table 2). Had an extremely intensive effort been made to atlas each block, most blocks might have been something closer to this higher figure.

This criterion does not reflect the degree to which the 75 species were actually confirmed as breeding. For this, the Committee assigned the term "adequate coverage". An adequate coverage block is one in which, of

the 75 or more species observed, at least 25 were confirmed as breeding while another 25 or more were "probable" and still another 25 or more were "possible." (see Methods section for definition of terms). Some 243 blocks (34% of all blocks) achieved adequate coverage status. They are denoted in Figure 1.

In every 4-block (232 sq. mi.) cluster in southern Maine (south of about 45 degrees latitude) and in every 16-block (4 by 4 blocks, 928 sq. mi.) in northern Maine, at least one block was targeted for the attained adequate status. This one block in each cluster was designated the "priority block" for purposes of achieving a relatively even distribution of effort throughout the state. These priority blocks are shown in the Index Map Overlay (Figure 4).

3.0 HOW TO USE THE ATLAS

The atlas has four major components. These are as follows:

1. Annotated Species Maps
2. Index Maps
3. Summary of Species Distribution
4. Block Bird Lists

3.1 Annotated Species Maps

The Annotated Species Maps, showing distribution of records, form the central feature of this atlas. A map is presented for nearly all of the 201 species found. The map shows all blocks in which the species was found, and uses graphic symbols to depict whether breeding was confirmed, probable, or possible.

Note also that light shading is used on the species maps to depict blocks that received minimum coverage (by the 75-species criterion explained above). When several contiguous blocks have this shade, but contain no other symbol, it suggests a) a probable discontinuity in the species' range, or b) less likely, a widespread inaccessibility of its habitat to observers, or c) a characteristic secretiveness or scarcity of the species. In contrast, the lack of any symbol in a block may just as likely be due to insufficient atlasing effort as to genuine absence.

To further minimize the chance that an absence of symbols on part of a species map might be misinterpreted as a species absence when it is in fact due to other factors, a "detectability score" has been assigned each species. This score is the sum of numerical points associated with the following two sets of criteria, termed "recognition score" and "habitat score."

Recognition Score

POINTS

3--Species often encountered and recognized by the general public (e.g., American Robin), OR large and open-country (e.g., Northern Harrier) or open water (e.g., Common Loon) dwelling species.

2--Species commonly recognized by most birders, either by sound or sight (e.g., Eastern Kingbird).

1--Species more often heard than seen, and some not familiar or detectable for many birders (e.g., Brown Creeper, wood warblers), and/or visual identification relatively difficult (e.g., Alder Flycatcher).

0-Secretive species (e.g., accipiters) or species that sing only nocturnally (owls) or infrequently (cuckoos) or with difficult to distinguish song (Philadelphia Vireo)

Habitat Score

3--Species occupying a habitat that has been relatively thoroughly inventoried (e.g., Bald Eagle, colonial seabirds).

2--Species inhabiting roadsides, forest edge, large lakes, or urban areas, or species of which a major portion of their habitat has been inventoried statewide as part of a systematic survey (e.g., Wood Duck).

1--Species not regularly seen or heard from roadsides OR species of which only a minor portion of their habitat has been inventoried statewide as part of a systematic survey (e.g., other waterfowl).

0--Species inhabiting wetlands, mountaintops, or other relatively inaccessible and/or specialized habitats, and not subject to any systematic inventories during the period of the Atlas Project.

For example, American Robin, since it is recognized by many non-birders, was assigned a recognition score of 3, and a habitat score of 2, since it typically occurs in edge habitats. Its total detectability score, then, was 5 (3 + 2). In contrast, Virginia Rail, which is characteristically secretive and prefers wetland habitats not covered by any inventory, was assigned a 0 for both recognition and habitat, for a total detectability score of 0.

Finally, many maps have a species annotation. The annotations briefly note if the species was peripheral, cite any appropriate quantitative data for Maine, and list relevant literature references, with emphasis on technical articles from Maine published since 1949. A peripheral specie is one that is at the geographic edge of its range. It may be at the southern edge (i.e., nests mainly to the north), northern edge (i.e., nests mainly to the south), or northeastern edge (i.e., nests mainly to the south, but some may nest in other Eastern states or provinces at a latitude higher or equal to that at which the species nests in Maine). A few species re termed "local" breeders, meaning that in most blocks in which they occur, they are found in a very small and often unpredictable portion of the land.

Also, the phrase "reaches the ... limit of its range" means that the species does not, anywhere else in New England or the Canadian Maritimes, breed farther north or south (whichever is noted) of its range limit within Maine. In contrast, the phrase "approaches the ... limit of its range" means that the species is found north to about the St. Lawrence River in Canada (northern limit species) or south to about southern New England (southern limit species). In all cases, it is important to understand that we are discussing the regular breeding status to the north or south; i.e., the sporadic breeding occurrence is not considered to constitute genuine bounds of the geographic range.

Quantitative data for Maine are presented when available in summary form. Where several years of equally comprehensive, quantitative data were available, data from the most recent atlas year (1978-1983) were used. In a few cases data from earlier or later years were used if more comprehensive than any available from the atlas period.

An absence of annotations implies that the species is not peripheral in Maine, and no quantitative data or appropriate references were available.

3.2 Index Maps

The index maps (Figures 3 and 4) are provided so users may determine the general location of an observation portrayed on the species maps. Conversely, the user may determine which block he or she resides in, and from that point ascertain which species have been reported. Instructions for use of the index maps are provided at the beginning of Figure 4.

3.3 Summaries of Species Distribution

Two tables summarizing species distributions are presented.

The first (Table 3) tallies the number and percent of blocks in which each species has occurred. These figures are also broken down by Wildlife Management Unit (WMU). The WMU's (Figure 2) are those delineated by the Maine Department of Inland Fisheries and Wildlife and used in their Species Plans and other documents. The eight WMU's are based on similarities of physiography, land use, human population, climate, soil, and forest type. Thus, bird communities in atlas blocks within a WMU are expected to be more similar than in blocks in different WMU's.

Also, within each WMU, the block tallies are broken down even further, to indicate the number and percent of the minimum coverage blocks in which a species was found. Both this and the breakdown by WMU were done such that species were ranked, without bias attributable to geographic differences in coverage, from most widespread to least widespread within the region (WMU) or state.

The second compilation (Table 4) ranks the <u>regions</u> for each species, listing first the WMU's where the species was most widely reported (as a percent of minimum coverage blocks). This ranking may reveal less conspicuous patterns in the geographic range of a species that may not be apparent from viewing the species maps.

3.4 Block Lists

For users wishing to review an entire species list for a single block, Appendix E provides this information in matrix format. To conserve space, species are listed in columns identified by a species abbreviation, and blocks are listed in rows identified by the assigned

block number. At the intersection of each column and row, a single number is printed to indicate whether breeding was confirmed (3), probable (2), or possible (1). Absence of data could indicate either lack of coverage of genuine absence of the species. Species names corresponding to the abbreviations are given in Appendix E and block locations are shown in Figures 3 and 4. Field sheets indicating the nature of the documentation (e.g., whether a confirmation was based on finding recently fledged young or a nest with young) have been placed in permanent repository with the Maine Department of Inland Fisheries and Wildlife, Bangor.

4.0 APPLICATIONS

Although in many cases human activities have benefitted birds, numerous stresses have also been created by these activities. Certain bird species might be especially vulnerable to specific environmental threats and thus can sometimes serve as indicators of long-term change in the ecosystem. An assumption is that a major population change in most species will at some point be manifested as a change in distribution (e.g., range shrinks as species becomes rarer, see Willcove and Terborgh 1984). Some examples of potential use of birds as indicators are as follows (no priorities are implied by the order of this listing, and only breeding species are included):

1. Possible indicators for acid precipitation, eutrophication, excessive recreational disturbance, or other freshwater alteration effects and trends on a cumulative regional basis: Common Loon, American Bittern, Green Heron, Rails, Common Snipe, Osprey, Belted Kingfisher, Marsh Wren, waterthrushes, common Yellowthroat, Lincoln's Sparrow.

2. Possible indicators for trends in agricultural land conversion and agricultural pesticide use: Upland Sandpiper, Horned Lark, Eastern Meadowlark, Field Sparrow, Vesper Sparrow, Savannah Sparrow, Boblink, Common Nighthawk.

3. Possible indicators for trends in silvicultural practices, forest fragmentation (i.e., species loss from cutting off corridors of habitat), local fuelwood harvesting, subdivision development, and recreational or other disturbance in forests, either in Maine or on their migration and wintering grounds: woodpeckers (snag availability), forest

raptors (disturbance), Blackburnian Warbler (fragmentation, mature class availability), Mourning Warbler (regeneration availability and herbicide effects), crossbills (conifer availability).

4. Possible indicators for forest insect infestation conditions: for budworm: Cape May Warbler, Bay-breasted Warbler, Tennessee Warbler; for gypsy moth: cuckoos.

5. Possible indicators for pesticide effects: raptors, canopy-feeding songbirds, Cedar Waxwing (potential loss of fruit set due to pesticide effects on pollinators).

6. Possible indicators for marine intertidal resource overharvesting, sea level rise, estuarine sediment budgets: herons and egrets, Sharp-tailed Sparrow.

7. Possible indicators for marine finfish conditions: Common Loon, cormorants, terns, Atlantic Puffin.

8. Possible indicators for marine planktonic conditions: Black Guillemot.

5.0 RESOURCES

A variety of materials and opportunities are available for persons wishing to learn more about various aspects of Maine's birdlife. References such as Field Guide to the Birds of North America (National Geographic Society 1983) illustrate the plumages of all species occurring in Maine. For auditory recognition of birds, the Peterson records (Houghton Mifflin Publishing Co., Boston) provide some coverage of nearly all of Maine's nesting species, while more in-depth coverage of (notably) the warblers and Fringillids is provided by the Federation of Ontario Naturalists (Toronto) series. For information on habitat and life history, Palmer's Maine Birds remains the classic work. Another, more recent compendium is Famous (1979). Additional references describing the habitat of particular species are provided in the annotations accompanying the species maps. Monthly presence or absence of species is depicted in Vickery (1977), Famous (1979), and Pierson and Pierson (1981). Also, migration and egg dates are cited in Palmer (1949) and can be extracted from the periodicals noted below.

Pierson and Pierson (1981) provides recent directions to some good birding localities, all on or near the coast. Pettingill (1977) includes a few inland areas as well. From the coastal bird inventories sponsored by the MDIFW (Hutchinson and Ferrero 1980, Hutchinson 1983), the locations of some of the largest concentrations of various bird groups (e.g., gulls, goldeneyes) can be extracted. Promising localities for particular species can also be extracted from the periodicals Maine Birdlife (P.O. Box 18, Winthrop 04364), The Guillemot (Box 373, Sorrento 04677), and American Birds (950 Third Ave., New York, NY 10022). Birding field trips in Maine are regularly sponsored by local Audubon Society chapters and national bird tour groups, as well as Maine Audubon Society (118 Route One, Falmouth 04105). The latter also sponsors a Bird Alert (phone 781-2332) with news of recent sightings.

The ranges of Maine's birds can be better understood by comparison with range and habitat maps for adjacent states and provinces. Relevant references are Godfrey (1972) for Quebec and Squires (1952) for New Brunswick. Atlas projects are now underway in New Hampshire, the Canadian Maritimes, and New York, and are nearing publication in Vermont and Massachusetts. These will provide invaluable data on species ranges in the Northeast.

6.0 THE FUTURE

In a sense, this atlas is a beginning. It represents one of the first times in Maine that virtually the entire ornithological community, both amateurs and professionals, has worked successfully together on a statewide basis toward the attainment of a vital goal: establishment of an ornithological baseline for Maine. The work does not end here.

There is much the individual can do to improve the data base on Maine birds. Specifically, and in priority order, birders should:

a) continue checking appropriate habitats and regions of the state for species never documented as breeding in Maine, e.g., Common Pintail, Merlin, American Oystercatcher, Short-eared Owl, Boreal owl, Golden-winged Warbler, and surely others; and species that formerly bred but have not been confirmed in recent years (e.g., Eastern Screech-Owl, Horned Grebe);

b) continue to delineate the distribution of species apparently new to the state (e.g., Turkey Vulture);

c) continue attempts to delineate the ranges of species with low detectability scores (e.g., Long-eared Owl);

d) report <u>any</u> species found during the breeding season, any year, in blocks that until now have received little or no coverage (see Figure 1 map). Please record such observations on copies of the data form (Appendix F) and forward them annually to Michael Lucey, Box 1480, RFD 3, Bangor 04401. Observations that fall under categories a, b, or c above should also be sent at once to <u>Maine Birdlife</u> or <u>The Guillemot</u>, and reported to the Maine Bird Alert (phone numbers and addresses given above).

Together, these data will be indispensable as a source of updated information for researchers and environmental planners. Efforts will soon be initiated to compile and publish a book covering the current status of non-breeding as well as breeding species. Also, more detailed statistical analyses of the atlas data set, relating it on a general scale to existing forest and land use conditions, is contemplated. Persons wishing to use the atlas computer tape for any reason may do so by making arrangements through the Endangered and Nongame Wildlife Program, Maine department of Inland Fisheries and Wildlife, Bangor, Maine.

Although another atlas project will not be formally undertaken in Maine until sufficient time has passed to make comparison to the 1978-1983 baseline useful for a trend analysis, continuing observations and comments received from users will greatly serve our evolving knowledge of the distribution of the birds of Maine.

7.0 TABLES AND FIGURES

Table 1. Criteria of Breeding Used by the Atlas Project

Possible Breeding

Bird recorded in breeding season in possible nesting habitat but with no other indication of breeding noted. Summering or non-breeding adults, including early or late suspected migrants, are NOT counted.

Probable Breeding

S Singing male present (or breeding calls heard) on more than one date in the same place; the farther apart the dates, the better the indication.

T Bird (or pair) apparently holding territory; may be observed as singing or as chasing of other individuals of the same species

D Courtship and display, or agitated behavior or anxiety calls from adults suggesting probable presence of nearby nest or young. Also brood patch or cloacal protuberance in trapped or netted birds.

N Visiting probable nest site.

B Nest building by woodpeckers and wrens. Woodpeckers may drill roost holes and wrens may build many nests.

Confirmed Breeding.

DD Distraction display or injury feigning; or coition. (Agitated behavior and/or anxiety calls are "D" only).

NB Nest building in all species except wrens and woodpeckers.

UN Used nest found. Code used with caution, nest guides consulted.

FE Female with egg in oviduct.

FL RECENTLY fledged young (including downy young of waterfowl, etc.). The fact that some species, e.g., swallows, blackbirds, may move some distance soon after fledging is noted.

FS Fecal sac being carried by adult.

FY Adult with food for young. Caution is exercised to avoid confusion with courtship feeding ("D"), and with species which may carry food long distances, e.g., terns.

ON Adult entering or leaving nest site, indicating occupied nest. Generally refers to hole nesters going into a hole and remaining some time.

NE Nest and eggs or bird sitting on nest, or eggshells found below nest. Caution is exercised not to remain near nest or cause disruption of protective vegetation.

NY Nest with young or downy young of waterfowl, waders, etc.

Table 2. Summary of Coverage by Region

# of Species Found	Region (WMU)	# of Blocks
1 to 29	1	30
	2	50
	3	14
	4	18
	5	18
	6	13
	7	6
	8	6
30 to 49	1	9
	2	21
	3	15
	4	16
	5	6
	6	1
	7	6
	8	6
50 to 74	1	10
	2	23
	3	14
	4	24
	5	6
	6	16
	7	16
	8	15
75 to 99	1	11
	2	37
	3	24
	4	34
	5	9
	6	19
	7	22
	8	24
100 or more	1	9
	2	5
	3	7
	4	17
	5	6
	6	24
	7	6
	8	17

Table 3. Species Rankings within Regions

The following pages contain eight species lists, one for each of the eight regions (wildlife management units, or WMU's) of the state. Location of the regions is shown on the map, Figure 2.

In each list, the species that were found to be most widespread in that region are listed first, and those most local in distribution are listed last. The rankings which these lists are based upon have been adjusted to account for the fact that some regions and blocks were covered more thoroughly than others. The basis for the rankings in each case was the percentage of minimum coverage blocks (see p. 7 for definition) in that region, in which the species occurred. In cases of tied rank resulting from use of this criterion, a secondary criterion, percentage of all blocks in that region, was used to rank species.

In the following pages, the first column to the right of the species name is the number of minimum coverage blocks in which the species occurred. The second column is the percentage, defined as the number in column 1 divided by the number of minimum coverage blocks in the region. Column 3 is the total number of blocks in the region in which it occurred, and column 4 is the percentage, defined as the number in column 3 divided by the total number of all blocks encompassed in the region.

These rankings present a remarkably accurate picture of relative range extent (ubiquity). Although species abundance is not always correlated with ubiquity, the relationship in the case of these data is usually a close one, and we can say with reasonable certainty that species occurring in, say, less than 20 percent of the minimum coverage blocks are indeed rare or at least highly colonial or unusually difficult to detect.

Region 1

Table 3 (continued)

SPECIES	Minimum Coverage Blocks In Which Species Present #	%	All Blocks In Which Present #	%
Robin, American	19	100.000	52	75.362
Blackbird, Red-winged	19	100.000	47	68.116
Swallow, Barn	19	100.000	44	63.768
Crow, American	19	100.000	44	63.768
Jay, Blue	19	100.000	43	62.319
Sparrow, White-throated	19	100.000	42	60.870
Chickadee, Black-capped	19	100.000	41	59.420
Yellowthroat, Common	19	100.000	41	59.420
Raven, Common	19	100.000	41	59.420
Sparrow, Song	19	100.000	39	56.522
Grackle, Common	19	100.000	39	56.522
Veery	19	100.000	38	55.072
Grosbeak, Rose-breasted	19	100.000	38	55.072
Waterthrush, Northern	19	100.000	37	53.623
Grosbeak, Evening	19	100.000	36	52.174
Kingbird, Eastern	19	100.000	36	52.174
Killdeer	19	100.000	36	52.174
Redstart, American	19	100.000	35	50.725
Sparrow, Chipping	19	100.000	35	50.725
Waxwing, Cedar	19	100.000	34	49.275
Cowbird, Brown-headed	19	100.000	34	49.275
Goldfinch, American	19	100.000	33	47.826
Finch, Purple	19	100.000	33	47.826
Flicker, Northern	19	100.000	33	47.826
Warbler, Chestnut-sided	19	100.000	32	46.377
Parula, Northern	19	100.000	32	46.377
Warbler, Black-and-White	19	100.000	32	46.377
Kingfisher, Belted	19	100.000	32	46.377
Flycatcher, Least	19	100.000	31	44.928
Catbird, Grey	19	100.000	29	42.029
Woodpecker, Downy	19	100.000	24	34.783
Woodpecker, Hairy	19	100.000	24	34.783
Starling, European	18	94.737	42	60.870
Bobolink	18	94.737	39	56.522
Swallow, Tree	18	94.737	38	55.072
Ovenbird	18	94.737	37	53.623
Vireo, Red-eyed	18	94.737	36	52.174
Pewee, Eastern Wood	18	94.737	35	50.725
Warbler, Yellow	18	94.737	34	49.275
Warbler, Nashville	18	94.737	32	46.377
Vireo, Solitary	18	94.737	32	46.377
Junco, Dark-eyed	18	94.737	31	44.928
Sapsucker, Yellow-bellied	18	94.737	31	44.928
Flycatcher, Alder	18	94.737	30	43.478
Duck, American Black	17	89.474	45	65.217
Sparrow, Savannah	17	89.474	34	49.275
Dove, Mourning	17	89.474	34	49.275
Warbler, Magnolia	17	89.474	32	46.377
Warbler, Yellow-rumped	17	89.474	32	46.377
Thrush, Hermit	17	89.474	31	44.928
Warbler, Black-thr.Green	17	89.474	28	40.580
Kestrel, American	17	89.474	28	40.580

SPECIES	Minimum Coverage Blocks In Which Species Present #	%	All Blocks In Which Present #	%
Kinglet, Ruby-crowned	17	89.474	27	39.130
Warbler, Blackburnian	17	89.474	27	39.130
Thrush, Wood	17	89.474	26	37.681
Hummingbird, Ruby-throated	17	89.474	25	36.232
Sandpiper, Spotted	17	89.474	24	34.783
Grouse, Ruffed	16	84.211	40	57.971
Warbler, Canada	16	84.211	29	42.029
Wren, Winter	16	84.211	27	39.130
Warbler, Tennessee	16	84.211	26	37.681
Swift, Chimney	16	84.211	22	31.884
Warbler, Cape May	16	84.211	21	30.435
Kinglet, Golden-crowned	16	84.211	20	28.986
Snipe, Common	15	78.947	29	42.029
Tanager, Scarlet	15	78.947	27	39.130
Nuthatch, Red-breasted	15	78.947	22	31.884
Swallow, Bank	15	78.947	21	30.435
Oriole, Northern	14	73.684	30	43.478
Thrush, Swainson's	14	73.684	28	40.580
Sparrow, House	14	73.684	27	39.130
Heron, Great Blue	14	73.684	25	36.232
Harrier, Northern	14	73.684	22	31.884
Hawk, Broad-winged	14	73.684	17	24.638
Woodcock, American	13	68.421	29	42.029
Merganser, Common	13	68.421	25	36.232
Warbler, Black-thr. Blue	13	68.421	23	33.333
Dove, Rock	13	68.421	23	33.333
Swallow, Cliff	13	68.421	20	28.986
Warbler, Bay-breasted	13	68.421	19	27.536
Sparrow, Swamp	13	68.421	19	27.536
Phoebe, Eastern	13	68.421	19	27.536
Siskin, Pine	13	68.421	15	21.739
Osprey	12	63.158	25	36.232
Flycatcher, Olive-sided	12	63.158	22	31.884
Flycatcher, Great Crested	12	63.158	17	24.638
Vireo, Warbling	12	63.158	16	23.188
Woodpecker, Pileated	11	57.895	26	37.681
Loon, Common	11	57.895	25	36.232
Bittern, American	11	57.895	19	27.536
Cuckoo, Black-billed	11	57.895	18	26.087
Flycatcher, Yellowbellied	11	57.895	17	24.638
Chickadee, Boreal	11	57.895	13	18.841
Creeper, Brown	11	57.895	12	17.391
Nighthawk, Common	11	57.895	12	17.391
Woodpecker, Black-backed	11	57.895	12	17.391
Hawk, Sharp-shinned	11	57.895	12	17.391
Jay, Grey	10	52.632	29	42.029
Duck, Wood	10	52.632	22	31.884
Owl, Barred	10	52.632	17	24.638
Merganser, Hooded	10	52.632	16	23.188
Duck, Ring-necked	9	47.368	20	28.986
Sparrow, Lincoln's	9	47.368	16	23.188
Owl, Great-horned	9	47.368	16	23.188

Table 3 (continued)

Region 1 (continued)

SPECIES	Minimum Coverage Blocks In Which Species Present #	%	All Blocks In Which Present #	%
Teal, Green-winged	9	47.368	14	20.290
Warbler, Mourning	9	47.368	12	17.391
Goldeneye, Common	9	47.368	12	17.391
Mallard	9	47.368	11	15.942
Hawk, Red-tailed	8	42.105	14	20.290
Sparrow, Vesper	7	36.842	12	17.391
Teal, Blue-winged	7	36.842	12	17.391
Mockingbird	7	36.842	9	13.043
Warbler, Blackpoll	7	36.842	9	13.043
Grouse, Spruce	6	31.579	10	14.493
Grebe,Pied-billed	6	31.579	9	13.043
Warbler, Wilson's	5	26.316	9	13.043
Goshawk, Northern	5	26.316	6	8.696
Goose, Canada	5	26.316	6	8.696
Tern, Common	5	26.316	6	8.696
Owl, Northern Saw-whet	4	21.053	8	11.594
Heron,Black-crowned Night	4	21.053	8	11.594
Bunting, Indigo	4	21.053	7	10.145
Blackbird, Rusty	4	21.053	6	8.696
Meadowlark, Eastern	4	21.053	6	8.696
Lark, Horned	4	21.053	6	8.696
Nuthatch, White-breasted	4	21.053	5	7.246
Whip-poor-will	4	21.053	4	5.797
Vireo, Philadelphia	3	15.789	6	8.696
Warbler, Palm	3	15.789	5	7.246
Thrasher, Brown	3	15.789	4	5.797
Cormorant, Dbl-crested	3	15.789	4	5.797
Cuckoo, Yellow-billed	3	15.789	3	4.348
Heron, Green-backed	2	10.526	7	10.145
Sora	2	10.526	5	7.246
Martin, Purple	2	10.526	4	5.797
Eagle, Bald	2	10.526	4	5.797
Hawk, Red-shouldered	2	10.526	3	4.348
Wigeon, American	2	10.526	3	4.348
Swallow, N. Rough-winged	2	10.526	2	2.899
Crossbill, White-winged	2	10.526	2	2.899
Grosbeak, Pine	2	10.526	2	2.899
Sandpiper, Upland	2	10.526	2	2.899
Moorhen, Common	2	10.526	2	2.899
Gull, Ring-billed	2	10.526	2	2.899
Gull, Herring	2	10.526	2	2.899
Bluebird, Eastern	1	5.263	3	4.348
Hawk, Cooper's	1	5.263	2	2.899
Wren, House	1	5.263	1	1.449
Warbler, Pine	1	5.263	1	1.449
Flycatcher, Willow	1	5.263	1	1.449
Woodpecker, Three-toed	1	5.263	1	1.449
Shoveler, Northern	1	5.263	1	1.449
Merganser, Red-breasted	1	5.263	1	1.449

Region 2

Table 3 (continued)

SPECIES	Minimum Coverage Blocks In Which Species Present #	%	All Blocks In Which Present #	%
Sparrow, White-throated	35	100.000	99	72.794
Robin, American	35	100.000	91	66.912
Grosbeak, Evening	35	100.000	91	66.912
Yellowthroat, Common	35	100.000	90	66.176
Thrush, Swainson's	35	100.000	87	63.971
Finch, Purple	35	100.000	87	63.971
Warbler, Yellow-rumped	35	100.000	86	63.235
Redstart, American	35	100.000	85	62.500
Jay, Blue	35	100.000	85	62.500
Grosbeak, Rose-breasted	35	100.000	84	61.765
Chickadee, Black-capped	35	100.000	79	58.088
Swallow, Tree	35	100.000	78	57.353
Grackle, Common	35	100.000	78	57.353
Sapsucker, Yellow-bellied	35	100.000	78	57.353
Waxwing, Cedar	35	100.000	74	54.412
Swallow, Barn	35	100.000	74	54.412
Grouse, Ruffed	35	100.000	68	50.000
Woodpecker, Pileated	35	100.000	59	43.382
Parula, Northern	34	97.143	89	65.441
Junco, Dark-eyed	34	97.143	89	65.441
Warbler, Blackburnian	34	97.143	87	63.971
Ovenbird	34	97.143	86	63.235
Warbler, Magnolia	34	97.143	86	63.235
Kinglet, Ruby-crowned	34	97.143	79	58.088
Sparrow, Chipping	34	97.143	79	58.088
Warbler, Canada	34	97.143	77	56.618
Nuthatch, Red-breasted	34	97.143	75	55.147
Raven, Common	34	97.143	74	54.412
Sparrow, Song	34	97.143	71	52.206
Jay, Grey	34	97.143	60	44.118
Hawk, Broad-winged	34	97.143	50	36.765
Warbler, Nashville	33	94.286	82	60.294
Flicker, Northern	33	94.286	74	54.412
Blackbird, Red-winged	33	94.286	73	53.676
Warbler, Bay-breasted	33	94.286	72	52.941
Warbler, Black-thr. Blue	33	94.286	69	50.735
Warbler, Chestnut-sided	33	94.286	64	47.059
Waterthrush, Northern	33	94.286	62	45.588
Woodpecker, Hairy	33	94.286	61	44.853
Crow, American	33	94.286	59	43.382
Wren, Winter	32	91.429	85	62.500
Vireo, Red-eyed	32	91.429	82	60.294
Warbler, Black-thr.Green	32	91.429	76	55.882
Flycatcher, Least	32	91.429	74	54.412
Veery	32	91.429	72	52.941
Sandpiper, Spotted	32	91.429	62	45.588
Kingfisher, Belted	32	91.429	60	44.118
Kingbird, Eastern	32	91.429	57	41.912
Loon, Common	31	88.571	82	60.294
Warbler, Tennessee	31	88.571	77	56.618
Vireo, Solitary	31	88.571	74	54.412
Flycatcher, Olive-sided	31	88.571	60	44.118

SPECIES	Minimum Coverage Blocks In Which Species Present #	%	All Blocks In Which Present #	%
Tanager, Scarlet	31	88.571	56	41.176
Swift, Chimney	31	88.571	54	39.706
Merganser, Common	31	88.571	50	36.765
Goldfinch, American	31	88.571	46	33.824
Thrush, Hermit	30	85.714	67	49.265
Osprey	30	85.714	63	46.324
Warbler, Mourning	30	85.714	62	45.588
Siskin, Pine	30	85.714	61	44.853
Woodpecker, Downy	30	85.714	54	39.706
Chickadee, Boreal	30	85.714	50	36.765
Woodpecker, Black-backed	30	85.714	50	36.765
Warbler, Cape May	29	82.857	67	49.265
Pewee, Eastern Wood	29	82.857	54	39.706
Hummingbird, Ruby-throatd	29	82.857	44	32.353
Warbler, Black-and-White	28	80.000	54	39.706
Duck, American Black	28	80.000	46	33.824
Kinglet, Golden-crowned	27	77.143	50	36.765
Heron, Great Blue	27	77.143	45	33.088
Sparrow, Swamp	26	74.286	44	32.353
Catbird, Grey	26	74.286	42	30.882
Woodcock, American	26	74.286	38	27.941
Thrush, Wood	25	71.429	54	39.706
Flycatcher, Alder	25	71.429	49	36.029
Creeper, Brown	24	68.571	41	30.147
Flycatcher, Yellowbellied	24	68.571	36	26.471
Warbler, Wilson's	22	62.857	36	26.471
Grouse, Spruce	22	62.857	32	23.529
Bittern, American	22	62.857	32	23.529
Goldeneye, Common	21	60.000	40	29.412
Swallow, Cliff	21	60.000	27	19.853
Sparrow, Lincoln's	20	57.143	41	30.147
Hawk, Red-tailed	20	57.143	39	28.676
Snipe, Common	19	54.286	39	28.676
Kestrel, American	18	51.429	28	20.588
Cowbird, Brown-headed	18	51.429	27	19.853
Nighthawk, Common	18	51.429	26	19.118
Duck, Ring-necked	17	48.571	28	20.588
Blackbird, Rusty	17	48.571	26	19.118
Bobolink	17	48.571	24	17.647
Hawk, Sharp-shinned	17	48.571	22	16.176
Killdeer	16	45.714	28	20.588
Gull, Herring	15	42.857	32	23.529
Starling, European	15	42.857	22	16.176
Warbler, Blackpoll	15	42.857	21	15.441
Duck, Wood	14	40.000	25	18.382
Grosbeak, Pine	14	40.000	20	14.706
Swallow, Bank	13	37.143	19	13.971
Merganser, Hooded	12	34.286	29	21.324
Eagle, Bald	12	34.286	24	17.647
Warbler, Yellow	12	34.286	22	16.176
Goshawk, Northern	12	34.286	18	13.235
Flycatcher, Great Crested	12	34.286	16	11.765

Table 3 (continued)

Region 2 (continued)

SPECIES	Minimum Coverage Blocks In Which Species Present #	%	All Blocks In Which Present #	%
Owl, Barred	12	34.286	13	9.559
Tern, Common	11	31.429	21	15.441
Phoebe, Eastern	11	31.429	17	12.500
Vireo, Philadelphia	11	31.429	16	11.765
Woodpecker, Three-toed	10	28.571	16	11.765
Warbler, Palm	10	28.571	15	11.029
Owl, Great-horned	9	25.714	13	9.559
Oriole, Northern	9	25.714	10	7.353
Sparrow, Savannah	7	20.000	15	11.029
Teal, Green-winged	7	20.000	11	8.088
Goose, Canada	7	20.000	10	7.353
Crossbill, White-winged	7	20.000	9	6.618
Owl, Northern Saw-whet	6	17.143	11	8.088
Harrier, Northern	6	17.143	8	5.882
Vireo, Warbling	6	17.143	6	4.412
Mallard	5	14.286	11	8.088
Teal, Blue-winged	5	14.286	10	7.353
Hawk, Cooper's	5	14.286	7	5.147
Merganser, Red-breasted	5	14.286	7	5.147
Sparrow, House	5	14.286	6	4.412
Gull, Ring-billed	4	11.429	8	5.882
Bunting, Indigo	4	11.429	5	3.676
Hawk, Red-shouldered	4	11.429	5	3.676
Crossbill, Red	4	11.429	4	2.941
Whip-poor-will	3	8.571	5	3.676
Bluebird, Eastern	3	8.571	3	2.206
Thrush, Grey-cheeked	3	8.571	3	2.206
Rail, Virginia	3	8.571	3	2.206
Nuthatch, White-breasted	2	5.714	6	4.412
Dove, Mourning	2	5.714	6	4.412
Heron,Black-crowned Night	2	5.714	4	2.941
Thrasher, Brown	2	5.714	3	2.206
Meadowlark, Eastern	2	5.714	3	2.206
Heron, Green-backed	2	5.714	3	2.206
Grebe,Pied-billed	2	5.714	3	2.206
Wren, House	2	5.714	2	1.471
Sparrow, Fox	2	5.714	2	1.471
Cormorant, Dbl-crested	2	5.714	2	1.471
Gull, Bonaparte's	2	5.714	2	1.471
Warbler, Pine	1	2.857	3	2.206
Cuckoo, Black-billed	1	2.857	3	2.206
Wren, Marsh	1	2.857	1	0.735
Mockingbird	1	2.857	1	0.735
Pipit, Water	1	2.857	1	0.735
Swallow, N. Rough-winged	1	2.857	1	0.735
Towhee, Rufous-sided	1	2.857	1	0.735
Cuckoo, Yellow-billed	1	2.857	1	0.735
Dove, Rock	1	2.857	1	0.735
Gull, Great Black-blacked	1	2.857	1	0.735

Table 3 (continued)

Region 3

SPECIES	Minimum Coverage Blocks In Which Species Present #	%	All Blocks In Which Present #	%
Sparrow, White-throated	30	100.000	64	86.486
Robin, American	30	100.000	62	83.784
Yellowthroat, Common	30	100.000	62	83.784
Swallow, Tree	30	100.000	60	81.081
Waxwing, Cedar	30	100.000	59	79.730
Finch, Purple	30	100.000	59	79.730
Veery	30	100.000	58	78.378
Jay, Blue	30	100.000	58	78.378
Blackbird, Red-winged	30	100.000	56	75.676
Grosbeak, Rose-breasted	30	100.000	55	74.324
Sparrow, Song	30	100.000	55	74.324
Flicker, Northern	30	100.000	55	74.324
Swallow, Barn	30	100.000	50	67.568
Raven, Common	30	100.000	49	66.216
Catbird, Grey	30	100.000	44	59.459
Redstart, American	29	96.667	59	79.730
Ovenbird	29	96.667	59	79.730
Warbler, Magnolia	29	96.667	59	79.730
Warbler, Yellow-rumped	29	96.667	59	79.730
Chickadee, Black-capped	29	96.667	57	77.027
Sparrow, Chipping	29	96.667	56	75.676
Grackle, Common	29	96.667	54	72.973
Junco, Dark-eyed	29	96.667	53	71.622
Crow, American	29	96.667	53	71.622
Warbler, Chestnut-sided	29	96.667	52	70.270
Woodpecker, Hairy	29	96.667	50	67.568
Nuthatch, Red-breasted	29	96.667	48	64.865
Warbler, Nashville	28	93.333	58	78.378
Parula, Northern	28	93.333	55	74.324
Flycatcher, Least	28	93.333	55	74.324
Thrush, Hermit	28	93.333	53	71.622
Grosbeak, Evening	28	93.333	50	67.568
Warbler, Black-and-white	28	93.333	49	66.216
Woodpecker, Downy	28	93.333	44	59.459
Goldfinch, American	28	93.333	43	58.108
Kingfisher, Belted	28	93.333	43	58.108
Grouse, Ruffed	28	93.333	43	58.108
Pewee, Eastern Wood	28	93.333	42	56.757
Vireo, Red-eyed	27	90.000	57	77.027
Warbler, Blackburnian	27	90.000	50	67.568
Sapsucker, Yellow-bellied	27	90.000	49	66.216
Warbler, Black-thr. Blue	27	90.000	46	62.162
Warbler, Canada	27	90.000	45	60.811
Warbler, Black-thr.Green	27	90.000	41	55.405
Hummingbird, Ruby-throated	27	90.000	39	52.703
Thrush, Swainson's	26	86.667	49	66.216
Vireo, Solitary	26	86.667	49	66.216
Kingbird, Eastern	26	86.667	44	59.459
Wren, Winter	25	83.333	52	70.270
Loon, Common	25	83.333	44	59.459
Heron, Great Blue	25	83.333	33	44.595
Woodpecker, Pileated	24	80.000	38	51.351

SPECIES	Minimum Coverage Blocks In Which Species Present #	%	All Blocks In Which Present #	%
Warbler, Bay-breasted	24	80.000	36	48.649
Sparrow, Swamp	24	80.000	36	48.649
Swift, Chimney	24	80.000	35	47.297
Siskin, Pine	24	80.000	31	41.892
Thrush, Wood	23	76.667	44	59.459
Waterthrush, Northern	23	76.667	39	52.703
Hawk, Broad-winged	23	76.667	38	51.351
Kinglet, Ruby-crowned	23	76.667	34	45.946
Flycatcher, Alder	23	76.667	30	40.541
Duck, American Black	22	73.333	36	48.649
Tanager, Scarlet	22	73.333	34	45.946
Swallow, Bank	22	73.333	28	37.838
Chickadee, Boreal	22	73.333	24	32.432
Flycatcher, Yellowbellied	21	70.000	31	41.892
Warbler, Cape May	21	70.000	28	37.838
Woodcock, American	21	70.000	28	37.838
Kinglet, Golden-crowned	21	70.000	27	36.486
Merganser, Common	21	70.000	26	35.135
Creeper, Brown	21	70.000	25	33.784
Cowbird, Brown-headed	20	66.667	32	43.243
Phoebe, Eastern	20	66.667	31	41.892
Warbler, Tennessee	19	63.333	32	43.243
Warbler, Yellow	19	63.333	28	37.838
Oriole, Northern	19	63.333	27	36.486
Killdeer	19	63.333	27	36.486
Flycatcher, Great Crested	19	63.333	26	35.135
Grouse, Spruce	19	63.333	22	29.730
Swallow, Cliff	18	60.000	30	40.541
Bobolink	18	60.000	26	35.135
Flycatcher, Olive-sided	18	60.000	26	35.135
Sandpiper, Spotted	18	60.000	25	33.784
Woodpecker, Black-backed	18	60.000	23	31.081
Snipe, Common	18	60.000	23	31.081
Starling, European	17	56.667	29	39.189
Kestrel, American	17	56.667	25	33.784
Bittern, American	17	56.667	20	27.027
Duck, Wood	16	53.333	21	28.378
Osprey	16	53.333	20	27.027
Hawk, Red-tailed	16	53.333	16	21.622
Jay, Grey	15	50.000	19	25.676
Sparrow, Lincoln's	14	46.667	22	29.730
Owl, Great-horned	14	46.667	19	25.676
Owl, Barred	14	46.667	19	25.676
Nuthatch, White-breasted	13	43.333	23	31.081
Dove, Mourning	13	43.333	19	25.676
Sparrow, Savannah	13	43.333	18	24.324
Bunting, Indigo	12	40.000	18	24.324
Duck, Ring-necked	12	40.000	18	24.324
Goldeneye, Common	12	40.000	17	22.973
Thrasher, Brown	12	40.000	16	21.622
Mallard	12	40.000	13	17.568
Gull, Herring	12	40.000	13	17.568

Region 3 (continued)

Table 3 (continued)

SPECIES	Minimum Coverage Blocks In Which Species Present #	%	All Blocks In Which Present #	%
Warbler, Mourning	11	36.667	17	22.973
Wren, House	11	36.667	16	21.622
Merganser, Hooded	11	36.667	15	20.270
Bluebird, Eastern	11	36.667	14	18.919
Blackbird, Rusty	10	33.333	13	17.568
Warbler, Blackpoll	9	30.000	11	14.865
Vireo, Warbling	9	30.000	11	14.865
Meadowlark, Eastern	8	26.667	13	17.568
Sparrow, House	8	26.667	12	16.216
Mockingbird	8	26.667	9	12.162
Towhee, Rufous-sided	8	26.667	9	12.162
Whip-poor-will	8	26.667	9	12.162
Warbler, Pine	8	26.667	8	10.811
Nighthawk, Common	8	26.667	8	10.811
Cuckoo, Black-billed	8	26.667	8	10.811
Goose, Canada	7	23.333	11	14.865
Hawk, Sharp-shinned	7	23.333	10	13.514
Goshawk, Northern	7	23.333	9	12.162
Warbler, Wilson's	7	23.333	8	10.811
Grosbeak, Pine	7	23.333	8	10.811
Dove, Rock	6	20.000	10	13.514
Teal, Green-winged	6	20.000	7	9.459
Merganser, Red-breasted	6	20.000	6	8.108
Gull, Ring-billed	6	20.000	6	8.108
Vireo, Philadelphia	5	16.667	7	9.459
Cardinal, Northern	5	16.667	6	8.108
Harrier, Northern	5	16.667	6	8.108
Thrush, Grey-cheeked	4	13.333	7	9.459
Warbler, Palm	4	13.333	5	6.757
Sparrow, Field	4	13.333	5	6.757
Eagle, Bald	4	13.333	5	6.757
Hawk, Cooper's	3	10.000	4	5.405
Tern, Common	3	10.000	4	5.405
Grebe,Pied-billed	3	10.000	4	5.405
Swallow, N. Rough-winged	3	10.000	3	4.054
Crossbill, Red	3	10.000	3	4.054
Heron, Green-backed	3	10.000	3	4.054
Crossbill, White-winged	2	6.667	4	5.405
Woodpecker, Three-toed	2	6.667	2	2.703
Cuckoo, Yellow-billed	2	6.667	2	2.703
Owl, Northern Saw-whet	2	6.667	2	2.703
Hawk, Red-shouldered	2	6.667	2	2.703
Sparrow, Vesper	1	3.333	2	2.703
Teal, Blue-winged	1	3.333	2	2.703
Titmouse, Tufted	1	3.333	1	1.351
Shrike, Loggerhead	1	3.333	1	1.351
Finch, House	1	3.333	1	1.351
Lark, Horned	1	3.333	1	1.351
Cormorant, Double-crested	1	3.333	1	1.351
Gull, Great Black-backed	1	3.333	1	1.351

Table 3 (continued)

Region 4

	Minimum Coverage Blocks In Which Species Present #	%	All Blocks In Which Present #	%
Robin, American	50	100.000	97	83.621
Swallow, Tree	50	100.000	94	81.034
Chickadee, Black-capped	50	100.000	92	79.310
Yellowthroat, Common	50	100.000	92	79.310
Catbird, Grey	50	100.000	91	78.448
Swallow, Barn	50	100.000	91	78.448
Grackle, Common	50	100.000	91	78.448
Jay, Blue	50	100.000	90	77.586
Vireo, Red-eyed	50	100.000	89	76.724
Blackbird, Red-winged	50	100.000	89	76.724
Ovenbird	50	100.000	88	75.862
Waxwing, Cedar	50	100.000	88	75.862
Warbler, Black-White	50	100.000	86	74.138
Flicker, Common	50	100.000	86	74.138
Warbler, Yellow	50	100.000	83	71.552
Cowbird, Brown-headed	50	100.000	80	68.966
Sparrow, Song	49	98.000	92	79.310
Redstart, American	49	98.000	91	78.448
Veery	49	98.000	87	75.000
Warbler, Chestnut-sided	49	98.000	86	74.138
Sparrow, Chipping	49	98.000	85	73.276
Finch, Purple	49	98.000	85	73.276
Warbler, Yellow-rumped	49	98.000	81	69.828
Sparrow, White-throated	48	96.000	92	79.310
Crow, Common	48	96.000	86	74.138
Thrush, Wood	48	96.000	85	73.276
Goldfinch, American	48	96.000	85	73.276
Warbler, Nashville	48	96.000	81	69.828
Kingbird, Eastern	48	96.000	81	69.828
Woodpecker, Downy	48	96.000	69	59.483
Grosbeak, Rose-breast	47	94.000	82	70.690
Thrush, Hermit	47	94.000	70	60.345
Sapsucker, Yellow-bel	47	94.000	69	59.483
Grouse, Ruffed	47	94.000	56	48.276
Phoebe, Eastern	46	92.000	72	62.069
Tanager, Scarlet	46	92.000	69	59.483
Raven, Common	46	92.000	62	53.448
Woodpecker, Hairy	46	92.000	61	52.586
Flycatcher, Least	45	90.000	76	65.517
Parula, Northern	45	90.000	70	60.345
Swift, Chimney	45	90.000	69	59.483
Starling	44	88.000	75	64.655
Pewee, Eastern Wood	44	88.000	74	63.793
Warbler, Magnolia	44	88.000	66	56.897
Kingfisher, Belted	44	88.000	65	56.034
Hawk, Broad-winged	44	88.000	60	51.724
Oriole, Northern	43	86.000	72	62.069
Waterthrush, Northern	43	86.000	67	57.759
Dove, Mourning	43	86.000	67	57.759
Killdeer	43	86.000	65	56.034
Flycatcher, Grt Crest.	43	86.000	62	53.448
Kestrel, American	43	86.000	60	51.724

	Minimum Coverage Blocks In Which Species Present #	%	All Blocks In Which Present #	%
Woodpecker, Pileated	43	86.000	51	43.966
Nuthatch, Red-breast	42	84.000	66	56.897
Warbler, Canada	42	84.000	65	56.034
Hummingbird,Ruby-thr	42	84.000	54	46.552
Duck, Black	42	84.000	52	44.828
Bobolink	41	82.000	67	57.759
Vireo, Solitary	41	82.000	64	55.172
Wren, Winter	41	82.000	55	47.414
Duck, Wood	41	82.000	55	47.414
Woodcock, American	41	82.000	54	46.552
Grosbeak, Evening	40	80.000	61	52.586
Sparrow, House	40	80.000	59	50.862
Warbler, Black-thr.Green	40	80.000	57	49.138
Heron, Great Blue	40	80.000	57	49.138
Flycatcher, Alder	38	76.000	59	50.862
Warbler, Blackburnian	38	76.000	56	48.276
Swallow, Bank	38	76.000	55	47.414
Sparrow, Swamp	38	76.000	55	47.414
Vireo, Warbling	37	74.000	58	50.000
Sparrow, Savannah	37	74.000	55	47.414
Dove, Rock	37	74.000	51	43.966
Warbler, Black-throatedBl	37	74.000	50	43.103
Loon, Common	36	72.000	58	50.000
Swallow, Cliff	36	72.000	54	46.552
Sandpiper, Spotted	36	72.000	43	37.069
Junco, Dark-eyed	34	68.000	51	43.966
Flycatcher, Olive-sid.	34	68.000	42	36.207
Bittern, American	30	60.000	38	32.759
Thrasher, Brown	29	58.000	40	34.483
Cuckoo, Black-billed	29	58.000	36	31.034
Snipe, Common	29	58.000	36	31.034
Bunting, Indigo	28	56.000	41	35.345
Nuthatch, White-breasted	28	56.000	35	30.172
Creeper, Brown	28	56.000	32	27.586
Whip-poor-will	28	56.000	32	27.586
Meadowlark, Eastern	27	54.000	40	34.483
Owl, Barred	25	50.000	32	27.586
Sparrow, Field	24	48.000	32	27.586
Osprey	23	46.000	27	23.276
Mockingbird	23	46.000	26	22.414
Nighthawk, Common	22	44.000	32	27.586
Mallard	22	44.000	32	27.586
Bluebird, Eastern	22	44.000	26	22.414
Hawk, Red-tailed	22	44.000	25	21.552
Kinglet, Ruby-crowned	21	42.000	32	27.586
Towhee, Rufous-sided	21	42.000	32	27.586
Merganser, Hooded	21	42.000	30	25.862
Hawk, Marsh	21	42.000	25	21.552
Owl, Great-horned	21	42.000	24	20.690
Wren, House	20	40.000	33	23.448
Duck, Ring-necked	20	40.000	24	20.690
Mergnaser,Common	20	40.000	22	18.966

Table 3 (continued)

Region 4 (continued)

	Minimum Coverage Blocks In Which Species Present		All Blocks In Which Present	
	#	%	#	%
Kinglet, Golden-crowned	19	38.000	25	21.552
Warbler, Pine	18	36.000	25	21.552
Martin, Purple	18	36.000	20	17.241
Goshawk	18	36.000	18	15.517
Hawk, Sharp-shinned	18	36.000	18	15.517
Thrush, Swainson's	17	34.000	26	22.414
Warbler, Tennesee	17	34.000	26	22.414
Heron, Green	16	32.000	20	17.241
Teal, Blue-winged	16	32.000	17	14.655
Warbler, Bay-breasted	15	30.000	22	18.966
Goose, Canadian	15	30.000	20	17.241
Hawk, Red-shouldered	15	30.000	15	12.931
Warbler, Wilson's	14	28.000	17	14.655
Swallow, Rough-winged	14	28.000	15	12.931
Warbler, Cape May	13	26.000	20	17.241
Flycatcher, Yellowbellied	12	24.000	17	14.655
Siskin, Pine	12	24.000	16	13.793
Gull, Herring	12	24.000	15	12.931
Jay, Grey	12	24.000	14	12.069
Teal, Green-winged	12	24.000	14	12.069
Sparrow, Vesper	11	22.000	12	10.345
Rail, Virginia	11	22.000	12	10.345
Grebe,Pied-billed	11	22.000	12	10.345
Sparrow, Lincoln's	10	20.000	14	12.069
Cardinal	10	20.000	11	9.483
Cormorant, Dbl-crsted	10	20.000	11	9.483
Wren, Long-billed	10	20.000	10	8.621
Warbler, Palm	9	18.000	14	12.069
Warbler, Mourning	9	18.000	13	11.207
Finch, House	9	18.000	10	8.621
Chickadee, Boreal	9	18.000	9	7.759
Sora	9	18.000	9	7.759
Goldeneye, Common	8	16.000	11	9.483
Woodpecker, Blk-backed	8	16.000	10	8.621
Owl, Saw-whet	8	16.000	9	7.759
Eagle, Bald	7	14.000	10	8.621
Grouse, Spruce	7	14.000	9	7.759
Gull, Great Black-bkd	7	14.000	8	6.897
Vireo, Philadelphia	7	14.000	7	6.034
Cuckoo, Yellow-billed	7	14.000	7	6.034
Vulture, Turkey	6	12.000	8	6.897
Pheasant, Ring-necked	6	12.000	8	6.897
Waterthrush, Louisiana	4	8.000	9	7.759
Vireo, Yellow-throated	4	8.000	5	4.310
Blackbird, Rusty	4	8.000	5	4.310
Titmouse, Tufted	4	8.000	4	3.448
Warbler, Blackpoll	4	8.000	4	3.448
Crossbill, Red	4	8.000	4	3.448
Flycatcher, Willow	4	8.000	4	3.448
Gallinule, Common	4	8.000	4	3.448
Tern, Black	4	8.000	4	3.448
Sandpiper, Upland	3	6.000	5	4.310

Region 5

Table 3 (continued)

SPECIES	Minimum Coverage Blocks In Which Species Present #	%	All Blocks In Which Present #	%
Warbler, Yellow-rumped	16	100.000	28	62.222
Kingbird, Eastern	16	100.000	25	55.556
Sparrow, White-throated	15	100.000	28	62.222
Jay, Blue	15	100.000	28	62.222
Chickadee, Black-capped	15	100.000	27	60.000
Ovenbird	15	100.000	27	60.000
Vireo, Red-eyed	15	100.000	27	60.000
Raven, Common	15	100.000	26	57.778
Thrush, Hermit	15	100.000	25	55.556
Veery	15	100.000	25	55.556
Redstart, American	15	100.000	25	55.556
Parula, Northern	15	100.000	25	55.556
Warbler, Nashville	15	100.000	25	55.556
Warbler, Black-and-White	15	100.000	25	55.556
Swallow, Tree	15	100.000	25	55.556
Grosbeak, Rose-breasted	15	100.000	25	55.556
Grosbeak, Evening	15	100.000	25	55.556
Robin, American	15	100.000	24	53.333
Warbler, Blackburnian	15	100.000	24	53.333
Sapsucker, Yellow-bellied	15	100.000	24	53.333
Wren, Winter	15	100.000	23	51.111
Warbler, Magnolia	15	100.000	23	51.111
Finch, Purple	15	100.000	23	51.111
Grackle, Common	15	100.000	23	51.111
Warbler, Canada	15	100.000	22	48.889
Warbler, Chestnut-sided	15	100.000	22	48.889
Waxwing, Cedar	15	100.000	22	48.889
Sparrow, Song	15	100.000	22	48.889
Warbler, Black-thr.Green	15	100.000	21	46.667
Crow, American	15	100.000	21	46.667
Swift, Chimney	15	100.000	21	46.667
Hawk, Broad-winged	15	100.000	21	46.667
Goldfinch, American	15	100.000	20	44.444
Flycatcher, Alder	15	100.000	20	44.444
Flicker, Northern	15	100.000	20	44.444
Woodpecker, Hairy	15	100.000	20	44.444
Tanager, Scarlet	15	100.000	19	42.222
Woodpecker, Downy	15	100.000	18	40.000
Yellowthroat, Common	14	93.333	27	60.000
Vireo, Solitary	14	93.333	24	53.333
Swallow, Barn	14	93.333	23	51.111
Nuthatch, Red-breasted	14	93.333	22	48.889
Catbird, Grey	14	93.333	22	48.889
Thrush, Wood	14	93.333	21	46.667
Sparrow, Chipping	14	93.333	21	46.667
Cowbird, Brown-headed	14	93.333	20	44.444
Warbler, Tennessee	14	93.333	19	42.222
Pewee, Eastern Wood	14	93.333	19	42.222
Kestrel, American	14	93.333	19	42.222
Swallow, Cliff	14	93.333	18	40.000
Flycatcher, Least	14	93.333	18	40.000
Flycatcher, Great Crested	14	93.333	14	31.111

SPECIES	Minimum Coverage Blocks In Which Species Present #	%	All Blocks In Which Present #	%
Blackbird, Red-winged	13	86.667	21	46.667
Woodpecker, Pileated	13	86.667	21	46.667
Junco, Dark-eyed	13	86.667	20	44.444
Phoebe, Eastern	13	86.667	19	42.222
Kingfisher, Belted	13	86.667	19	42.222
Waterthrush, Northern	13	86.667	18	40.000
Warbler, Black-thr. Blue	13	86.667	18	40.000
Bobolink	13	86.667	18	40.000
Hummingbird, Ruby-throatd	13	86.667	18	40.000
Kinglet, Ruby-crowned	13	86.667	17	37.778
Sparrow, Savannah	13	86.667	17	37.778
Flycatcher, Yellowbellied	13	86.667	17	37.778
Cuckoo, Black-billed	13	86.667	16	35.556
Dove, Mourning	13	86.667	15	33.333
Thrush, Swainson's	12	80.000	19	42.222
Warbler, Yellow	12	80.000	19	42.222
Starling, European	12	80.000	19	42.222
Duck, American Black	12	80.000	19	42.222
Sparrow, Swamp	12	80.000	17	37.778
Warbler, Cape May	12	80.000	15	33.333
Flycatcher, Olive-sided	12	80.000	15	33.333
Kinglet, Golden-crowned	12	80.000	14	31.111
Loon, Common	11	73.333	28	62.222
Osprey	11	73.333	26	57.778
Nuthatch, White-breasted	11	73.333	16	35.556
Grouse, Ruffed	11	73.333	16	35.556
Heron, Great Blue	11	73.333	14	31.111
Siskin, Pine	11	73.333	13	28.889
Killdeer	10	66.667	16	35.556
Warbler, Bay-breasted	10	66.667	15	33.333
Chickadee, Boreal	10	66.667	14	31.111
Woodcock, American	10	66.667	14	31.111
Oriole, Northern	10	66.667	12	26.667
Warbler, Wilson's	10	66.667	11	24.444
Eagle, Bald	9	60.000	18	40.000
Nighthawk, Common	9	60.000	14	31.111
Jay, Grey	9	60.000	13	28.889
Sandpiper, Spotted	9	60.000	12	26.667
Meadowlark, Eastern	9	60.000	9	20.000
Swallow, Bank	8	53.333	11	24.444
Woodpecker, Black-backed	8	53.333	11	24.444
Snipe, Common	8	53.333	11	24.444
Bunting, Indigo	8	53.333	10	22.222
Owl, Barred	8	53.333	10	22.222
Sparrow, Lincoln's	8	53.333	9	20.000
Duck, Wood	7	46.667	14	31.111
Warbler, Pine	7	46.667	11	24.444
Creeper, Brown	7	46.667	10	22.222
Warbler, Mourning	7	46.667	9	20.000
Warbler, Palm	7	46.667	9	20.000
Vireo, Warbling	7	46.667	9	20.000
Thrasher, Brown	7	46.667	8	17.778

Table 3 (continued)

Region 5 (continued)

SPECIES	Minimum Coverage Blocks In Which Species Present #	%	All Blocks In Which Present #	%
Blackbird, Rusty	7	46.667	8	17.778
Martin, Purple	7	46.667	7	15.556
Hawk, Red-tailed	7	46.667	7	15.556
Hawk, Sharp-shinned	7	46.667	7	15.556
Bittern, American	6	40.000	10	22.222
Merganser, Hooded	6	40.000	8	17.778
Hawk, Red-shouldered	6	40.000	7	15.556
Harrier, Northern	6	40.000	7	15.556
Goshawk, Northern	6	40.000	6	13.333
Dove, Rock	6	40.000	6	13.333
Grouse, Spruce	5	33.333	8	17.778
Owl, Great-horned	5	33.333	7	15.556
Sparrow, House	5	33.333	6	13.333
Duck, Ring-necked	4	26.667	7	15.556
Merganser, Common	4	26.667	7	15.556
Bluebird, Eastern	4	26.667	5	11.111
Mallard	4	26.667	5	11.111
Sparrow, Vesper	4	26.667	4	8.889
Cuckoo, Yellow-billed	4	26.667	4	8.889
Whip-poor-will	3	20.000	5	11.111
Mockingbird	3	20.000	3	6.667
Swallow, N. Rough-winged	3	20.000	3	6.667
Crossbill, White-winged	3	20.000	3	6.667
Flycatcher, Willow	3	20.000	3	6.667
Heron, Green-backed	3	20.000	3	6.667
Gull, Herring	3	20.000	3	6.667
Goldeneye, Common	2	13.333	4	8.889
Teal, Blue-winged	2	13.333	4	8.889
Titmouse, Tufted	2	13.333	2	4.444
Wren, Marsh	2	13.333	2	4.444
Wren, House	2	13.333	2	4.444
Sparrow, Field	2	13.333	2	4.444
Owl, Northern Saw-whet	2	13.333	2	4.444
Pheasant, Ring-necked	2	13.333	2	4.444
Goose, Canada	2	13.333	2	4.444
Grebe, Pied-billed	2	13.333	2	4.444
Teal, Green-winged	1	6.667	3	6.667
Warbler, Blackpoll	1	6.667	2	4.444
Cardinal, Northern	1	6.667	2	4.444
Sora	1	6.667	2	4.444
Tern, Common	1	6.667	2	4.444
Vireo, Yellow-throated	1	6.667	1	2.222
Vireo, Philadelphia	1	6.667	1	2.222
Crossbill, Red	1	6.667	1	2.222
Grosbeak, Pine	1	6.667	1	2.222
Owl, Long-eared	1	6.667	1	2.222
Hawk, Cooper's	1	6.667	1	2.222
Sandpiper, Upland	1	6.667	1	2.222
Rail, Virginia	1	6.667	1	2.222
Cormorant, Dbl-crested	1	6.667	1	2.222
Tern, Black	1	6.667	1	2.222
Gull, Great Black-blacked	1	6.667	1	2.222

Region 6

Table 3 (continued)

SPECIES	Minimum Coverage Blocks In Which Species Present #	%	All Blocks In Which Present #	%
Crow, American	43	100.000	62	84.932
Robin, American	43	100.000	61	83.562
Catbird, Grey	43	100.000	61	83.562
Warbler, Black-thr.Green	43	100.000	61	83.562
Warbler, Yellow-rumped	43	100.000	61	83.562
Yellowthroat, Common	43	100.000	60	82.192
Parula, Northern	43	100.000	60	82.192
Warbler, Black-and-white	43	100.000	59	80.822
Raven, Common	43	100.000	59	80.822
Chickadee, Black-capped	43	100.000	58	79.452
Warbler, Nashville	43	100.000	58	79.452
Cowbird, Brown-headed	43	100.000	57	78.082
Flicker, Northern	43	100.000	57	78.082
Vireo, Red-eyed	43	100.000	56	76.712
Thrush, Hermit	43	100.000	54	73.973
Warbler, Canada	43	100.000	54	73.973
Ovenbird	43	100.000	54	73.973
Woodpecker, Downy	43	100.000	54	73.973
Sparrow, Song	42	97.674	61	83.562
Sparrow, White-throated	42	97.674	60	82.192
Goldfinch, American	42	97.674	60	82.192
Redstart, American	42	97.674	59	80.822
Swallow, Tree	42	97.674	59	80.822
Finch, Purple	42	97.674	58	79.452
Grackle, Common	42	97.674	58	79.452
Warbler, Magnolia	42	97.674	57	78.082
Waxwing, Cedar	42	97.674	57	78.082
Blackbird, Red-winged	42	97.674	57	78.082
Vireo, Solitary	42	97.674	56	76.712
Swallow, Barn	42	97.674	56	76.712
Starling, European	42	97.674	56	76.712
Warbler, Chestnut-sided	42	97.674	55	75.342
Warbler, Yellow	42	97.674	55	75.342
Sparrow, Chipping	42	97.674	52	71.233
Dove, Mourning	42	97.674	48	65.753
Jay, Blue	41	95.349	54	73.973
Kingbird, Eastern	41	95.349	54	73.973
Pewee, Eastern Wood	41	95.349	52	71.233
Veery	41	95.349	50	68.493
Wren, Winter	41	95.349	49	67.123
Warbler, Blackburnian	40	93.023	54	73.973
Junco, Dark-eyed	40	93.023	53	72.603
Kinglet, Ruby-crowned	40	93.023	52	71.233
Swallow, Cliff	40	93.023	52	71.233
Flycatcher, Least	40	93.023	48	65.753
Thrush, Swainson's	39	90.698	51	69.863
Grosbeak, Rose-breasted	39	90.698	51	69.863
Woodpecker, Hairy	39	90.698	49	67.123
Waterthrush, Northern	39	90.698	48	65.753
Swallow, Bank	39	90.698	47	64.384
Swift, Chimney	39	90.698	43	58.904
Osprey	38	88.372	60	82.192

SPECIES	Minimum Coverage Blocks In Which Species Present #	%	All Blocks In Which Present #	%
Flycatcher, Alder	38	88.372	49	67.123
Nuthatch, Red-breasted	38	88.372	47	64.384
Phoebe, Eastern	38	88.372	46	63.014
Grouse, Ruffed	38	88.372	45	61.644
Sparrow, Swamp	38	88.372	44	60.274
Hawk, Broad-winged	38	88.372	44	60.274
Killdeer	38	88.372	44	60.274
Kestrel, American	38	88.372	43	58.904
Grosbeak, Evening	38	88.372	42	57.534
Kingfisher, Belted	37	86.047	46	63.014
Bobolink	37	86.047	45	61.644
Warbler, Tennessee	37	86.047	44	60.274
Nighthawk, Common	37	86.047	41	56.164
Kinglet, Golden-crowned	36	83.721	45	61.644
Siskin, Pine	36	83.721	44	60.274
Duck, American Black	36	83.721	44	60.274
Warbler, Black-thr. Blue	36	83.721	42	57.534
Sapsucker, Yellow-bellied	36	83.721	41	56.164
Woodcock, American	36	83.721	41	56.164
Sparrow, Savannah	36	83.721	40	54.795
Thrush, Wood	35	81.395	47	64.384
Tanager, Scarlet	35	81.395	40	54.795
Flycatcher, Olive-sided	35	81.395	40	54.795
Hummingbird, Ruby-throatd	34	79.070	41	56.164
Chickadee, Boreal	34	79.070	40	54.795
Cuckoo, Black-billed	34	79.070	37	50.685
Hawk, Sharp-shinned	33	76.744	35	47.945
Sparrow, House	33	76.744	34	46.575
Warbler, Bay-breasted	32	74.419	38	52.055
Heron, Great Blue	31	72.093	43	58.904
Warbler, Cape May	31	72.093	37	50.685
Eagle, Bald	30	69.767	46	63.014
Sandpiper, Spotted	30	69.767	40	54.795
Flycatcher, Yellowbellied	30	69.767	38	52.055
Flycatcher, Great Crested	30	69.767	33	45.205
Sparrow, Lincoln's	29	67.442	33	45.205
Owl, Barred	29	67.442	31	42.466
Dove, Rock	29	67.442	30	41.096
Whip-poor-will	28	65.116	32	43.836
Warbler, Wilson's	28	65.116	31	42.466
Meadowlark, Eastern	28	65.116	31	42.466
Creeper, Brown	28	65.116	29	39.726
Warbler, Palm	27	62.791	29	39.726
Jay, Grey	27	62.791	29	39.726
Woodpecker, Pileated	27	62.791	29	39.726
Snipe, Common	26	60.465	29	39.726
Woodpecker, Black-backed	25	58.140	29	39.726
Thrasher, Brown	25	58.140	28	38.356
Goshawk, Northern	25	58.140	27	36.986
Sparrow, Vesper	25	58.140	25	34.247
Harrier, Northern	24	55.814	29	39.726
Grouse, Spruce	24	55.814	27	36.986

Table 3 (continued)

Region 6 (continued)

SPECIES	Minimum Coverage Blocks In Which Species Present #	%	All Blocks In Which Present #	%
Loon, Common	22	51.163	34	46.575
Crossbill, White-winged	22	51.163	26	35.616
Bittern, American	22	51.163	25	34.247
Bunting, Indigo	22	51.163	23	31.507
Owl, Great-horned	22	51.163	23	31.507
Oriole, Northern	20	46.512	26	35.616
Teal, Green-winged	20	46.512	22	30.137
Sparrow, Field	19	44.186	20	27.397
Heron, Green-backed	18	41.860	18	24.658
Cormorant, Dbl-crested	17	39.535	26	35.616
Tern, Common	17	39.535	24	32.877
Duck, Ring-necked	17	39.535	19	26.027
Nuthatch, White-breasted	17	39.535	18	24.658
Gull, Herring	16	37.209	27	36.986
Gull, Great Black-blacked	16	37.209	25	34.247
Mallard	16	37.209	19	26.027
Towhee, Rufous-sided	16	37.209	18	24.658
Eider, Common	15	34.884	25	34.247
Duck, Wood	15	34.884	19	26.027
Warbler, Blackpoll	15	34.884	17	23.288
Bluebird, Eastern	14	32.558	17	23.288
Warbler, Mourning	14	32.558	14	19.178
Guillemot, Black	13	30.233	20	27.397
Merganser, Hooded	13	30.233	15	20.548
Sparrow, Sharp-tailed	13	30.233	14	19.178
Mockingbird	13	30.233	13	17.808
Vireo, Warbling	11	25.581	14	19.178
Goose, Canada	11	25.581	13	17.808
Tern, Arctic	10	23.256	15	20.548
Crossbill, Red	10	23.256	10	13.699
Merganser, Common	10	23.256	10	13.699
Warbler, Pine	9	20.930	11	15.068
Rail, Virginia	9	20.930	10	13.699
Teal, Blue-winged	9	20.930	10	13.699
Swallow, N. Rough-winged	9	20.930	9	12.329
Hawk, Red-tailed	8	18.605	9	12.329
Owl, Northern Saw-whet	8	18.605	8	10.959
Sandpiper, Upland	8	18.605	8	10.959
Goldeneye, Common	8	18.605	8	10.959
Martin, Purple	7	16.279	8	10.959
Wren, House	7	16.279	7	9.589
Grebe,Pied-billed	7	16.279	7	9.589
Pheasant, Ring-necked	6	13.953	7	9.589
Cuckoo, Yellow-billed	6	13.953	6	8.219
Merganser, Red-breasted	5	11.628	7	9.589
Heron,Black-crowned Night	5	11.628	6	8.219
Cardinal, Northern	5	11.628	5	6.849
Hawk, Red-shouldered	4	9.302	5	6.849
Sora	4	9.302	4	5.479
Wren, Marsh	3	6.977	4	5.479
Tern, Roseate	3	6.977	4	5.479
Flycatcher, Willow	3	6.977	3	4.110
Owl, Long-eared	3	6.977	3	4.110
Hawk, Cooper's	3	6.977	3	4.110
Woodpecker, Three-toed	2	4.651	3	4.110
Cormorant, Great	2	4.651	3	4.110
Petrel, Leach's Storm-	2	4.651	3	4.110
Blackbird, Rusty	2	4.651	2	2.740
Lark, Horned	2	4.651	2	2.740
Gull, Laughing	2	4.651	2	2.740
Razorbill	2	4.651	2	2.740
Turkey, Wild	1	2.326	3	4.110
Shrike, Loggerhead	1	2.326	2	2.740
Bittern, Least	1	2.326	2	2.740
Finch, House	1	2.326	1	1.370
Willet	1	2.326	1	1.370
Moorhen, Common	1	2.326	1	1.370
Shoveler, Northern	1	2.326	1	1.370
Gadwall	1	2.326	1	1.370

Table 3 (continued)

Region 7

SPECIES	Minimum Coverage Blocks In Which Species Present #	%	All Blocks In Which Present #	%
Swallow, Tree	27	100.000	52	92.857
Robin, American	27	100.000	50	89.286
Swallow, Barn	27	100.000	50	89.286
Sparrow, Song	27	100.000	50	89.286
Chickadee, Black-capped	27	100.000	49	87.500
Catbird, Grey	27	100.000	49	87.500
Warbler, Yellow	27	100.000	49	87.500
Starling, European	27	100.000	49	87.500
Redstart, American	27	100.000	48	85.714
Yellowthroat, Common	27	100.000	47	83.929
Waxwing, Cedar	27	100.000	47	83.929
Goldfinch, American	27	100.000	47	83.929
Blackbird, Red-winged	27	100.000	47	83.929
Jay, Blue	27	100.000	47	83.929
Flicker, Northern	27	100.000	47	83.929
Sparrow, White-throated	27	100.000	46	82.143
Crow, American	27	100.000	46	82.143
Warbler, Black-thr.Green	27	100.000	45	80.357
Warbler, Black-and-White	27	100.000	45	80.357
Dove, Mourning	27	100.000	45	80.357
Cowbird, Brown-headed	27	100.000	43	76.786
Grackle, Common	26	96.296	48	85.714
Vireo, Red-eyed	26	96.296	46	82.143
Parula, Northern	26	96.296	45	80.357
Warbler, Chestnut-sided	26	96.296	44	78.571
Warbler, Yellow-rumped	26	96.296	44	78.571
Grosbeak, Rose-breasted	26	96.296	44	78.571
Woodpecker, Downy	26	96.296	42	75.000
Kingbird, Eastern	26	96.296	41	73.214
Thrush, Hermit	26	96.296	36	64.286
Woodpecker, Hairy	26	96.296	36	64.286
Veery	25	92.593	44	78.571
Bobolink	25	92.593	43	76.786
Swallow, Cliff	25	92.593	42	75.000
Killdeer	25	92.593	42	75.000
Warbler, Nashville	25	92.593	41	73.214
Sparrow, Chipping	25	92.593	41	73.214
Phoebe, Eastern	25	92.593	41	73.214
Sparrow, House	25	92.593	39	69.643
Oriole, Northern	25	92.593	39	69.643
Finch, Purple	25	92.593	38	67.857
Nuthatch, Red-breasted	25	92.593	33	58.929
Grouse, Ruffed	25	92.593	32	57.143
Hummingbird, Ruby-throatd	25	92.593	31	55.357
Ovenbird	24	88.889	44	78.571
Thrush, Wood	24	88.889	42	75.000
Warbler, Magnolia	24	88.889	36	64.286
Kingfisher, Belted	24	88.889	36	64.286
Pewee, Eastern Wood	23	85.185	41	73.214
Flycatcher, Great Crested	23	85.185	35	62.500
Swift, Chimney	23	85.185	35	62.500
Kestrel, American	23	85.185	33	58.929

SPECIES	Minimum Coverage Blocks In Which Species Present #	%	All Blocks In Which Present #	%
Sandpiper, Spotted	23	85.185	29	51.786
Flycatcher, Least	22	81.481	35	62.500
Towhee, Rufous-sided	22	81.481	34	60.714
Heron, Great Blue	22	81.481	33	58.929
Vireo, Solitary	21	77.778	34	60.714
Warbler, Canada	21	77.778	33	58.929
Nuthatch, White-breasted	21	77.778	30	53.571
Tanager, Scarlet	21	77.778	30	53.571
Meadowlark, Eastern	21	77.778	30	53.571
Hawk, Broad-winged	21	77.778	30	53.571
Sparrow, Swamp	21	77.778	28	50.000
Woodcock, American	21	77.778	27	48.214
Flycatcher, Alder	20	74.074	36	64.286
Swallow, Bank	20	74.074	29	51.786
Dove, Rock	19	70.370	28	50.000
Raven, Common	19	70.370	25	44.643
Sapsucker, Yellow-bellied	19	70.370	25	44.643
Warbler, Black-thr. Blue	19	70.370	23	41.071
Warbler, Blackburnian	19	70.370	22	39.286
Sparrow, Savannah	18	66.667	27	48.214
Duck, Wood	18	66.667	26	46.429
Waterthrush, Northern	18	66.667	25	44.643
Cuckoo, Black-billed	18	66.667	24	42.857
Wren, Winter	18	66.667	23	41.071
Duck, American Black	18	66.667	23	41.071
Mockingbird	18	66.667	22	39.286
Osprey	17	62.963	31	55.357
Thrasher, Brown	17	62.963	26	46.429
Owl, Great-horned	17	62.963	25	44.643
Flycatcher, Olive-sided	17	62.963	22	39.286
Creeper, Brown	17	62.963	21	37.500
Vireo, Warbling	16	59.259	25	44.643
Whip-poor-will	16	59.259	20	35.714
Mallard	16	59.259	20	35.714
Woodpecker, Pileated	16	59.259	16	28.571
Loon, Common	15	55.556	25	44.643
Merganser, Hooded	15	55.556	22	39.286
Bunting, Indigo	15	55.556	20	35.714
Wren, House	15	55.556	18	32.143
Warbler, Pine	14	51.852	19	33.929
Junco, Dark-eyed	13	48.148	20	35.714
Kinglet, Golden-crowned	13	48.148	19	33.929
Kinglet, Ruby-crowned	13	48.148	18	32.143
Sparrow, Field	12	44.444	17	30.357
Cardinal, Northern	12	44.444	16	28.571
Finch, House	12	44.444	15	26.786
Heron, Green-backed	12	44.444	15	26.786
Owl, Barred	12	44.444	14	25.000
Bittern, American	12	44.444	13	23.214
Snipe, Common	11	40.741	15	26.786
Wren, Marsh	11	40.741	12	21.429
Nighthawk, Common	10	37.037	14	25.000

Table 3 (continued)

Region 7 (continued)

SPECIES	Minimum Coverage Blocks In Which Species Present #	%	All Blocks In Which Present #	%
Eider, Common	9	33.333	19	33.929
Bluebird, Eastern	9	33.333	13	23.214
Harrier, Northern	9	33.333	11	19.643
Swallow, N. Rough-winged	9	33.333	10	17.857
Hawk, Red-shouldered	9	33.333	9	16.071
Cormorant, Dbl-crested	8	29.630	18	32.143
Gull, Herring	8	29.630	18	32.143
Goshawk, Northern	8	29.630	11	19.643
Grosbeak, Evening	8	29.630	10	17.857
Gull, Great Black-blacked	7	25.926	16	28.571
Duck, Ring-necked	7	25.926	11	19.643
Siskin, Pine	7	25.926	10	17.857
Pheasant, Ring-necked	7	25.926	8	14.286
Rail, Virginia	7	25.926	8	14.286
Martin, Purple	7	25.926	7	12.500
Cuckoo, Yellow-billed	7	25.926	7	12.500
Guillemot, Black	6	22.222	14	25.000
Thrush, Swainson's	6	22.222	12	21.429
Eagle, Bald	6	22.222	10	17.857
Hawk, Red-tailed	6	22.222	9	16.071
Teal, Blue-winged	6	22.222	9	16.071
Hawk, Sharp-shinned	6	22.222	8	14.286
Warbler, Wilson's	6	22.222	7	12.500
Goose, Canada	5	18.519	8	14.286
Vulture, Turkey	5	18.519	7	12.500
Sora	5	18.519	6	10.714
Heron,Black-crowned Night	5	18.519	6	10.714
Gull, Laughing	4	14.815	9	16.071
Sandpiper, Upland	4	14.815	7	12.500
Grebe,Pied-billed	4	14.815	6	10.714
Titmouse, Tufted	4	14.815	5	8.929
Sparrow, Vesper	4	14.815	5	8.929
Tern, Common	3	11.111	9	16.071
Vireo, Yellow-throated	3	11.111	5	8.929
Flycatcher, Yellowbellied	3	11.111	5	8.929
Bittern, Least	3	11.111	5	8.929
Owl, Northern Saw-whet	3	11.111	4	7.143
Warbler, Prairie	3	11.111	3	5.357
Sparrow, Sharp-tailed	3	11.111	3	5.357
Egret, Snowy	3	11.111	3	5.357
Turkey, Wild	2	7.407	7	12.500
Teal, Green-winged	2	7.407	6	10.714
Petrel, Leach's Storm-	2	7.407	5	8.929
Flycatcher, Willow	2	7.407	4	7.143
Warbler, Tennessee	2	7.407	3	5.357
Crossbill, White-winged	2	7.407	2	3.571
Coot, American	2	7.407	2	3.571
Goldeneye, Common	2	7.407	2	3.571
Tern, Black	2	7.407	2	3.571
Tern, Arctic	1	3.704	4	7.143
Hawk, Cooper's	1	3.704	3	5.357
Chickadee, Boreal	1	3.704	2	3.571
Warbler, Palm	1	3.704	2	3.571
Gnatcatcher, Blue-gray	1	3.704	1	1.786
Warbler, Mourning	1	3.704	1	1.786
Vireo, Philadelphia	1	3.704	1	1.786
Sparrow, Lincoln's	1	3.704	1	1.786
Gadwall	1	3.704	1	1.786
Merganser, Red-breasted	1	3.704	1	1.786
Tern, Least	1	3.704	1	1.786

Table 3 (continued)

Region 8

SPECIES	Minimum Coverage Blocks In Which Species Present #	%	All Blocks In Which Present #	%
Yellowthroat, Common	41	100.000	67	98.529
Swallow, Tree	41	100.000	65	95.588
Robin, American	41	100.000	64	94.118
Kingbird, Eastern	41	100.000	64	94.118
Swallow, Barn	41	100.000	63	92.647
Catbird, Grey	41	100.000	62	91.176
Towhee, Rufous-sided	41	100.000	62	91.176
Blackbird, Red-winged	41	100.000	62	91.176
Starling, European	41	100.000	62	91.176
Dove, Mourning	41	100.000	62	91.176
Chickadee, Black-capped	41	100.000	61	89.706
Warbler, Yellow	41	100.000	61	89.706
Cowbird, Brown-headed	41	100.000	61	89.706
Crow, American	41	100.000	61	89.706
Jay, Blue	41	100.000	61	89.706
Redstart, American	41	100.000	60	88.235
Waxwing, Cedar	41	100.000	60	88.235
Warbler, Chestnut-sided	41	100.000	59	86.765
Sparrow, Chipping	41	100.000	59	86.765
Goldfinch, American	41	100.000	59	86.765
Sparrow, House	41	100.000	58	85.294
Warbler, Black-and-white	41	100.000	58	85.294
Flicker, Northern	41	100.000	56	82.353
Killdeer	41	100.000	56	82.353
Swift, Chimney	41	100.000	55	80.882
Kestrel, American	41	100.000	51	75.000
Ovenbird	40	97.561	61	89.706
Vireo, Red-eyed	40	97.561	61	89.706
Phoebe, Eastern	40	97.561	61	89.706
Sparrow, Song	40	97.561	60	88.235
Oriole, Northern	40	97.561	57	83.824
Pewee, Eastern Wood	40	97.561	55	80.882
Finch, Purple	40	97.561	54	79.412
Woodpecker, Downy	40	97.561	54	79.412
Woodpecker, Hairy	40	97.561	53	77.941
Dove, Rock	40	97.561	51	75.000
Bobolink	39	95.122	57	83.824
Tanager, Scarlet	39	95.122	56	82.353
Sparrow, White-throated	39	95.122	56	82.353
Grackle, Common	39	95.122	56	82.353
Grosbeak, Rose-breasted	39	95.122	54	79.412
Flycatcher, Great Crested	39	95.122	52	76.471
Duck, American Black	39	95.122	50	73.529
Kingfisher, Belted	39	95.122	48	70.588
Warbler, Nashville	39	95.122	47	69.118
Thrush, Wood	38	92.683	56	82.353
Thrasher, Brown	38	92.683	54	79.412
Veery	38	92.683	53	77.941
Meadowlark, Eastern	38	92.683	50	73.529
Swallow, Bank	38	92.683	42	61.765
Wren, House	37	90.244	53	77.941
Mockingbird	37	90.244	49	72.059

SPECIES	Minimum Coverage Blocks In Which Species Present #	%	All Blocks In Which Present #	%
Warbler, Black-thr.Green	37	90.244	48	70.588
Warbler, Yellow-rumped	36	87.805	49	72.059
Sparrow, Swamp	36	87.805	44	64.706
Heron, Great Blue	36	87.805	44	64.706
Warbler, Canada	36	87.805	43	63.235
Hawk, Broad-winged	36	87.805	42	61.765
Cuckoo, Black-billed	36	87.805	39	57.353
Bunting, Indigo	35	85.366	46	67.647
Nuthatch, White-breasted	35	85.366	44	64.706
Flycatcher, Alder	35	85.366	43	63.235
Hummingbird, Ruby-throatd	35	85.366	40	58.824
Grouse, Ruffed	35	85.366	39	57.353
Swallow, Cliff	34	82.927	42	61.765
Nuthatch, Red-breasted	34	82.927	41	60.294
Vireo, Warbling	33	80.488	43	63.235
Sparrow, Savannah	33	80.488	40	58.824
Mallard	33	80.488	40	58.824
Warbler, Pine	33	80.488	39	57.353
Flycatcher, Least	32	78.049	43	63.235
Thrush, Hermit	31	75.610	41	60.294
Sandpiper, Spotted	31	75.610	36	52.941
Sparrow, Field	30	73.171	38	55.882
Vireo, Solitary	29	70.732	39	57.353
Finch, House	29	70.732	39	57.353
Waterthrush, Northern	29	70.732	36	52.941
Woodcock, American	29	70.732	35	51.471
Warbler, Magnolia	29	70.732	33	48.529
Woodpecker, Pileated	29	70.732	33	48.529
Owl, Great-horned	29	70.732	31	45.588
Cardinal, Northern	28	68.293	35	51.471
Whip-poor-will	28	68.293	34	50.000
Cuckoo, Yellow-billed	28	68.293	32	47.059
Heron, Green-backed	28	68.293	31	45.588
Duck, Wood	27	65.854	37	54.412
Creeper, Brown	27	65.854	30	44.118
Sapsucker, Yellow-bellied	27	65.854	29	42.647
Owl, Barred	26	63.415	29	42.647
Warbler, Blackburnian	26	63.415	28	41.176
Parula, Northern	25	60.976	30	44.118
Warbler, Black-thr. Blue	25	60.976	29	42.647
Bittern, American	24	58.537	27	39.706
Hawk, Red-shouldered	23	56.098	25	36.765
Bluebird, Eastern	22	53.659	29	42.647
Raven, Common	20	48.780	23	33.824
Flycatcher, Olive-sided	20	48.780	23	33.824
Osprey	20	48.780	21	30.882
Goshawk, Northern	18	43.902	23	33.824
Pheasant, Ring-necked	18	43.902	23	33.824
Nighthawk, Common	17	41.463	23	33.824
Rail, Virginia	17	41.463	21	30.882
Snipe, Common	17	41.463	19	27.941
Swallow, N. Rough-winged	17	41.463	17	25.000

Table 3 (continued)

Region 8 (continued)

SPECIES	Minimum Coverage Blocks In Which Species Present #	%	All Blocks In Which Present #	%
Sparrow, Vesper	16	39.024	19	27.941
Loon, Common	15	36.585	25	36.765
Wren, Winter	15	36.585	19	27.941
Vulture, Turkey	15	36.585	17	25.000
Gull, Herring	14	34.146	19	27.941
Hawk, Red-tailed	14	34.146	16	23.529
Wren, Marsh	14	34.146	14	20.588
Vireo, Yellow-throated	13	31.707	15	22.059
Flycatcher, Willow	13	31.707	14	20.588
Cormorant, Dbl-crested	12	29.268	19	27.941
Warbler, Prairie	12	29.268	17	25.000
Martin, Purple	12	29.268	16	23.529
Junco, Dark-eyed	12	29.268	15	22.059
Merganser, Hooded	12	29.268	15	22.059
Tern, Common	12	29.268	15	22.059
Goose, Canada	12	29.268	14	20.588
Hawk, Sharp-shinned	12	29.268	13	19.118
Titmouse, Tufted	12	29.268	12	17.647
Owl, Northern Saw-whet	12	29.268	12	17.647
Eider, Common	11	26.829	16	23.529
Heron,Black-crowned Night	10	24.390	17	25.000
Turkey, Wild	10	24.390	15	22.059
Sandpiper, Upland	10	24.390	13	19.118
Sparrow, Sharp-tailed	10	24.390	10	14.706
Siskin, Pine	10	24.390	10	14.706
Teal, Blue-winged	10	24.390	10	14.706
Gull, Great Black-blacked	9	21.951	14	20.588
Egret, Snowy	9	21.951	13	19.118
Harrier, Northern	9	21.951	10	14.706
Hawk, Cooper's	8	19.512	9	13.235
Grebe,Pied-billed	8	19.512	8	11.765
Kinglet, Golden-crowned	7	17.073	7	10.294
Sora	7	17.073	7	10.294
Lark, Horned	6	14.634	7	10.294
Teal, Green-winged	6	14.634	7	10.294
Guillemot, Black	5	12.195	9	13.235
Willet	5	12.195	6	8.824
Kinglet, Ruby-crowned	5	12.195	5	7.353
Eagle, Bald	5	12.195	5	7.353
Bittern, Least	5	12.195	5	7.353
Oriole, Orchard	4	9.756	6	8.824
Tern, Roseate	4	9.756	5	7.353
Gnatcatcher, Blue-gray	4	9.756	4	5.882
Plover, Piping	4	9.756	4	5.882
Merganser, Common	4	9.756	4	5.882
Tern, Least	4	9.756	4	5.882
Ibis, Glossy	3	7.317	5	7.353
Moorhen, Common	3	7.317	4	5.882
Gadwall	3	7.317	4	5.882
Thrush, Swainson's	3	7.317	3	4.412
Warbler, Mourning	3	7.317	3	4.412
Waterthrush, Louisiana	3	7.317	3	4.412
Crossbill, White-winged	3	7.317	3	4.412
Owl, Long-eared	3	7.317	3	4.412
Merganser, Red-breasted	3	7.317	3	4.412
Tern, Arctic	3	7.317	3	4.412
Warbler, Wilson's	2	4.878	3	4.412
Sparrow, Grasshopper	2	4.878	3	4.412
Duck, Ring-necked	2	4.878	3	4.412
Crossbill, Red	2	4.878	2	2.941
Heron, Little Blue	1	2.439	3	4.412
Heron, Tricolored	1	2.439	2	2.941
Warbler, Palm	1	2.439	1	1.471
Warbler, Bay-breasted	1	2.439	1	1.471
Warbler, Blue-winged	1	2.439	1	1.471
Flycatcher, Yellowbellied	1	2.439	1	1.471
Coot, American	1	2.439	1	1.471
Egret, Cattle	1	2.439	1	1.471

Table 4. Ranking of Regions, by Species

The numbers on each line below are the numbered regions or "wildlife management units" depicted in Figure 2.

In Part A below, the first number on each line indicates the region in which the species was most widespread, while the last number indicates the region where its occurrence was most restricted. Intervening numbered regions are in rank order, from most to least widespread distribution. In regions enclosed by parentheses, the species was about equally widespread. The basis for the rankings is the data summarized in Table 3.

In Part B, the regions have been similarly rated with regard to selected environmental factors. The ranking is from the region having the largest or highest amount of the factor, to the region having the least. Thus, hypotheses may be generated regarding a species' environmental needs by comparing its ranked order of regions in Part A with the sequence of regional rankings in Part B. Where the sequence is generally similar, a correlation and possibly a causal relationship may exist. For example, the regional ranking of Northern Mockingbird parallels that of human population density, and that of Swainson's Thrush generally follows that of spruce-fir forest. Data used in Part B ratings are courtesy of the Maine Department of Inland Fisheries and Wildlife.

Part A. Ranking by Species

LOON, Common
2, 3, 5, 4, 1, 7, 6, 8

GREBE, Pied-billed
1, 4, 8, (6, 7), 5, 3, 2

STORM-PETREL, Leach's
7, 6

CORMORANT, Great
6

Double-crested
6, 7, 8

BITTERN, American
(2, 4), (1, 8), 3, 6, 7, 5

Least
8, 7, 4, 6

HERON, Great Blue
8, (3, 4, 7), 2, (1, 5), 6

EGRET, Snowy
8, 7, 6

HERON, Little Blue
8

Tricolored
8

EGRET, Cattle
8

HERON, Green-backed
8, 7, 6, 4, 5, (1, 3), 2

NIGHT-HERON, Black-crowned
8, 1, 7, 6, 2, 4

IBIS, Glossy
8

GOOSE, Canada
8, (4, 6), (3, 7), 1, 2, 5

DUCK, Wood
4, (7, 8), (1, 3), 5, 2, 6

TEAL, Green-winged
(1, 6), 4, (2, 3), 8, (5, 7)

DUCK, American Black
8, 1, 4, 6, (2, 5), 3, 7

MALLARD
8, 7, (1, 4), 3, 6, 5, 2

TEAL, Blue-winged
1, 4, 8, 7, 6, (2, 5), 3

SHOVELER, Northern
1

GADWALL
8, (4, 6, 7)

WIGEON, American
(1, 4)

Table 4 (continued)

DUCK, Ring-necked
(1, 2), (3, 4, 6), (5, 7), 8
EIDER, Common
(6, 7), 8
GOLDENEYE, Common
2, 1, 3, (4, 6), 5, (7, 8)
MERGANSER, Hooded
7, 1, 4, 5, 3, 2, (6, 8)
Common
2, 3, 1, 4, 5, 6, 8
Red-breasted
3, 2, 6, 8, 1, 7, 4
VULTURE, Turkey
8, 7, 4
OSPREY
6, 5, 7, 2, 1, 8, 3, 4
EAGLE, Bald
6, 5, 2, 7, (3, 4, 8), 1
HARRIER, Northern
1, 6, 4, 5, 7, 8, 2, 3
HAWK, Sharp-shinned
6, 1, 2, 5, 4, 8, (3, 7)
Cooper's
8, 2, 3, (5, 6), 1, 7, 4
GOSHAWK, Northern
6, 8, 5, 4, 2, 7, 1, 3
HAWK, Red-shouldered
8, 5, 7, 4, (1, 2, 6), 3
Broad-winged
5, 2, (4, 6, 8), 7, 3, 1
Red-tailed
2, 3, (4, 5), 1, 8, 7, 6
KESTREL, American
8, 5, (1, 4, 6), 7, 3, 2
PHEASANT, Ring-necked
8, 7, (4, 5, 6)
GROUSE, Spruce
(2, 3), 6, 5, 1, 4
Ruffed
2, 4, (3, 7), 6, (1, 8), 5
TURKEY, Wild
8, 7, 4, 6
RAIL, Virginia
8, 7, 4, 6, 2, 5
SORA
(4, 7, 8), (1, 6), 5
MOORHEN, Common
4, 8, 6
COOT, American
(4, 7, 8)
PLOVER, Piping
8

KILLDEER
(1, 8), 7, (4, 6), 5, 3, 2
WILLET
8, 6
SANDPIPER, Spotted
2, 1, 7, 8, 4, 6, 5, 3
Upland
8, 6, 7, 1, (4, 5)
SNIPE, Common
1, (3, 4, 6), (2, 5), (7, 8)
WOODCOCK, American
(4, 6), 7, 2, (3, 8), 1, 5
GULL, Laughing
7, 6, 8
Bonaparte's
2
Ring-billed
3, 2, 1, (4, 6)
Herring
6, 8, 7, 2, 3, 5, 4, 1
Great Black-backed
6, 7, 8, (2, 3, 4, 5)
TERN, Roseate
8, 6
Common
6, 8, 7, 2, 1, 3, 5, 4
Arctic
6, 7, 8
Least
8, 7
Black
4, 7, 5
RAZORBILL
6
GUILLEMOT, Black
6, 7, 8
PUFFIN, Atlantic
7
DOVE, Rock
8, 4, 7, (1, 6), 5, 3, 2
Mourning
(7, 8), 6, (1, 4, 5), 3, 2
CUCKOO, Black-billed
(5, 8), 6, 7, (1, 4), 3, 2
Yellow-billed
8, (5, 7), (1, 4, 6), 3, 2
OWL, Great Horned
7, 8, 6, (1, 3), 4, 5, 2
Barred
6, 8, (1, 4, 5), 3, 7, 2
Long-eared
(5, 6, 8)

Table 4 (continued)

OWL, Northern Saw-whet
8, 1, 6, (2, 4), 5, 7, 3
NIGHTHAWK, Common
6, 5, 1, 2, 4, 8, 7, 3
WHIP-POOR-WILL
8, 6, (4, 7), 3, 1, 5, 2
SWIFT, Chimney
(5, 8), (4, 6), 2, 7, 1, 3
HUMMINGBIRD, Ruby-throated
7, (1, 3), (4, 5, 8), 2, 6
KINGFISHER, Belted
1, 8, 3, 2, (4, 7), (5, 6)
SAPSUCKER, Yellow-bellied
(2, 5), (1, 4), 3, 6, 7, 8
WOODPECKER, Downy
(1, 5, 6), 8, (4, 7), 3, 2
Hairy
(1, 5), 8, (3, 7), (2, 4), 6
Three-toed
2, 3, 1
Black-backed
2, 3, (1, 6), 5, 4
FLICKER, Northern
(1, 3, 4, 5, 6, 7, 8), 2
WOODPECKER, Pileated
2, (4, 5), 3, 8, (1, 6, 7)
FLYCATCHER, Olive-sided
2, 6, 5, 4, (1, 7), 3, 8
WOOD-PEWEE, Eastern
8, (1, 6), (3, 5), 4, 7, 2
FLYCATCHER, Yellow-bellied
5, (2, 3, 6), 1, 4, 7, 8
Alder
5, 1, 6, 8, 4, 3, 7, 2
Willow
8, 5, 4, (6, 7), 1
Least
1, (3, 5, 6), (2, 4), 7, 8
PHOEBE, Eastern
8, 4, 7, 6, 5, 1, 3, 2
FLYCATCHER, Great Crested
8, 5, 4, 7, 6, (1, 3), 2
KINGBIRD, Eastern
(1, 5, 8), 4, (6, 7), 2, 3
LARK, Horned
1, 8, 6, (3, 4)
MARTIN, Purple
5, 4, 8, 7, 6, 1
SWALLOW, Tree
(2, 3, 4, 5, 6, 7, 8), 1
Northern Rough-winged
8, 7, 4, (5, 6), (1, 3), 2
SWALLOW, Bank
8, 6, 1, 4, 7, 3, 5, 2
Cliff
(5, 6, 7), 8, 4, 1, (2, 3)
Barn
(1, 2, 3, 4, 6, 7, 8), 5
JAY, Gray
2, 6, 5, 1, 3, 4
Blue
(1, 2, 3, 4, 5, 6, 7, 8)
CROW, American
(1, 5, 6, 7, 8), 3, 2, 4
RAVEN, Common
(1, 2, 3, 5, 6), 4, 7, 8
CHICKADEE, Black-capped
(1, 2, 3, 4, 5, 6, 7, 8)
Boreal
2, 6, 3, 5, 1, 4, 7
TITMOUSE, Tufted
8, (5, 7), 4, 6
NUTHATCH, Red-breasted
(2, 3), (5, 7), 6, (4, 8), 1
White-breasted
8, 7, 5, 4, 3, 6, 1, 2
CREEPER, Brown
3, 2, (6, 8), 7, (1, 4), 5
WREN, House
8, 7, 4, 3, 6, 5, (1, 2)
Winter
5, 6, 2, (1, 3), 4, 7, 8
Marsh
7, 8, 4, 5, 6, 2
KINGLET, Golden-crowned
(1, 6), 5, 2, 3, 7, 4, 8
Ruby-crowned
2, 6, 1, 5, 3, 7, 4, 8
GNATCATCHER, Blue-gray
8, (4, 7)
BLUEBIRD, Eastern
8, 4, 3, (6, 7), 5, 2, 1
VEERY
(1, 3, 4, 5), 6, (2, 7, 8)
THRUSH, Gray-cheeked
3, 2
Swainson's
2, 6, 3, 5, 1, 4, 7, 8
Hermit
(5, 6), 7, (3, 4), 1, 2, 8
Wood
4, (5, 8), (1, 7), 6, 3, 2
ROBIN, American
(1, 2, 3, 4, 5, 6, 7, 8)

Table 4 (continued)

CATBIRD, Gray
(1, 3, 4, 6, 7, 8), 5, 2
MOCKINGBIRD, Northern
8, 7, 4, 1, 6, 3, 5, 2
THRASHER, Brown
8, (4, 7), 6, 5, 3, 1, 2
PIPIT, Water
2
WAXWING, Cedar
(1, 2, 3, 4, 5, 6, 7, 8)
SHRIKE, Loggerhead
6
STARLING, European
(7, 8), 6, 1, 4, 5, 3, 2
VIREO, Solitary
6, (1, 5), (2, 3), 4, 7, 8
Yellow-throated
8, 7, 4, 5
Warbling
8, 4, 1, 7, 5, 3, 6, 2
Philadelphia
2, (1, 3, 4), 5, 7, 8
Red-eyed
(4, 5, 6, 8), 7, 1, 2, 3
WARBLER, Blue-winged
8
Tennessee
5, 2, 6, 1, 3, 4, 7
Nashville
(5, 6), (1, 2, 3, 4, 7, 8)
PARULA, Northern
(1, 5, 6), (2, 7), 3, 4, 8
WARBLER, Yellow
(4, 7, 8), 6, 1, 5, 3, 2
Chestnut-sided
(1, 5, 8), (4, 6), (3, 7), 2
Magnolia
(2, 5), (3, 6), (1, 4, 7), 8
Cape May
(1, 2), 5, 6, 3, 4
Black-throated Blue
2, 3, 5, 6, 4, 7, 1, 8
Yellow-rumped
(2, 5, 6), (3, 4, 7), 1, 8
Black-throated Green
(5, 6, 7), (1, 2, 3, 8), 4
Blackburnian
5, 2, 6, (1, 3), 4, 7, 8
Pine
8, 7, 5, 4, 3, 6, 1, 2
Prairie
8, 7

WARBLER, Palm
6, 5, 2, 4, 1, 3, (7, 8)
Bay-breasted
2, 3, 6, 1, 5, 4, 8
Blackpoll
2, 1, 6, 3, 4, 5
Black-and-white
(1, 4, 5, 6, 7, 8), 3, 2
REDSTART, American
(1, 2, 5, 7, 8), (3, 4, 6)
OVENBIRD
(4, 5, 6), (2, 8), 3, 1, 7
WATERTHRUSH, Northern
1, 2, 6, (4, 5), 3, 8, 7
Louisiana
4, 8
WARBLER, Mourning
2, (1, 5), 3, 6, 4, 8, 7
YELLOWTHROAT, Common
(1, 2, 3, 4, 6, 7, 8), 5
WARBLER, Wilson's
(5, 6), 2, (1, 4), (3, 7), 8
Canada
(2, 5, 6), 3, 8, 1, 4, 7
TANAGER, Scarlet
5, 8, 4, 2, 6, (1, 7), 3
CARDINAL, Northern
8, 7, 4, 3, 6, 5
GROSBEAK, Rose-breasted
(1, 2, 3, 5), (7, 8), 4, 6
BUNTING, Indigo
8, 4, 7, 5, 6, 3, 1, 2
TOWHEE, Rufous-sided
8, 7, 4, 6, 3, 2
SPARROW, Chipping
(1, 4, 8), (2, 3, 6), 5, 7
Field
8, 4, (6, 7), (3, 5)
Vesper
6, (1, 8), 5, 4, 7, 3
Savannah
1, 5, 6, 8, 4, 7, 3, 2
Grasshopper
8
Sharp-tailed
6, 7, 8, 4
Fox
2
Song
(1, 2, 3, 4, 5, 6, 7, 8)
Lincoln's
6, 2, 5, (1, 3), 4, 7

Table 4 (continued)

SPARROW, Swamp
6, 8, (3, 5), 7, (2, 4), 1
White-throated
(1, 2, 3, 5, 7), 6, (4, 8)
JUNCO, Dark-eyed
(2, 3), (1, 6), 5, 4, 7, 8
BOBOLINK
(1, 8), 7, (4, 5, 6), 3, 2
BLACKBIRD, Red-winged
(1, 3, 4, 7, 8), 6, 2, 5
MEADOWLARK, Eastern
8, 7, 6, 4, 5, 3, 1, 2
BLACKBIRD, Rusty
(2, 5), 3, 1, 4, 6
GRACKLE, Common
(1, 2, 4, 5), (3, 6, 7, 8)
COWBIRD, Brown-headed
(1, 4, 6, 7, 8), 5, 3, 2
ORIOLE, Orchard
8
ORIOLE, Northern
8, 7, 4, 1, 5, 3, 6, 2
GROSBEAK, Pine
2, 3, 1, 5
FINCH, Purple
(1, 2, 3, 5), (4, 6, 8), 7
House
8, 7, 4, 3, 6
CROSSBILL, Red
6, 2, 3, 4, 5, 8
White-winged
6, 5, 2, 1, (3, 7, 8)
SISKIN, Pine
(2, 6), 3, 5, 1, (4, 7, 8)
GOLDFINCH, American
(1, 5, 7, 8), 6, 4, 3, 2
GROSBEAK, Evening
(1, 2, 5), 3, 6, 4, 7
SPARROW, House
8, 7, 4, 6, 1, 5, 3, 2

Part B. Environmental Factors

SOFTWOOD Acreage
8, 2, (4, 7), (3, 5), 6
Spruce-Fir
2, (3, 5, 6), 1, (4, 7), 8
Pine-Hemlock
8, (4, 7), 5, 6, (2, 3), 1

HARDWOOD Acreage
Northern (Type)
3, 4, 2, (5, 6, 7), (1, 8)
Oak-Central
8, 7, 6, 4, 5, (1, 2, 3)
Aspen-Birch
(1, 6), (3, 4), (2, 5, 7, 8)

FOREST CUT in Last 10 Years
4, 8, (1, 7), 3, (5, 6), 2

AGRICULTURAL Land
Idle
1, 8, 7, 4, 3
Active
1, 8, 4, 6, 7, 5
DEVELOPED Land
8, 7, (4, 6), (1, 5), (2, 3)
POPULATION DENSITY
8, 7, 4, (1, 6), 5, 3, 2
10-YEAR % POPULATION INCREASE
2, 3, 6, 5, (7, 8), 4, 1

LAKE Acreage
2, 3, 5, 4, 8, 6, 7, 1
WETLAND DENSITY
5, 8, 6, 7, 3, 4, 2, 1
WETLAND ACREAGE
All Fresh Types
2, 4, 3, 5, 8, 6, 7, 1
Shallow
4, 7, 6, 8, 2, 5, 1, 3
Deep
4, 8, (2, 7), (3, 6), 5, 1
Shrub
4, 3, (2, 7), (1, 8), 6, 5
Wooded
4, 1, 2, 7, 5, 3, 8, 6
Salt Marsh/Meadow
6, 8, 7
"High Waterfowl Value"
8, 6, 4, 7, 1, (3, 5), 2
RIVERINE DENSITY
3, 4, 1, (6, 8), 5, (2, 7)
RIVERINE MILES
2, 4, 3, 1, 8, 5, 6, 7
MEAN SUMMER TEMPERATURE
8, 7, 4, 5, (1, 6), 2, 3
MEAN SPRING PRECIPITATION
6, (7, 8), (4, 5), (1, 2, 3)
MEAN SUMMER PRECIPITATION
(1, 2), 3, 4, 5, (7, 8), 6

Figure 1. Map Showing Blocks with Minimum and Adequate Coverage

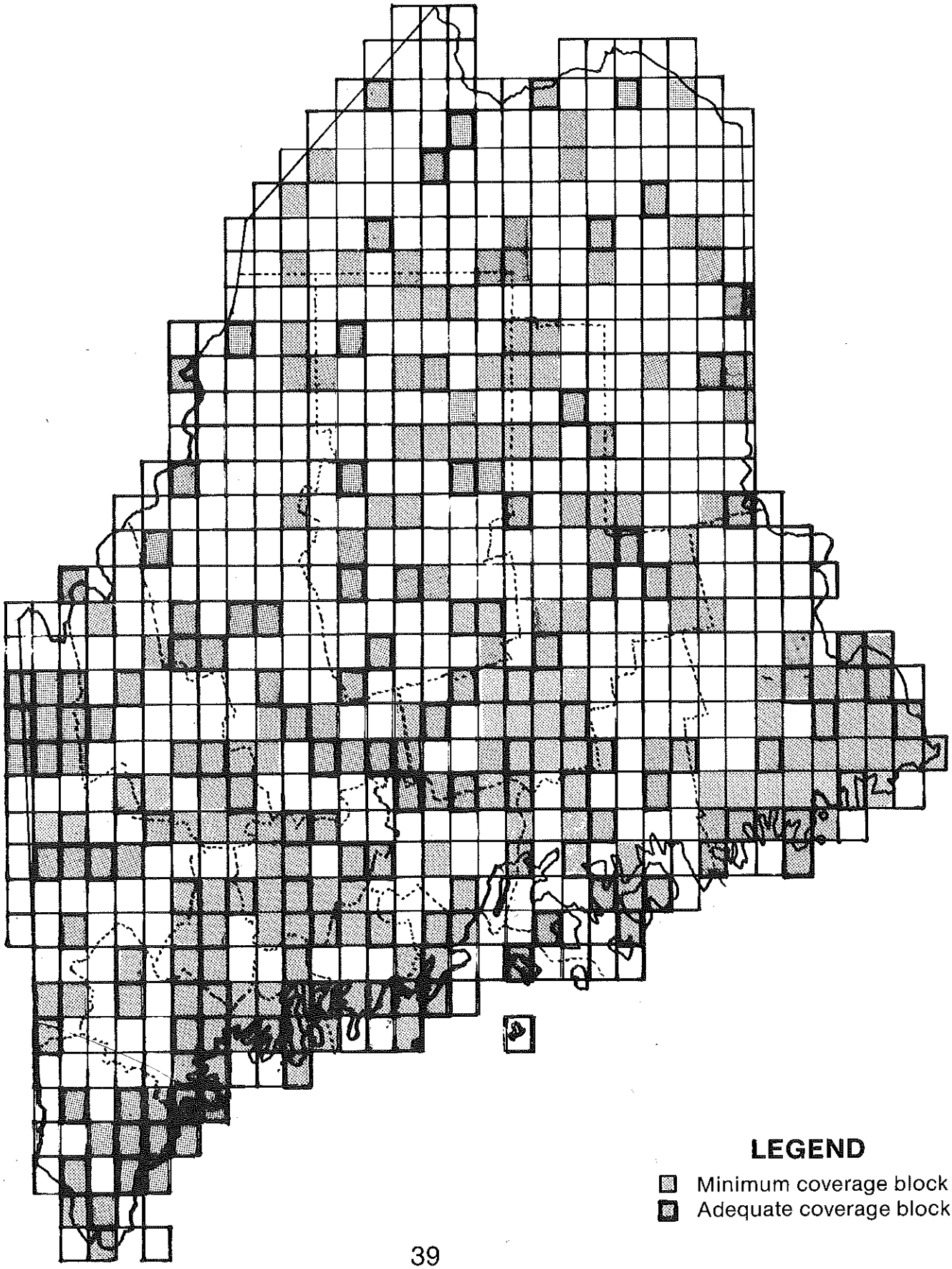


Figure 2. Location of Wildlife Management Units (WMU's)

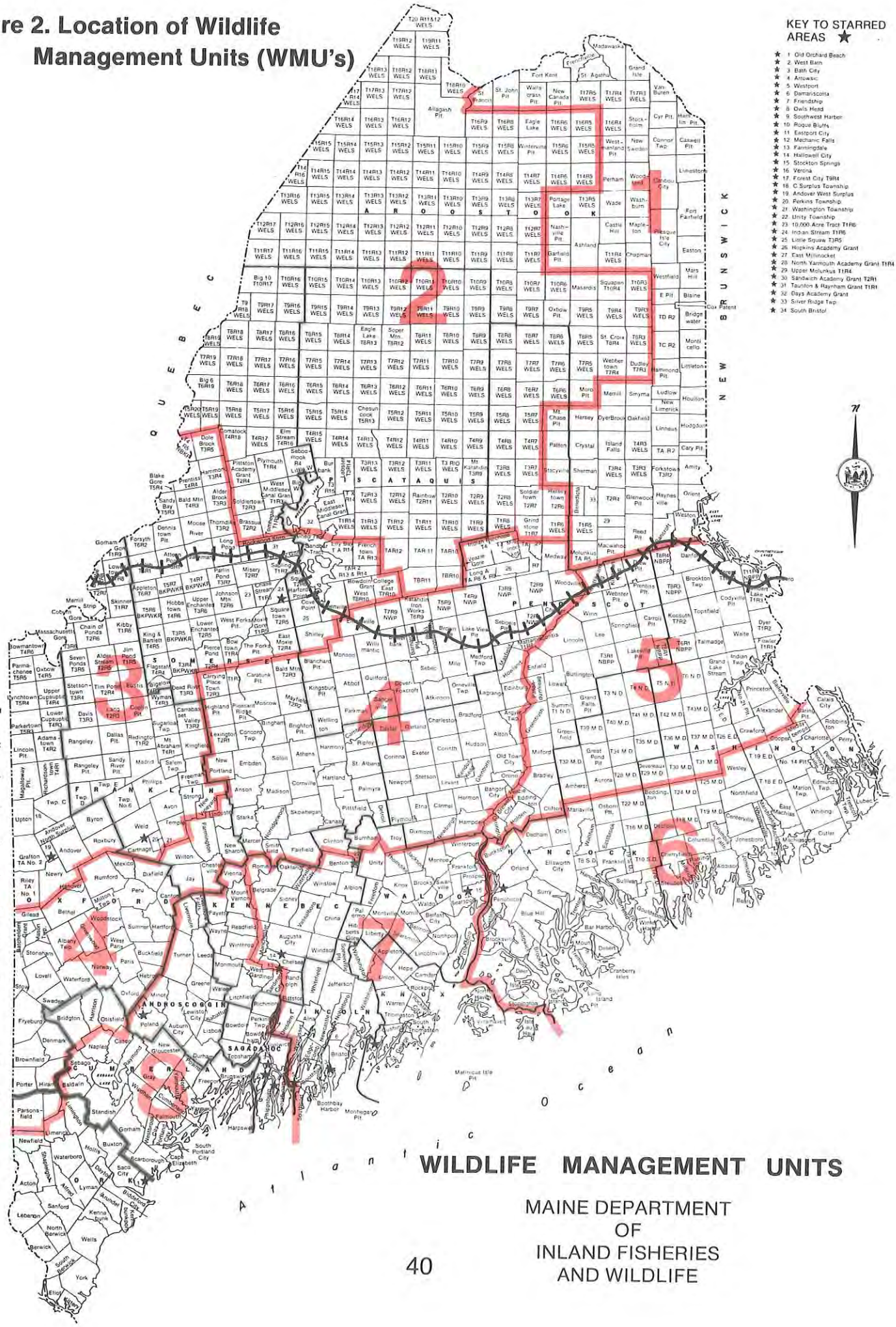
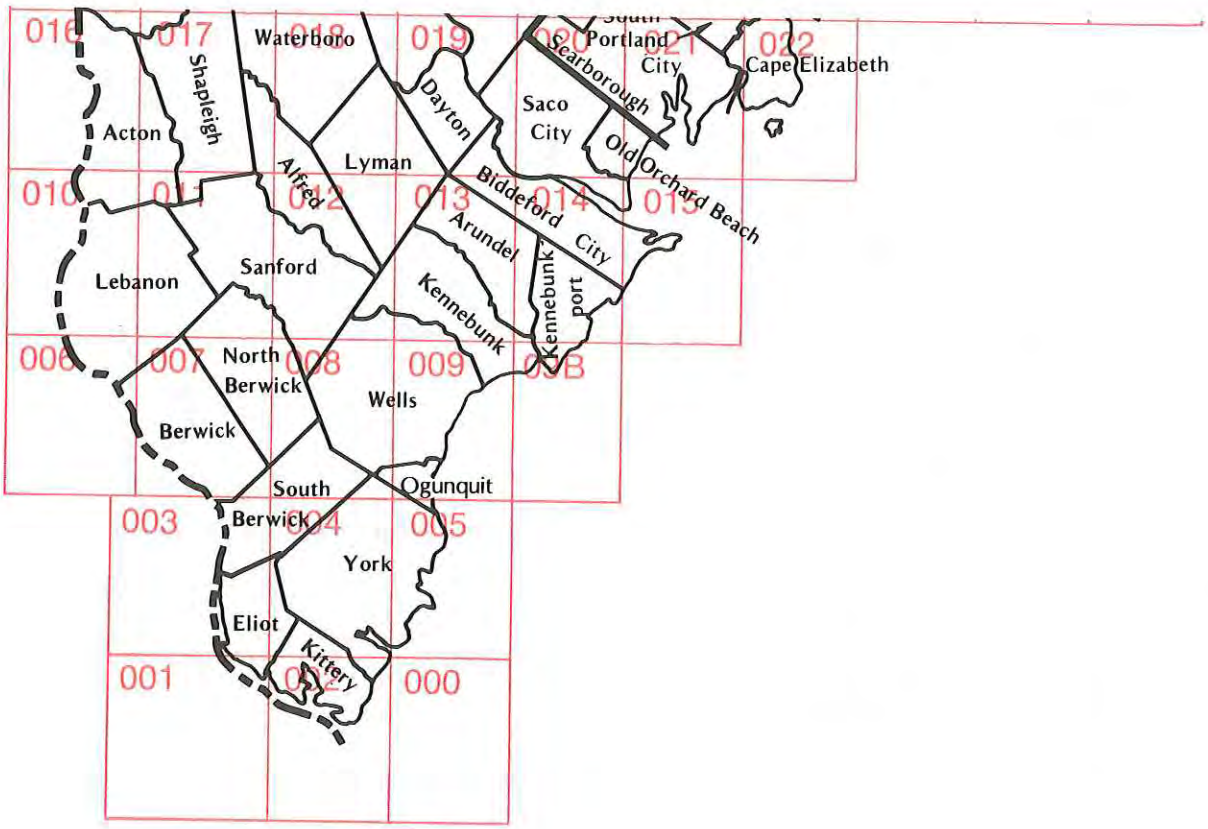
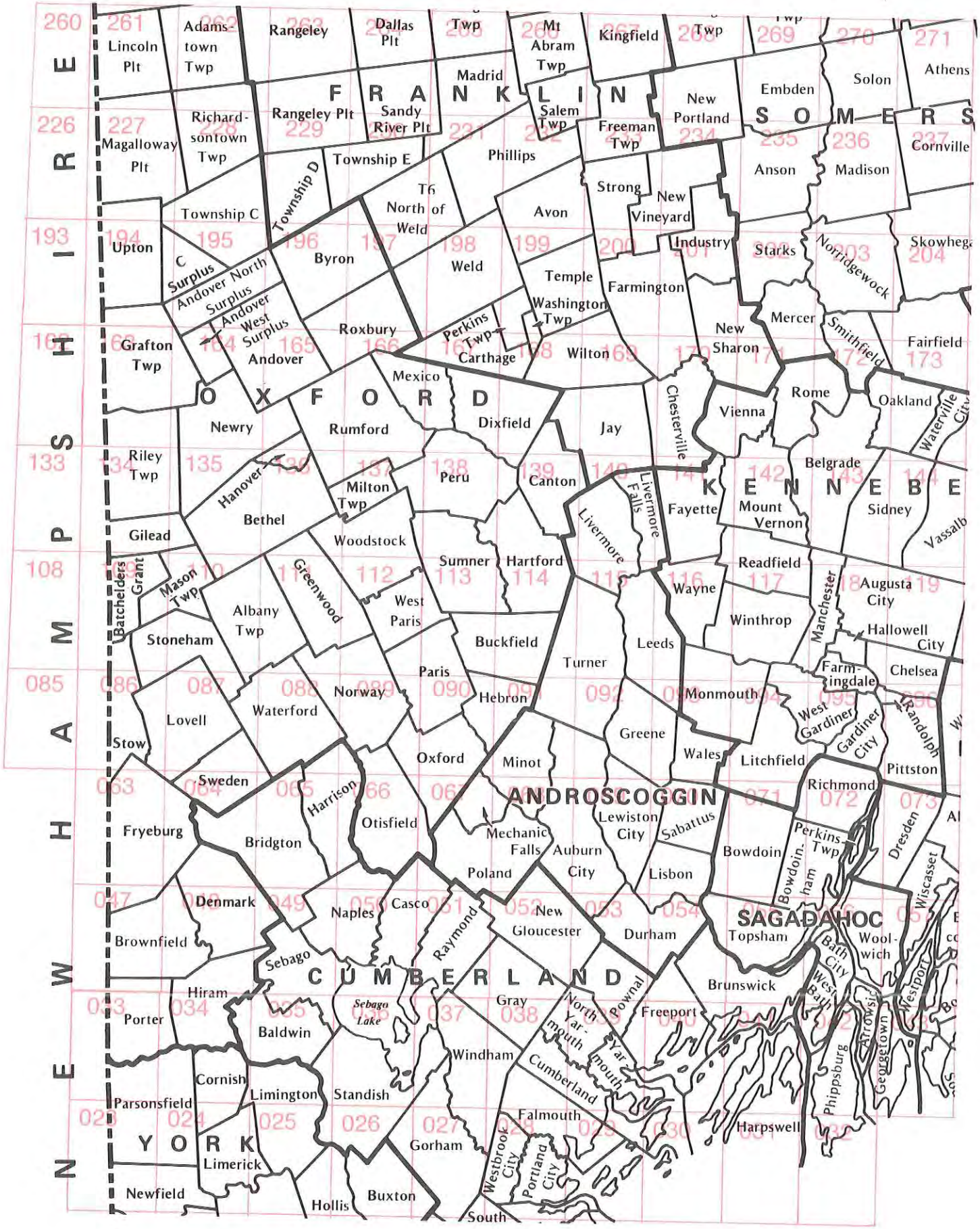


Figure 3. Index Map with Political Features



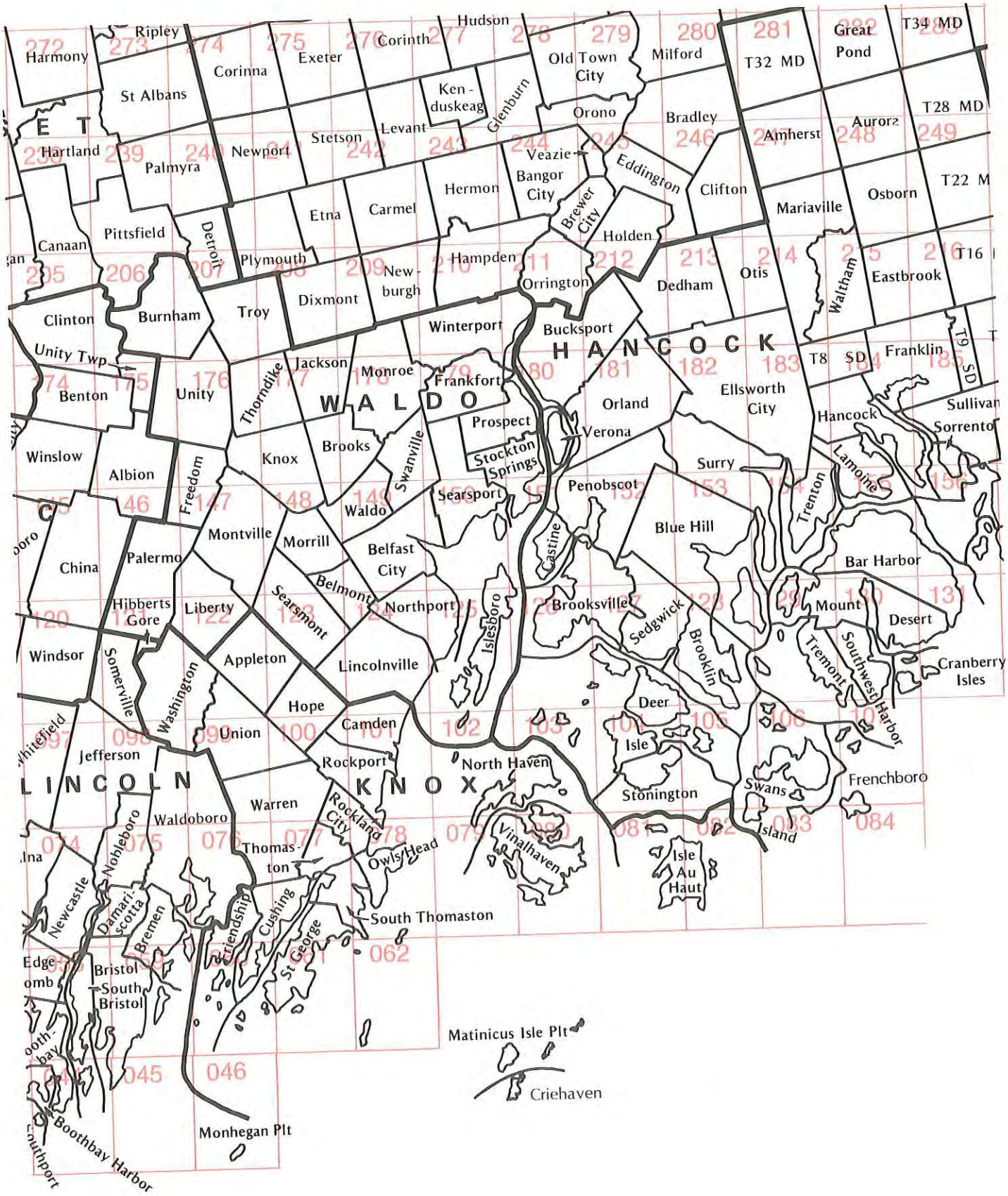
York County Area Blocks

Figure 3. (continued)



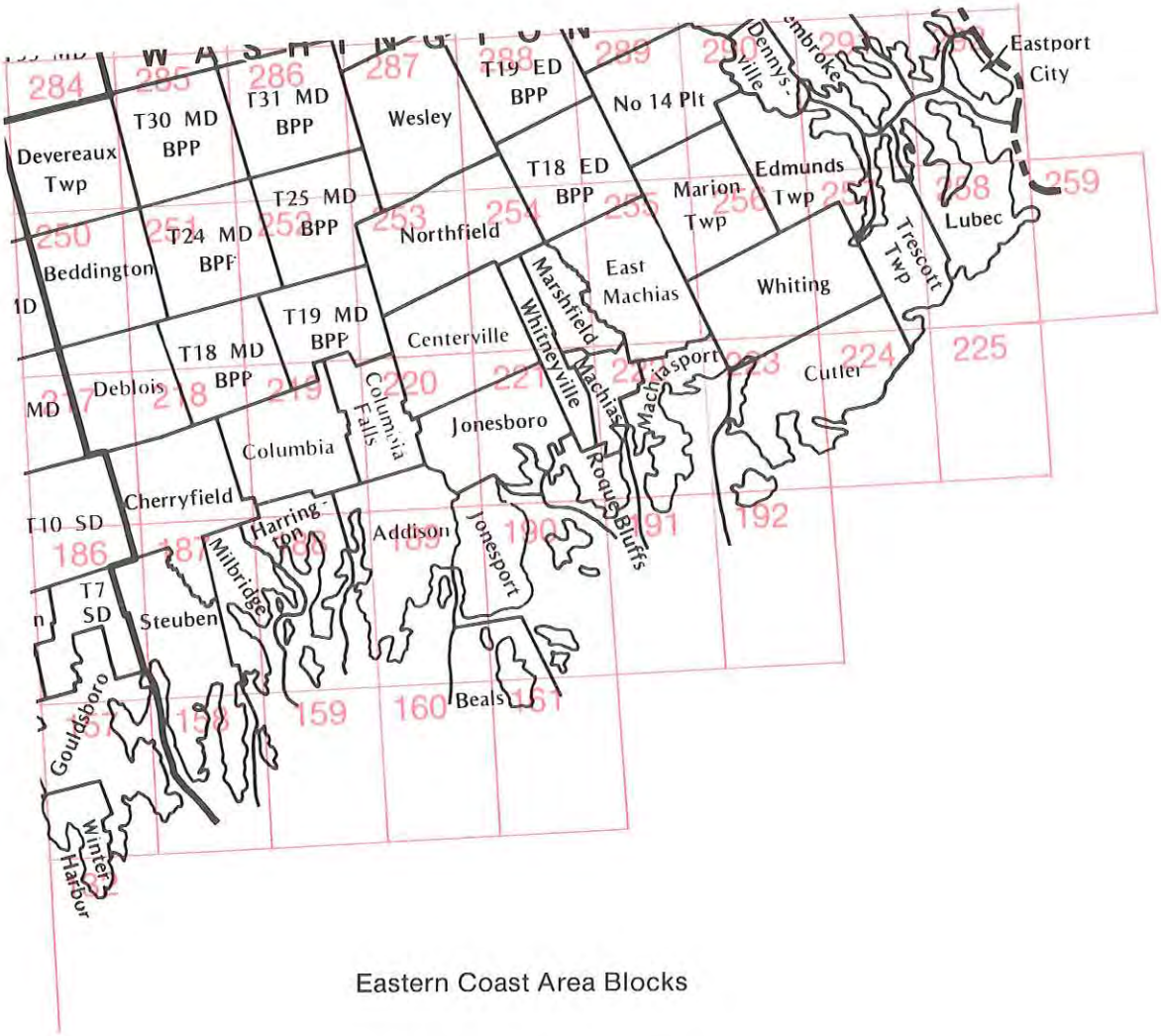
West-central Area Blocks

Figure 3. (continued)



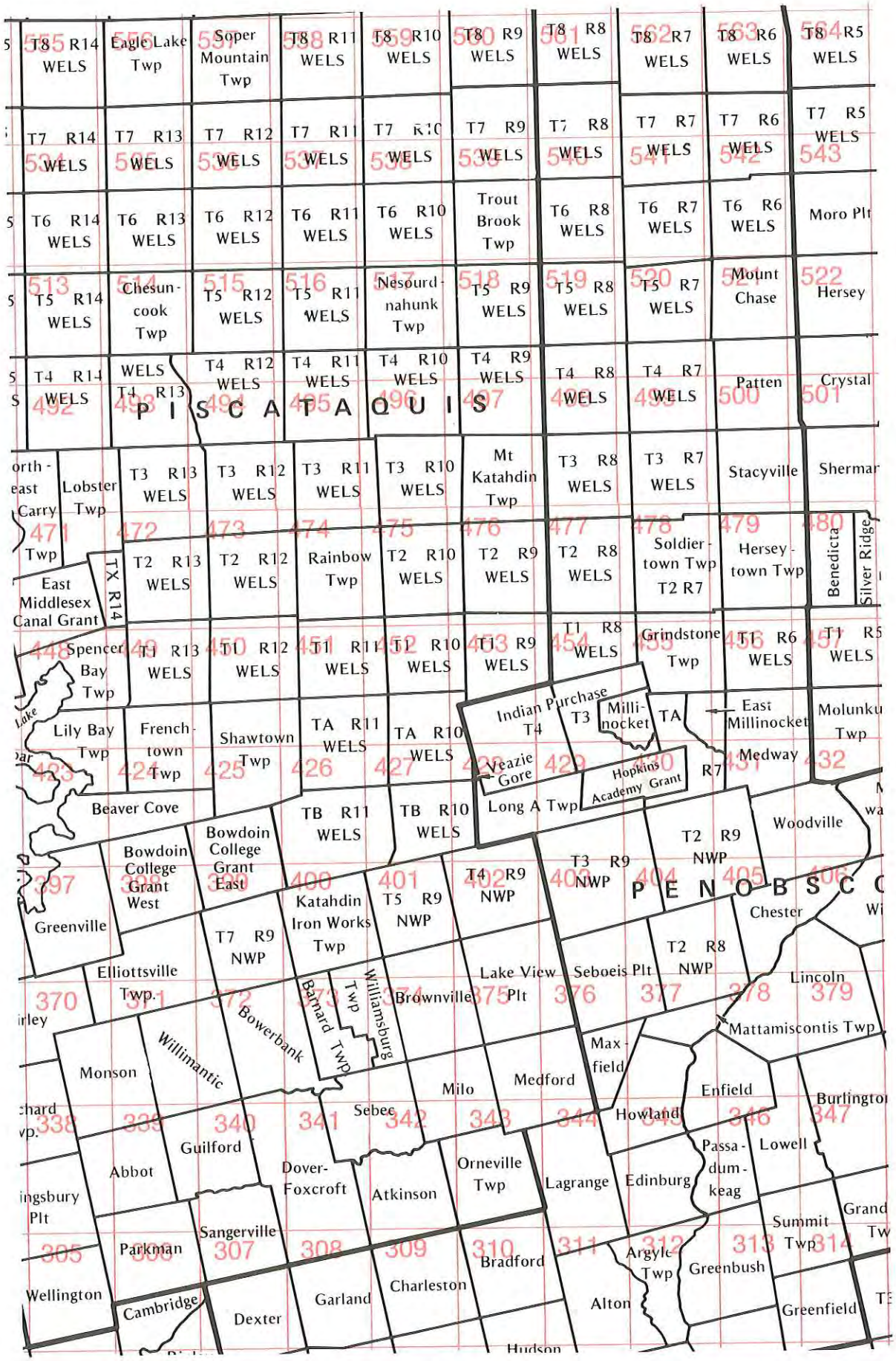
Mid-coast and Central Inland Area Blocks

Figure 3. (continued)



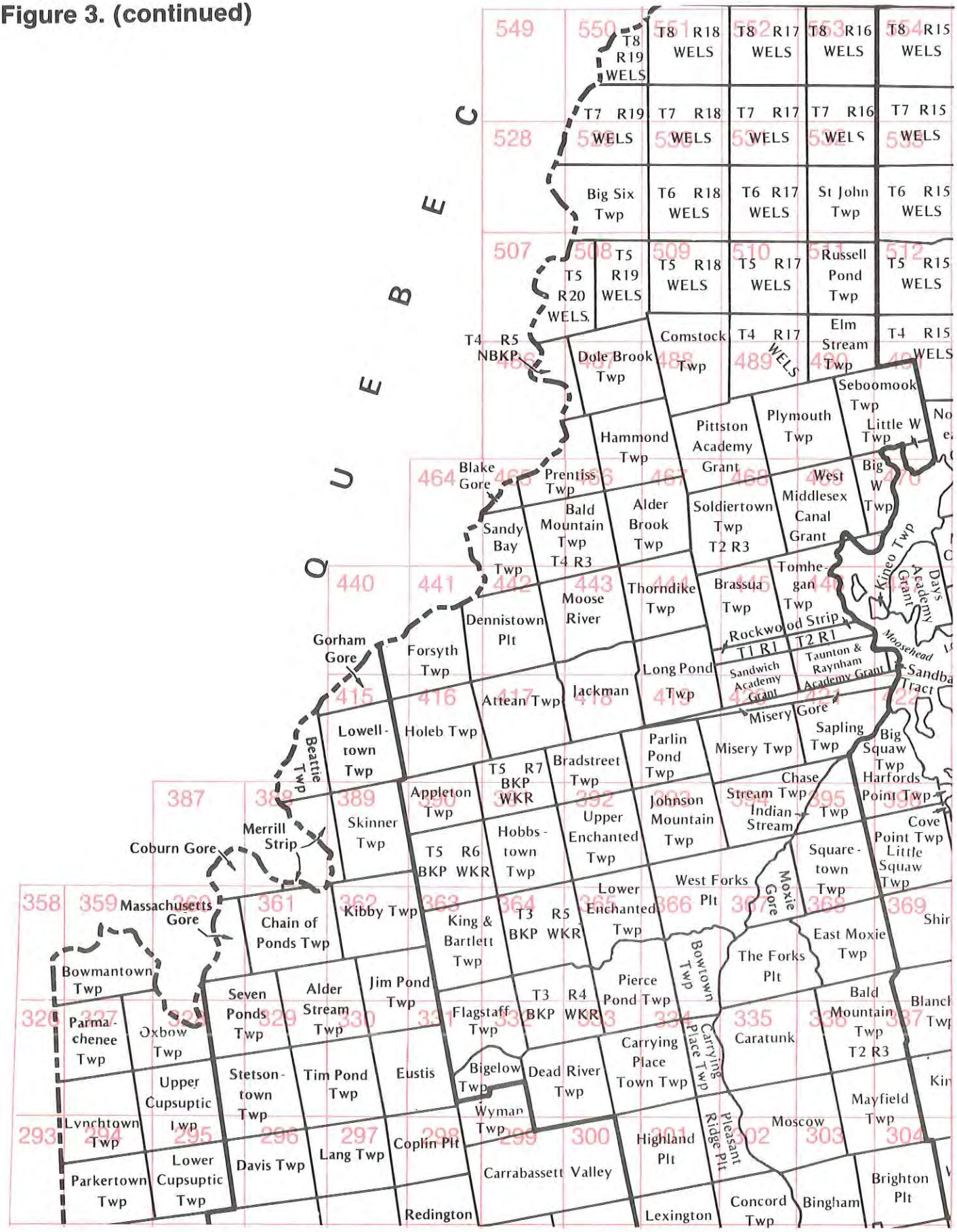
Eastern Coast Area Blocks

Figure 3. (continued)



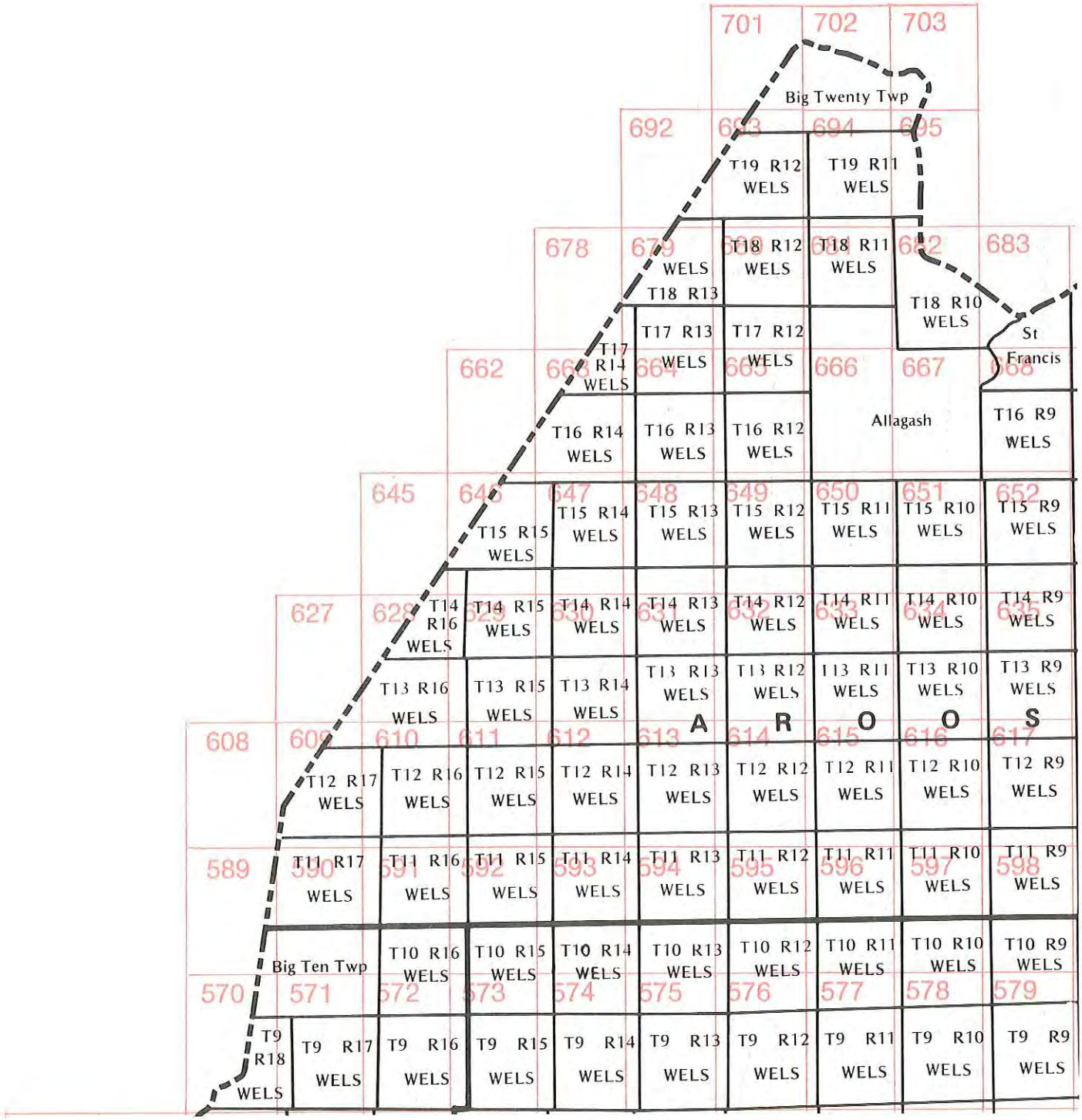
North-central Area Blocks

Figure 3. (continued)



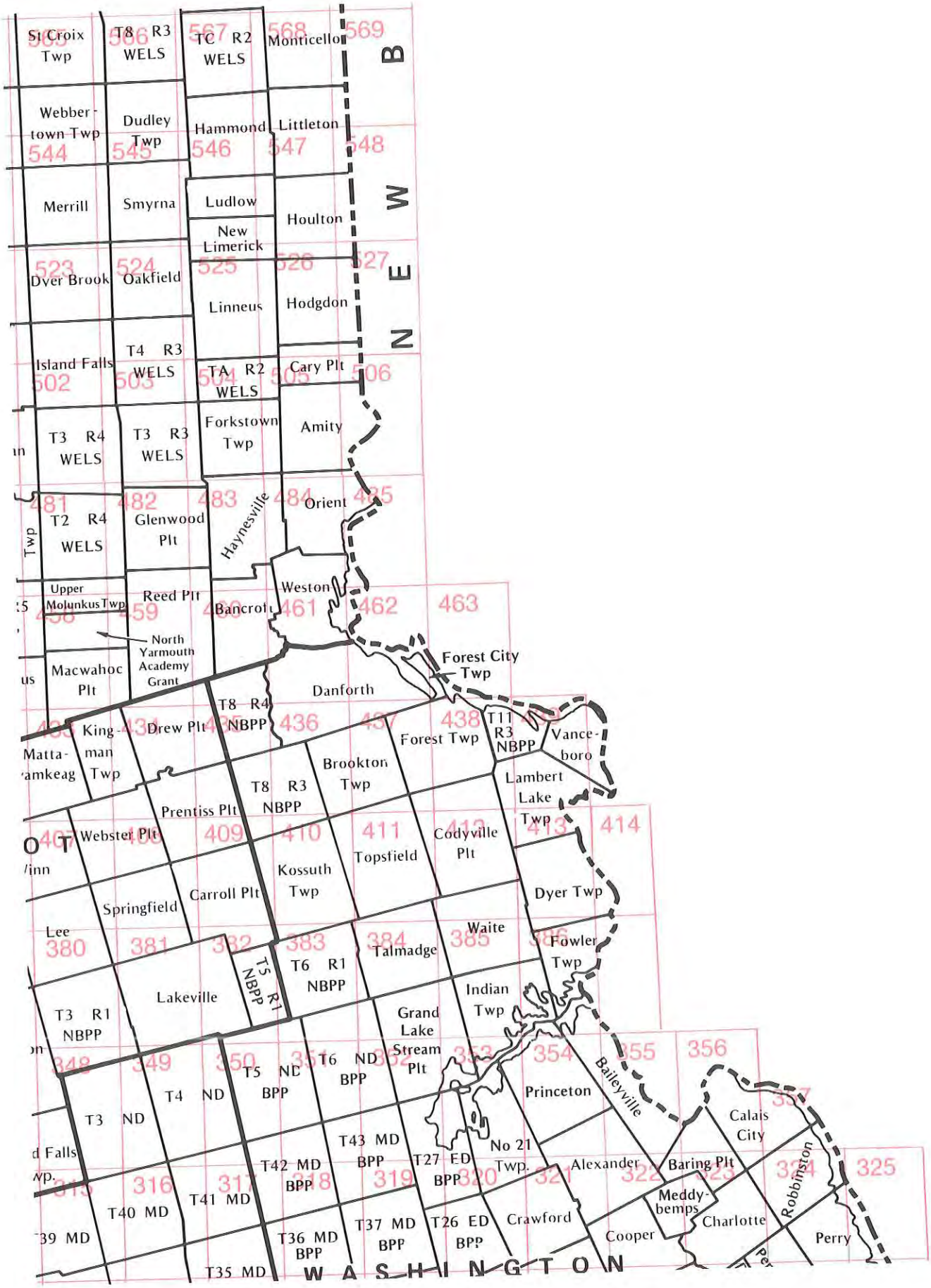
Northwestern Mountain Area Blocks

Figure 3. (continued)



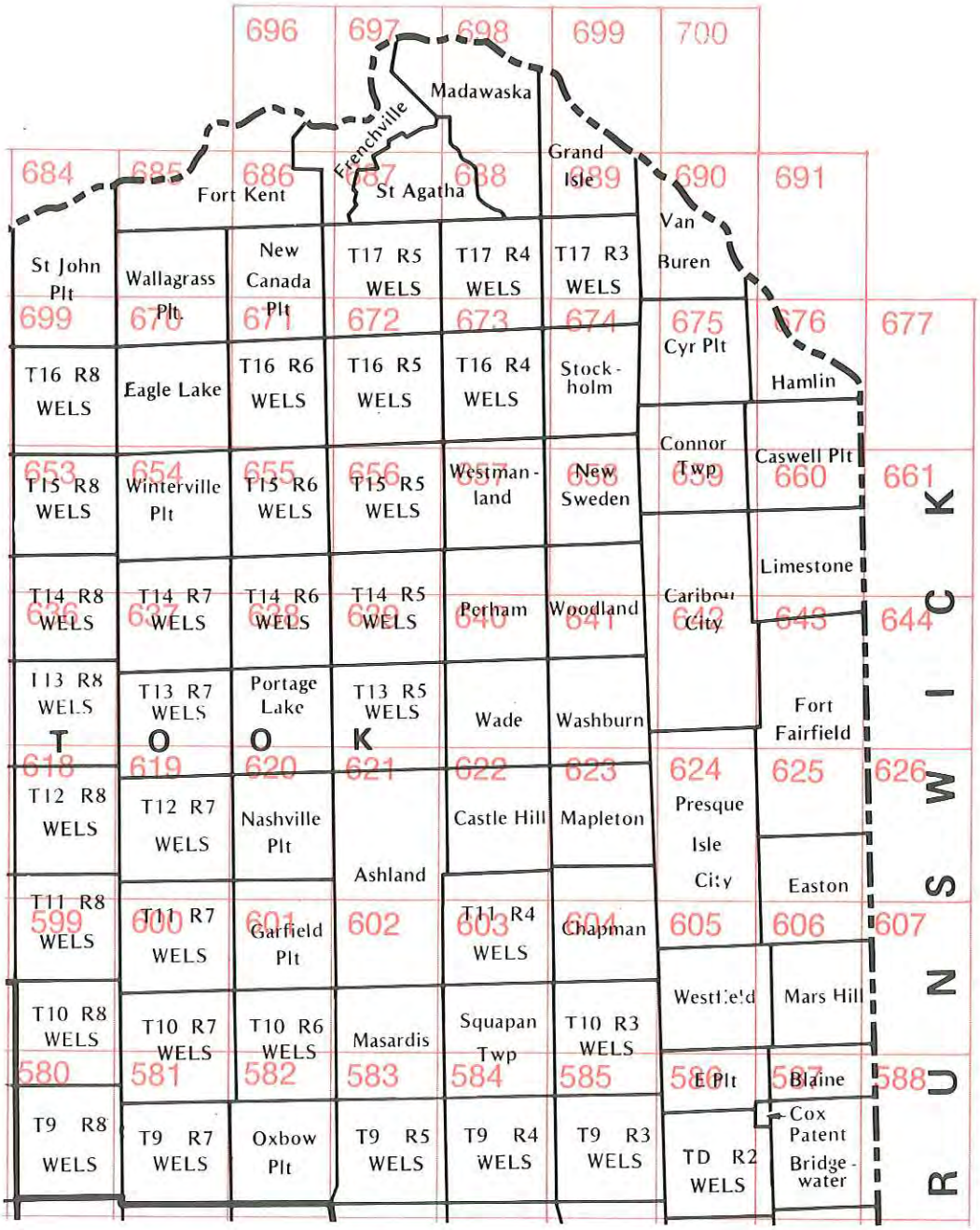
Northwestern St. John - Allagash Area Blocks

Figure 3. (continued)



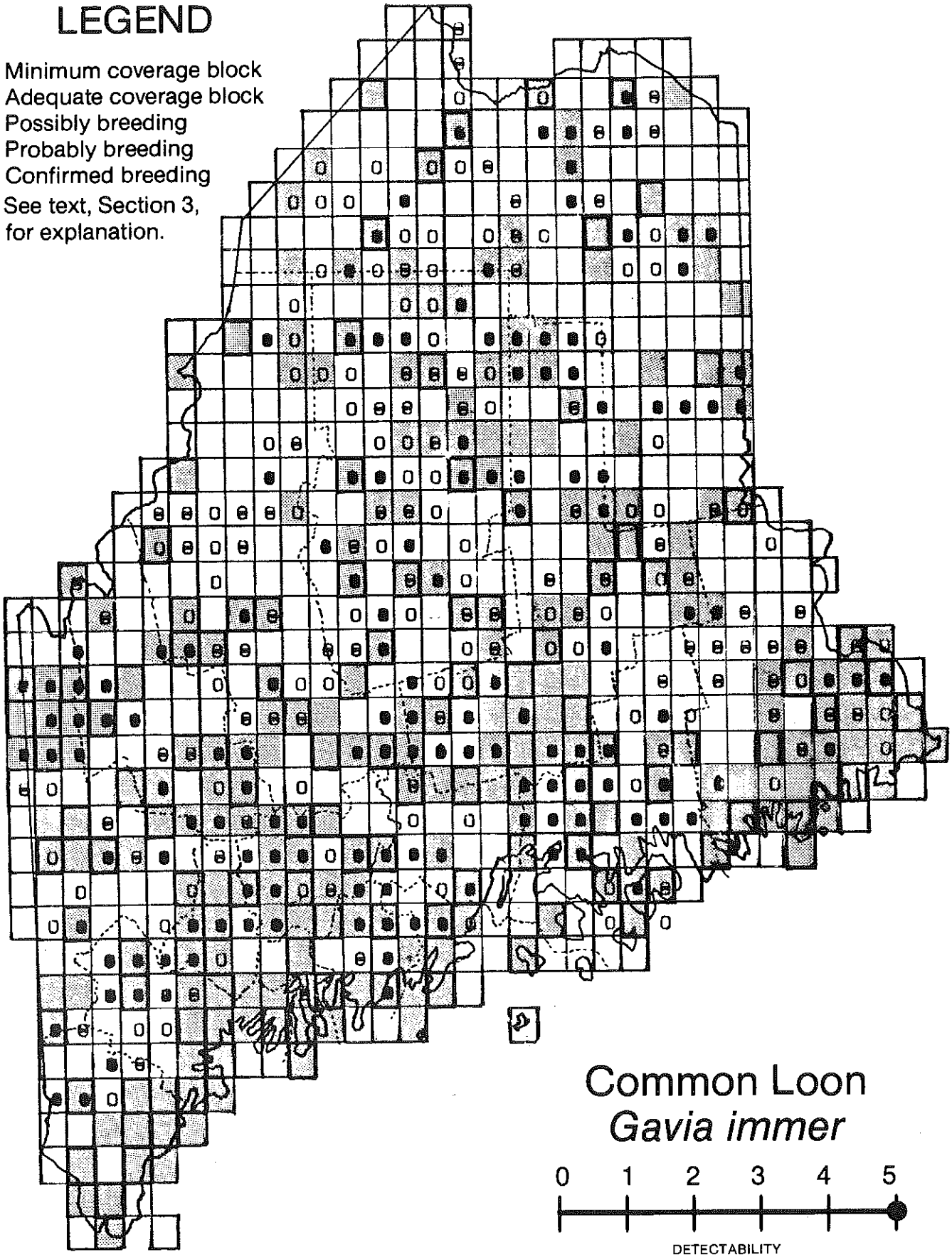
Southern Aroostook - Northern Washington County Area Blocks

Figure 3. (continued)

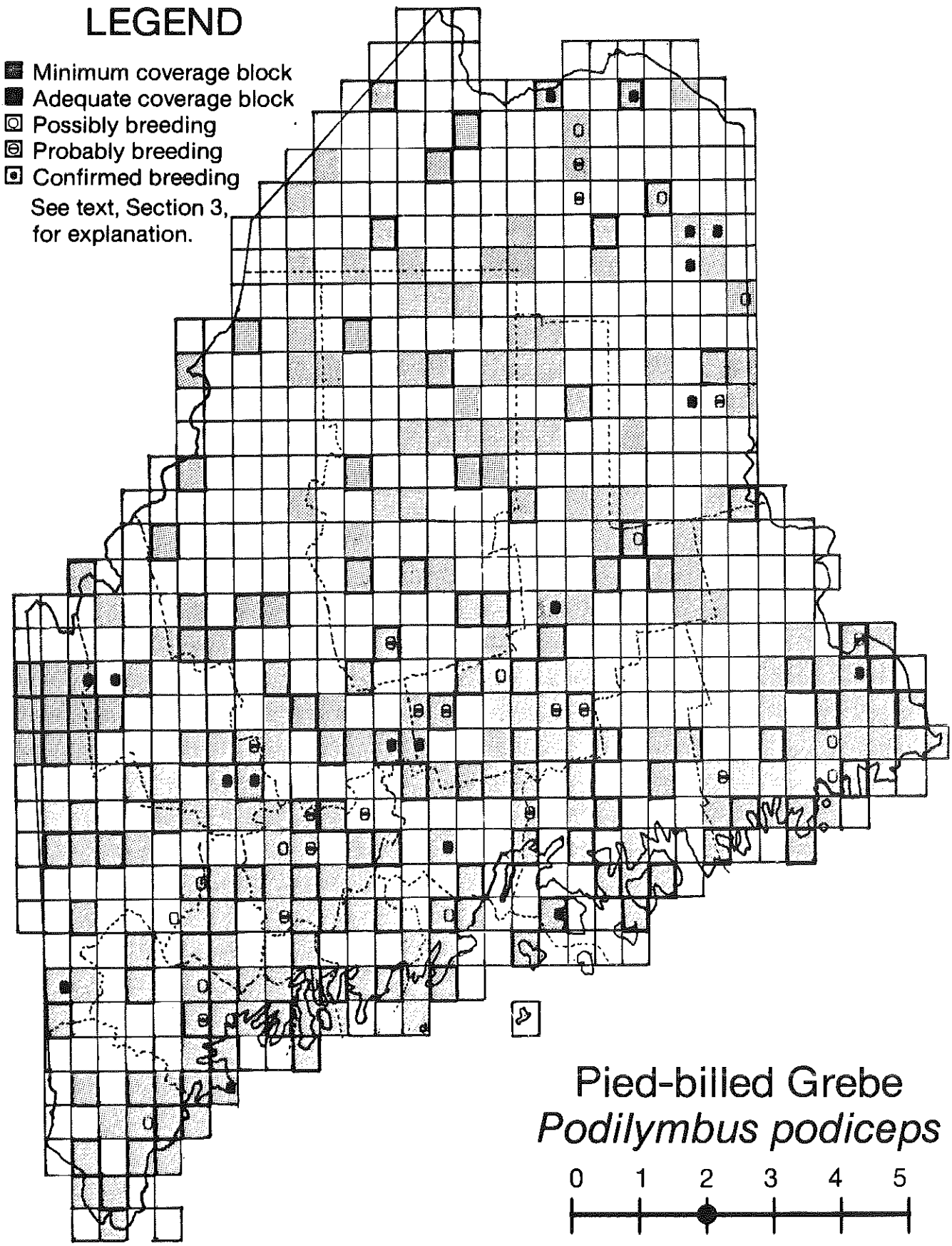


Northeastern Aroostook County Area Blocks

8.0 ANNOTATED SPECIES MAPS



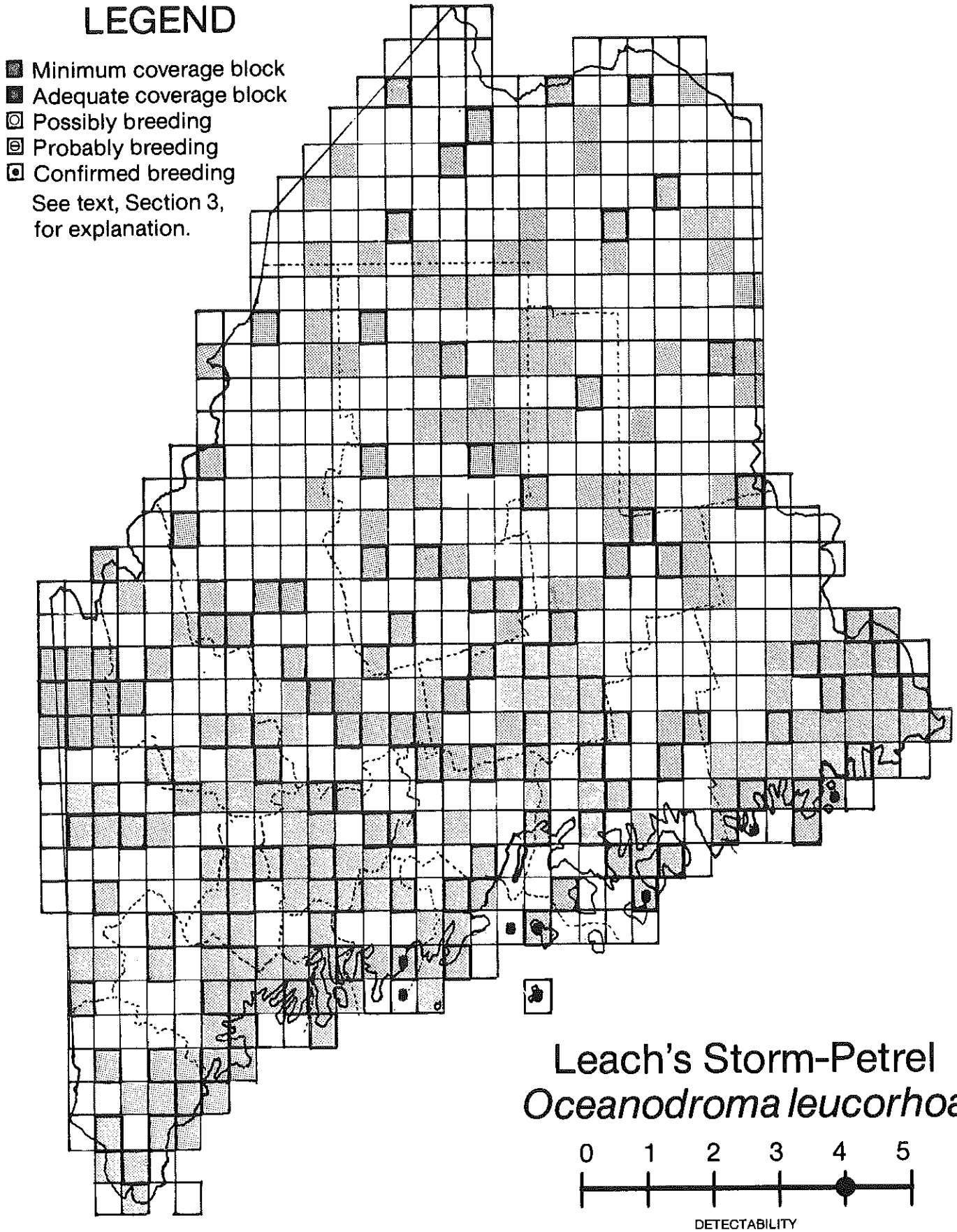
Map includes data from MAS-MDIFW July loon survey.
See Christenson (1981), Christenson and Sherburne (1981).



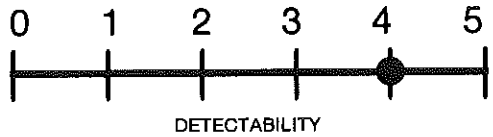
Pied-billed Grebe
Podilymbus podiceps

DETECTABILITY

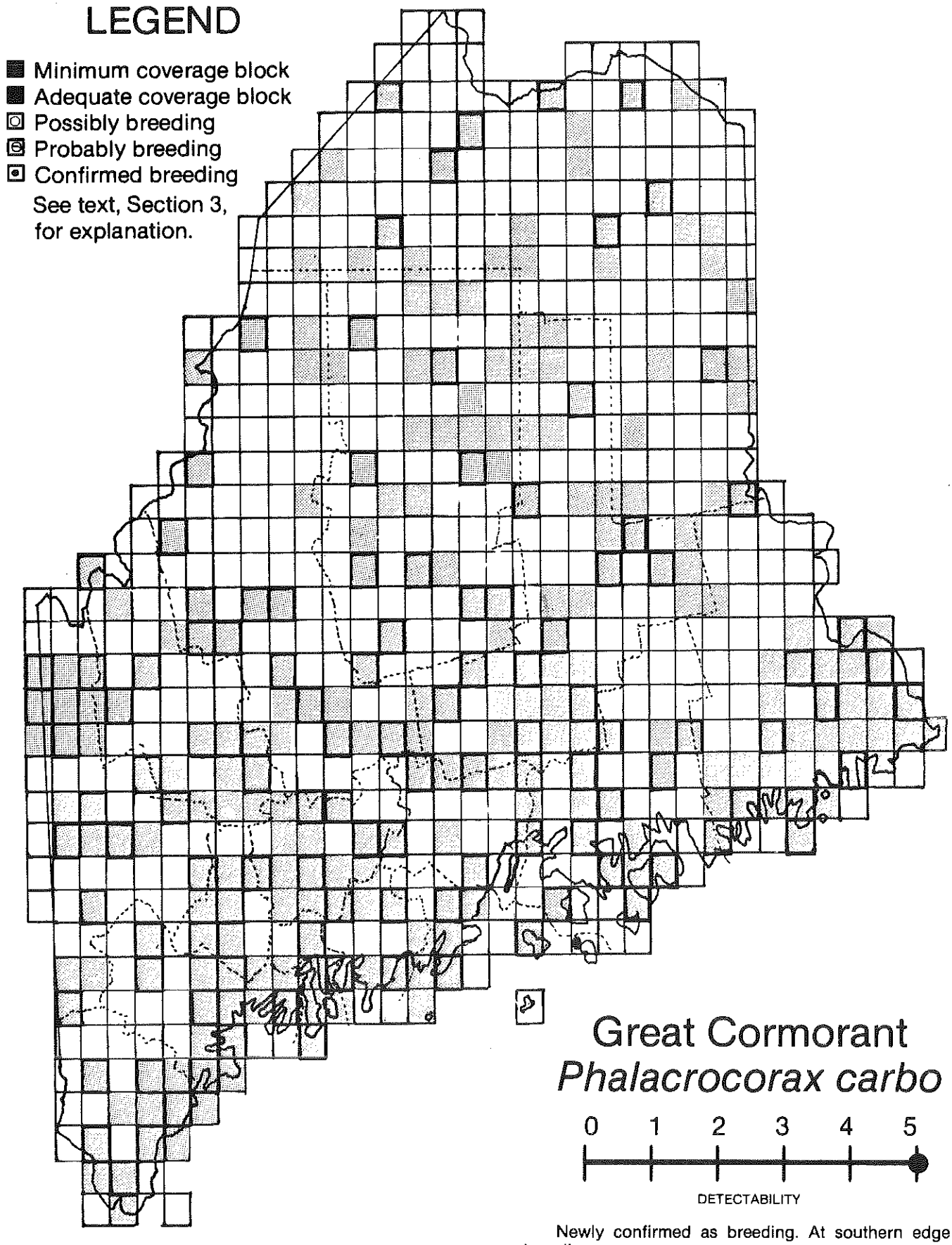
Approaches the northern edge of its breeding range.



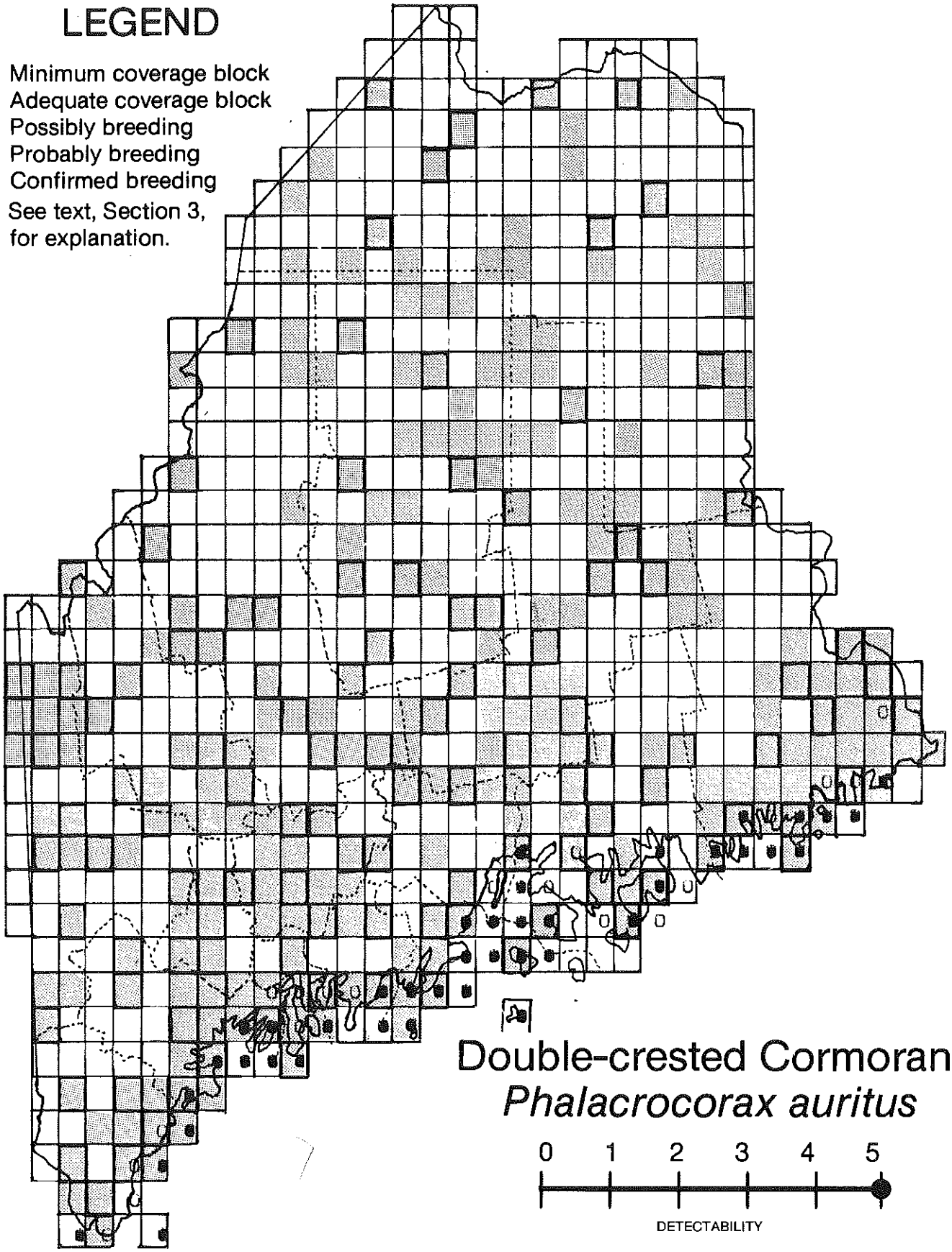
Leach's Storm-Petrel
Oceanodroma leucorhoa



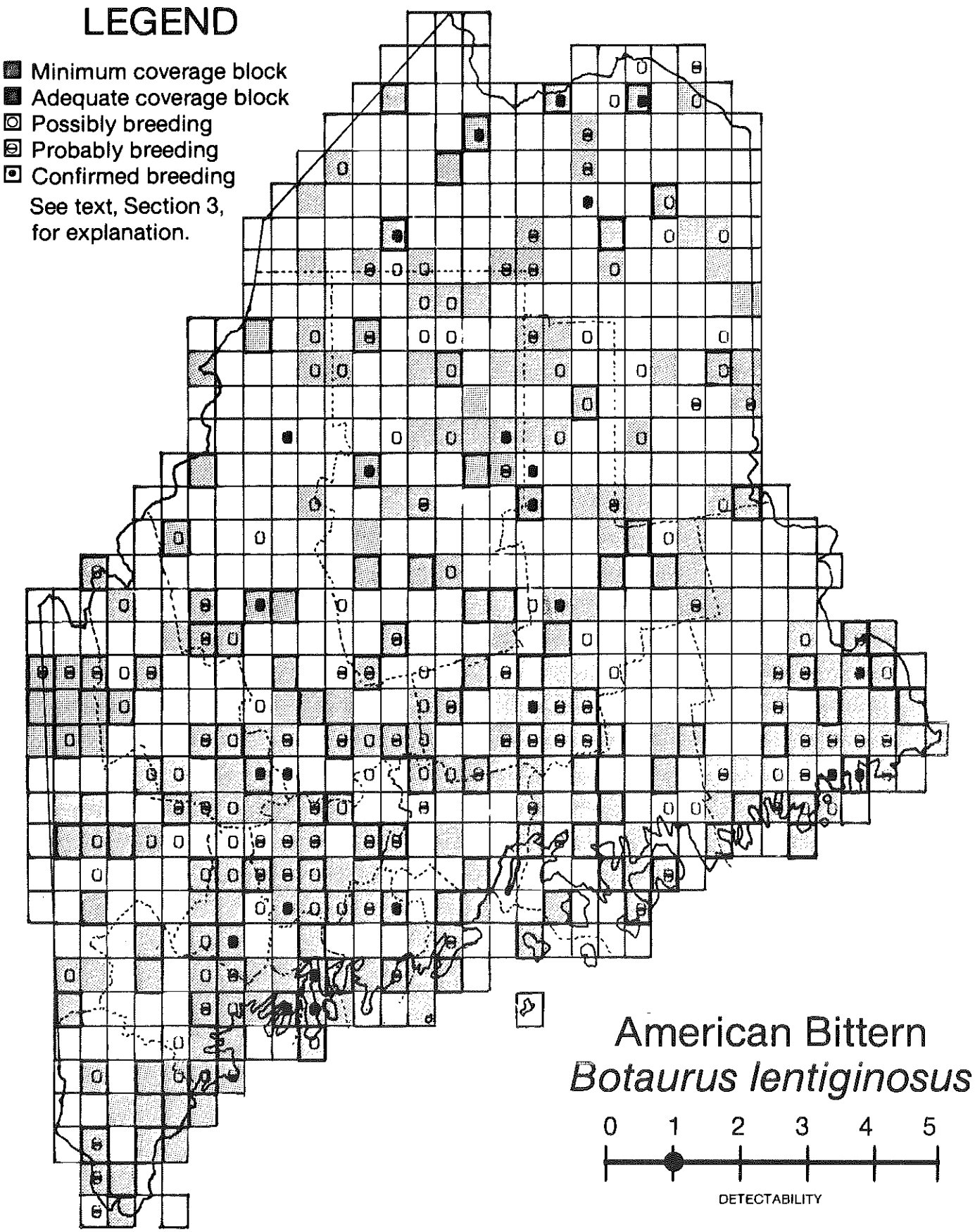
Approaches the southern edge of its breeding range. Data from MDIFW and USFWS surveys included. In 1977, approximately 19,000 pairs bred in 117 colonies on Maine's coastal islands (Korschgen 1979). See Cowger (1975), French (1979).

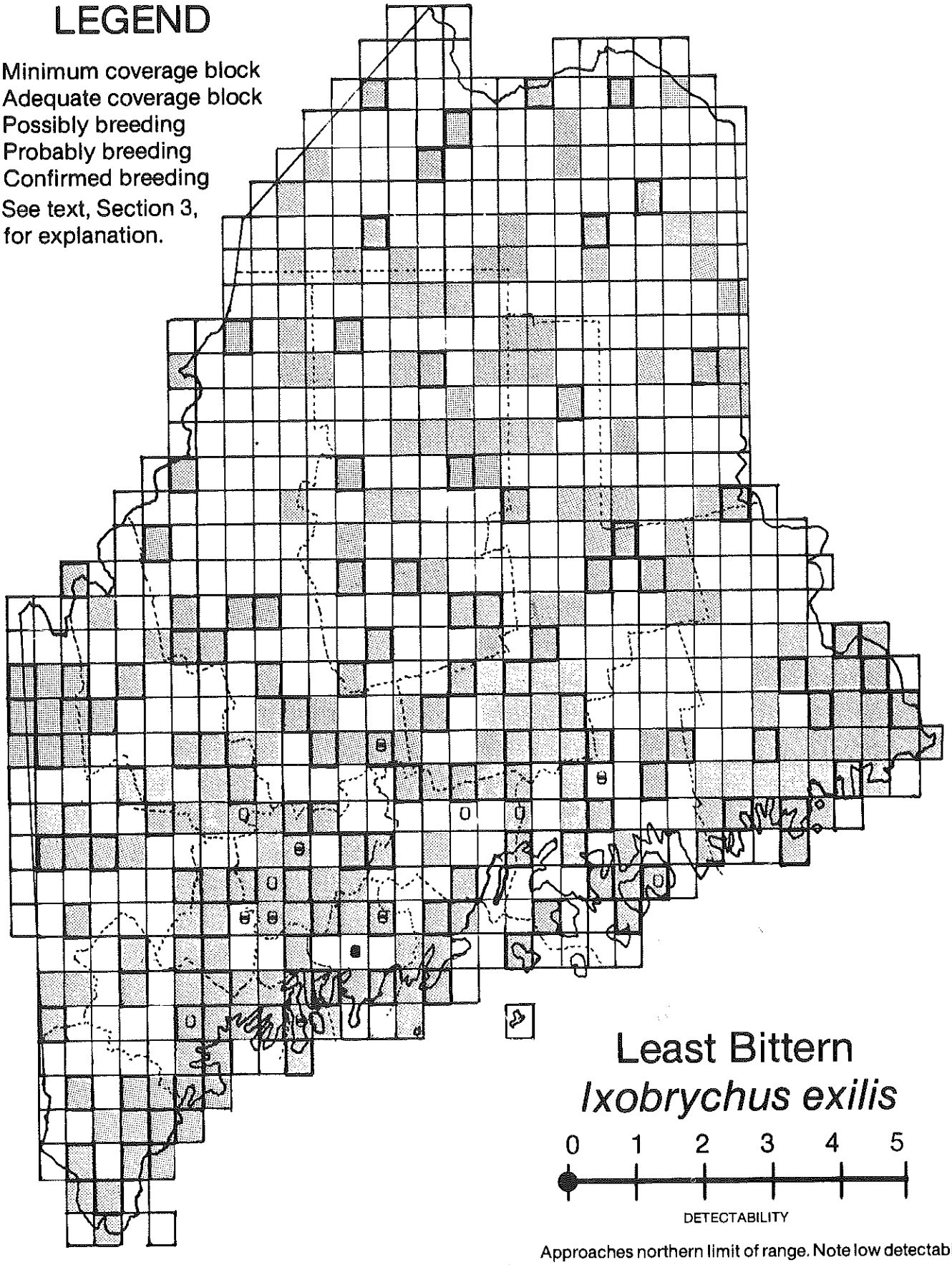


Newly confirmed as breeding. At southern edge of breeding range.



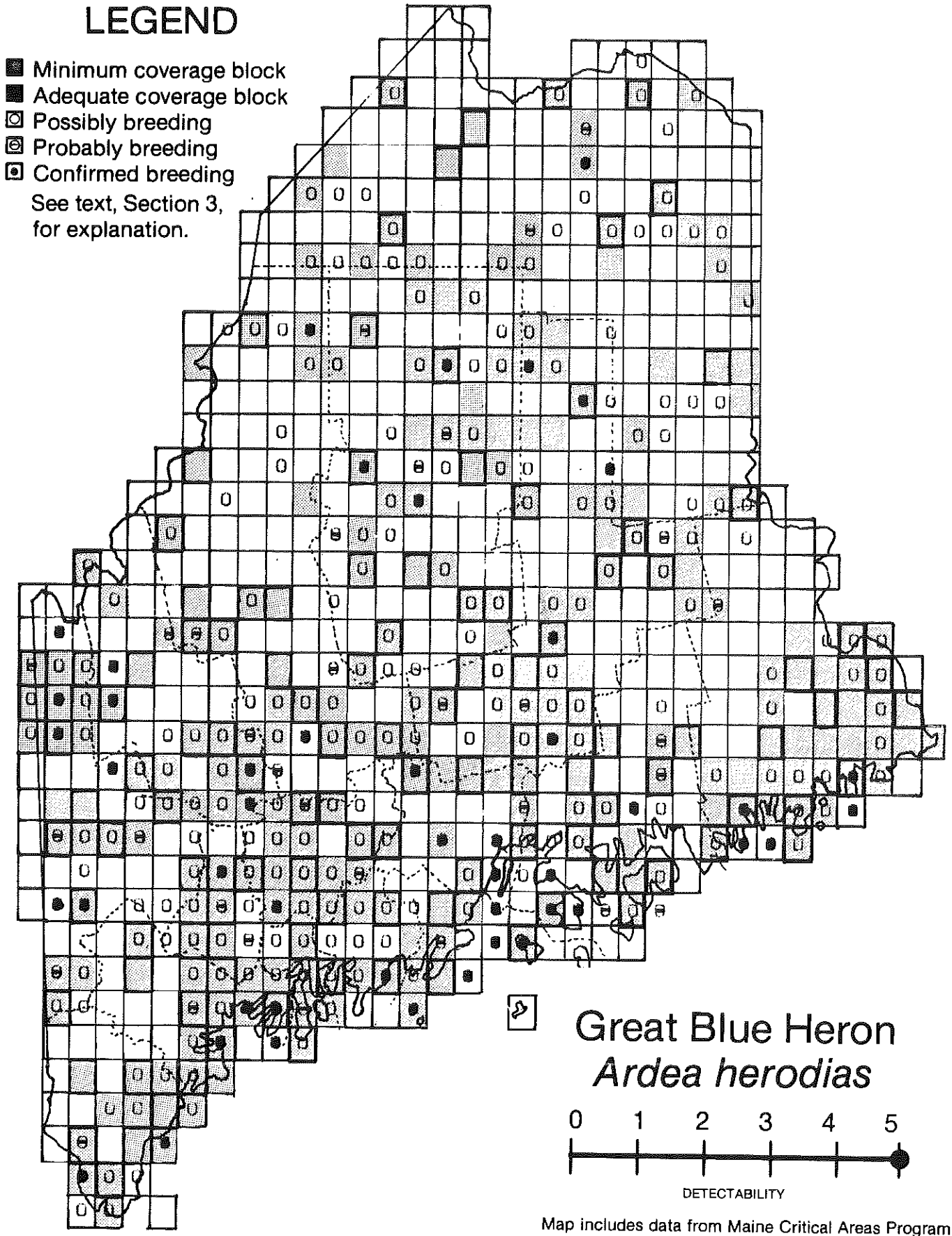
Reaches the southern edge of its breeding range at Isles of Shoals. Data from MDIFW and USFWS surveys included. Inland occurrences are nonbreeding individuals. In 1977, approximately 15,333 pairs bred on 103 coastal islands (Korschgen 1979). See also Drury (1973).


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
American Bittern
Botaurus lentiginosus
0 1 2 3 4 5
DETECTABILITY



Least Bittern
Ixobrychus exilis

Approaches northern limit of range. Note low detectability score.

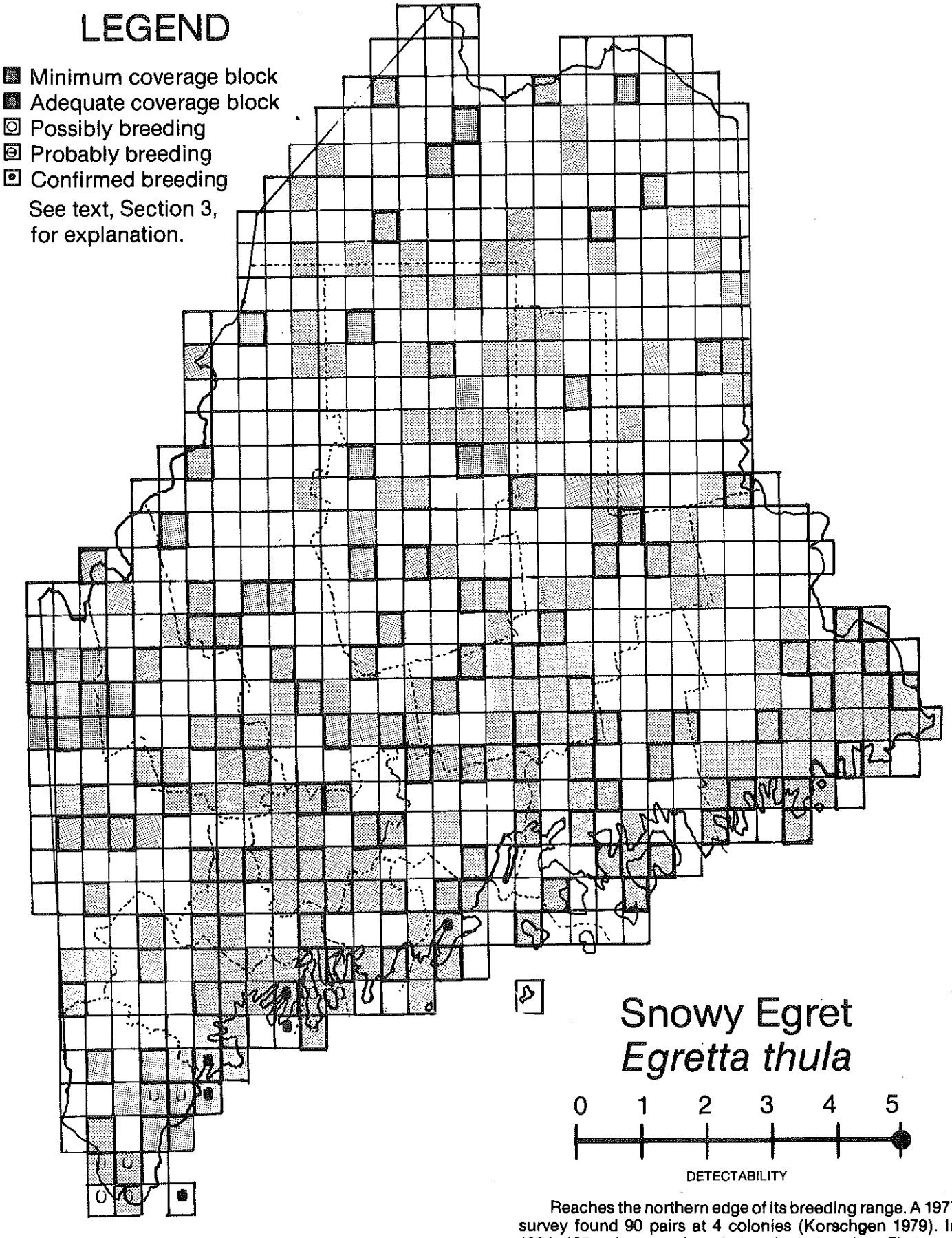


Great Blue Heron
Ardea herodias

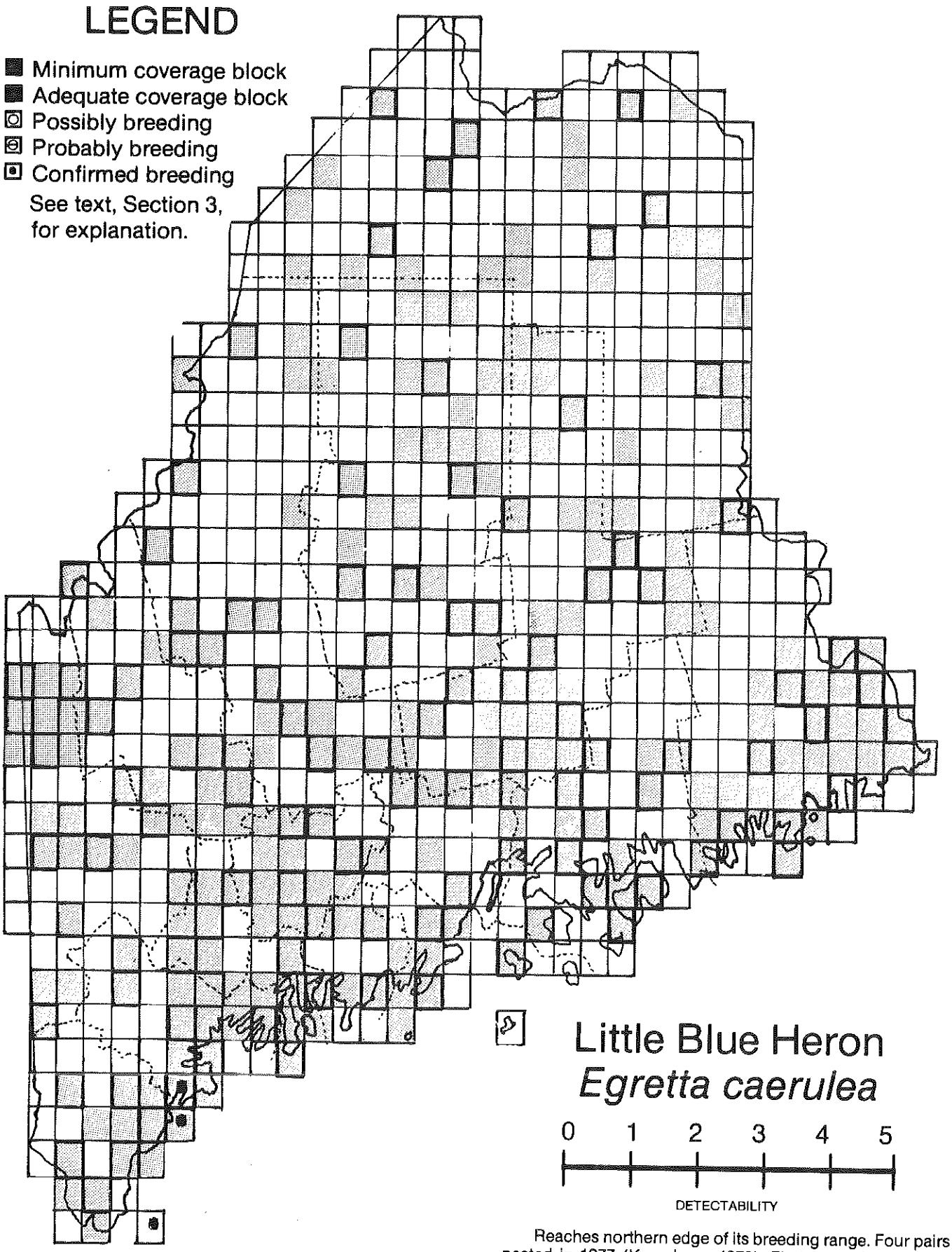
0 1 2 3 4 5

DETECTABILITY

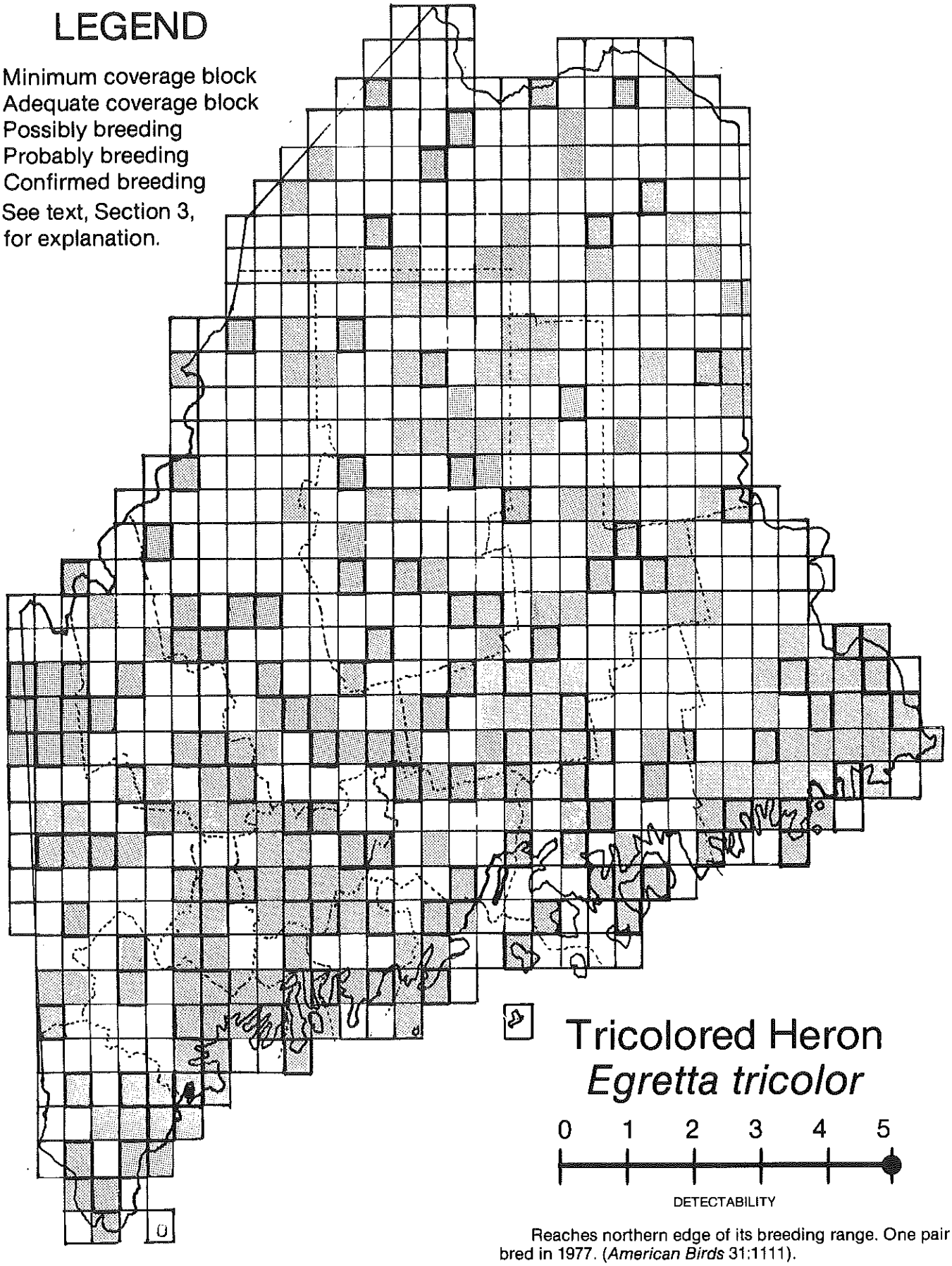
Map includes data from Maine Critical Areas Program, and MDIFW and USFWS surveys, which in 1977 found 903 pairs breeding in 18 coastal colonies (Korschgen 1979). See also Tyler (1977).



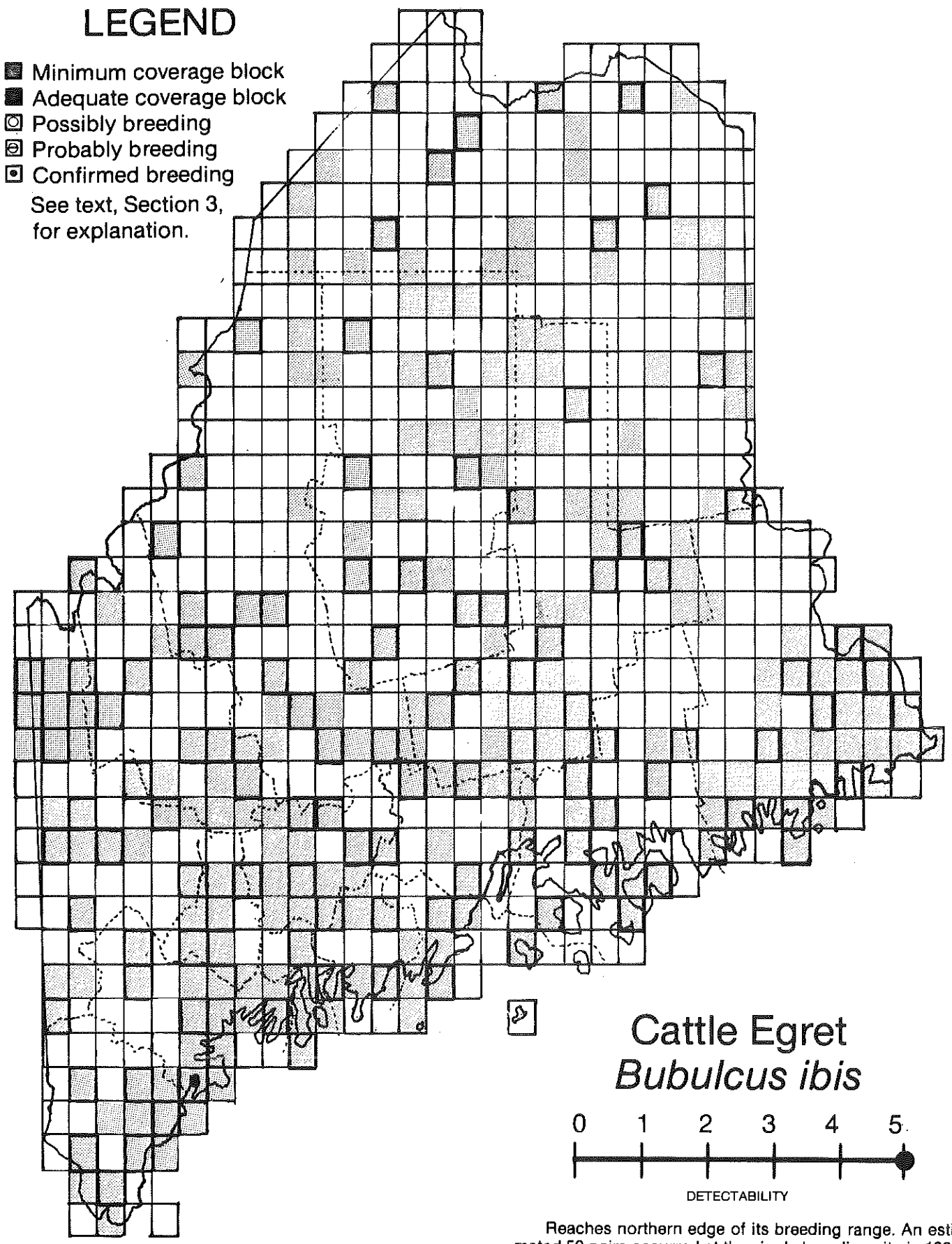
Reaches the northern edge of its breeding range. A 1977 survey found 90 pairs at 4 colonies (Korschgen 1979). In 1984, 125 pairs were found at a single location. First confirmed breeding in Maine in 1961 (*Audubon Field Notes* 15:450). See Tyler (1977).



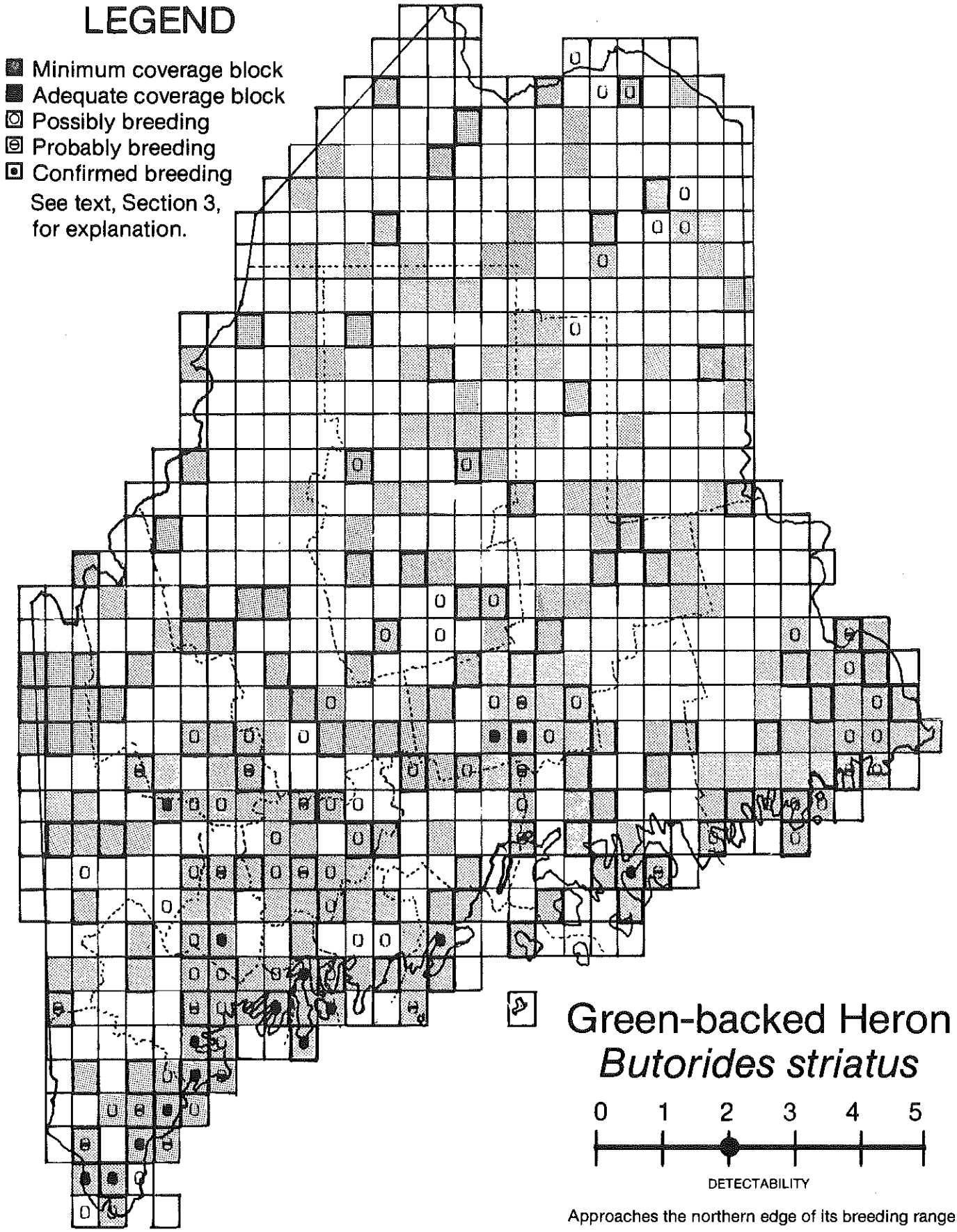
Reaches northern edge of its breeding range. Four pairs nested in 1977 (Korschgen 1979). First found breeding in Maine in 1971 (*American Birds* 25:831). See also Tyler (1977).

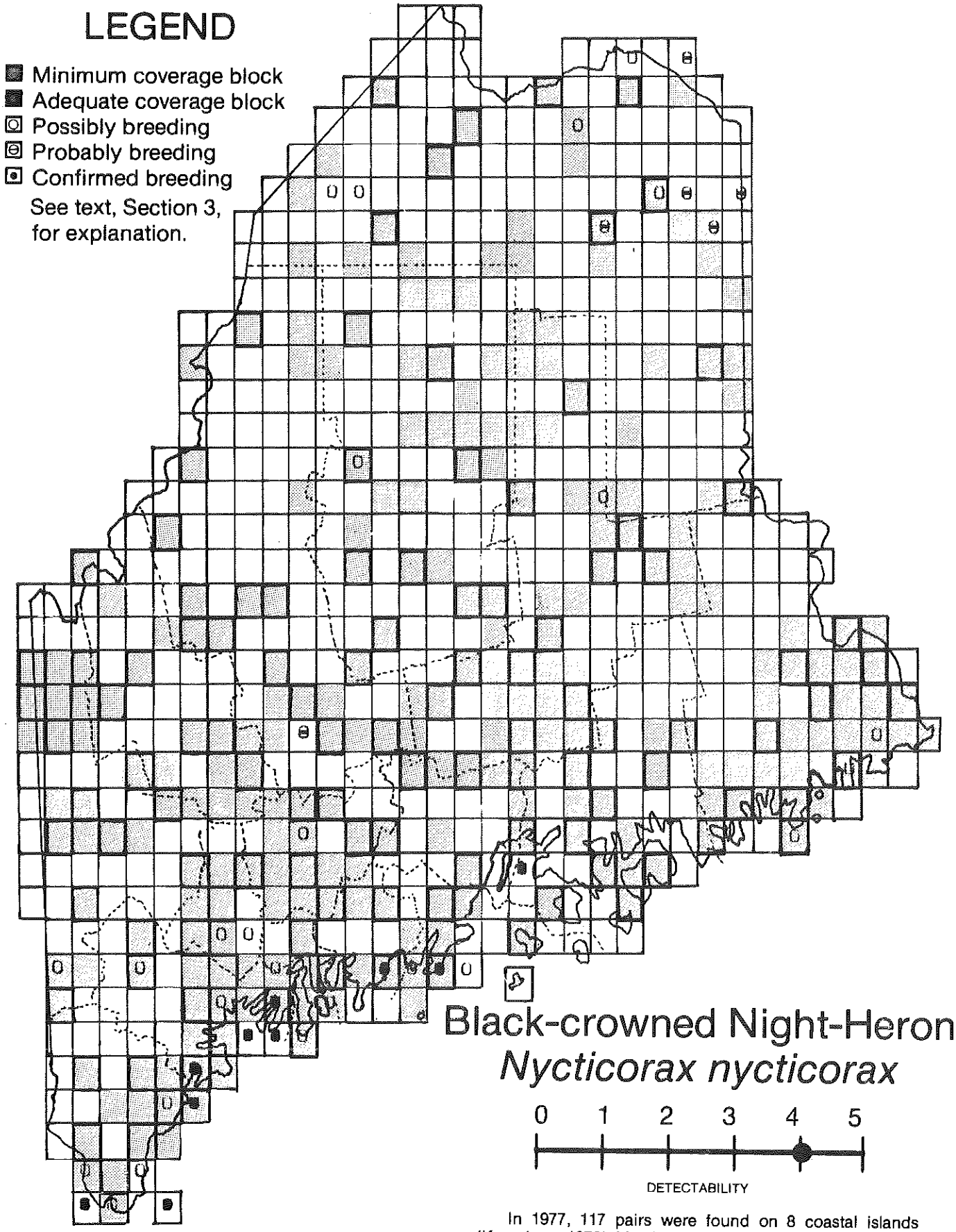


Reaches northern edge of its breeding range. One pair bred in 1977. (*American Birds* 31:1111).

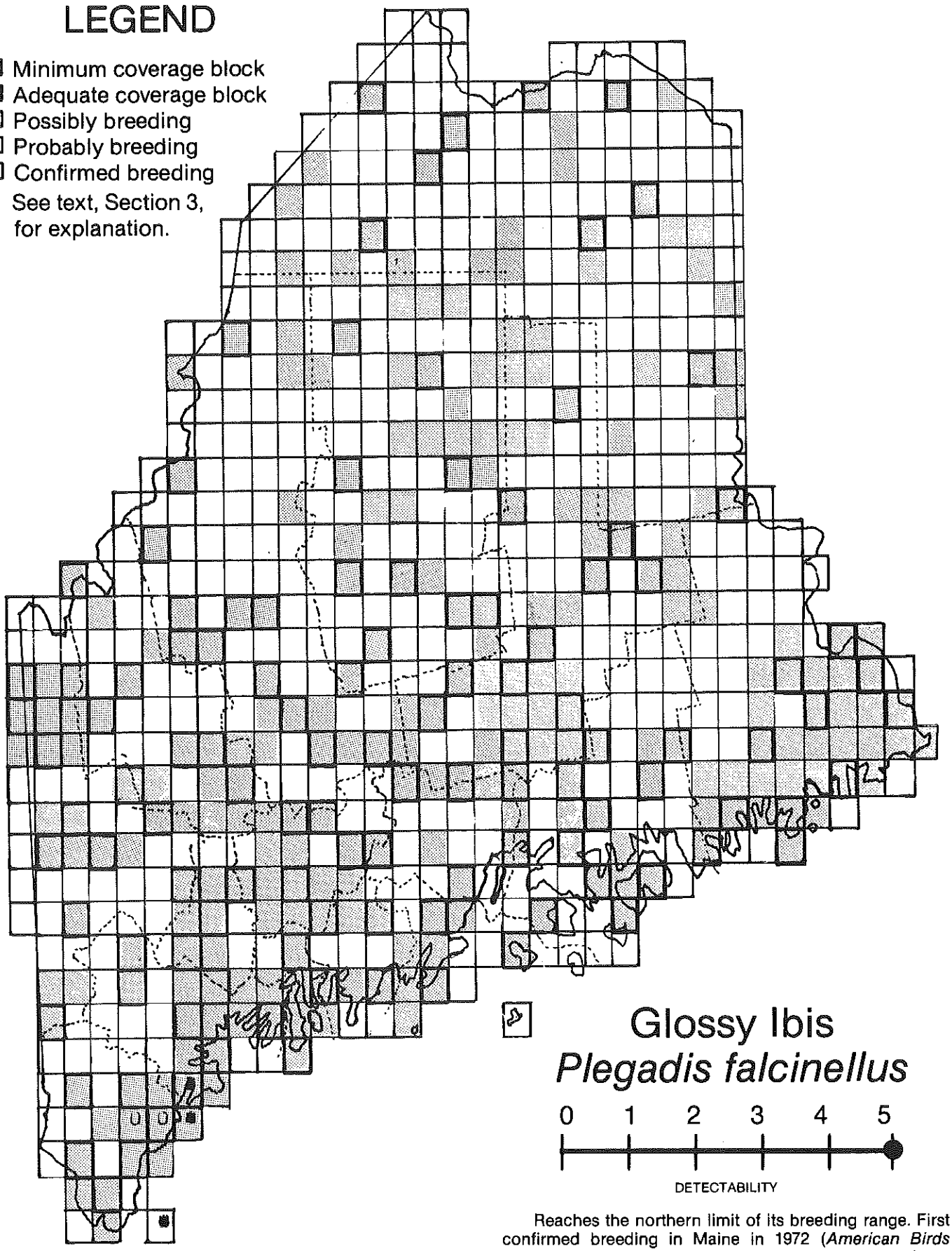


Reaches northern edge of its breeding range. An estimated 50 pairs occurred at the single breeding site in 1984 (MAS data).


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Green-backed Heron
Butorides striatus
0 1 2 3 4 5
DETECTABILITY
Approaches the northern edge of its breeding range.



In 1977, 117 pairs were found on 8 coastal islands (Korschgen 1979). Map includes MDIFW, USFWS, and Critical Areas Program data. See also Tyler (1977).

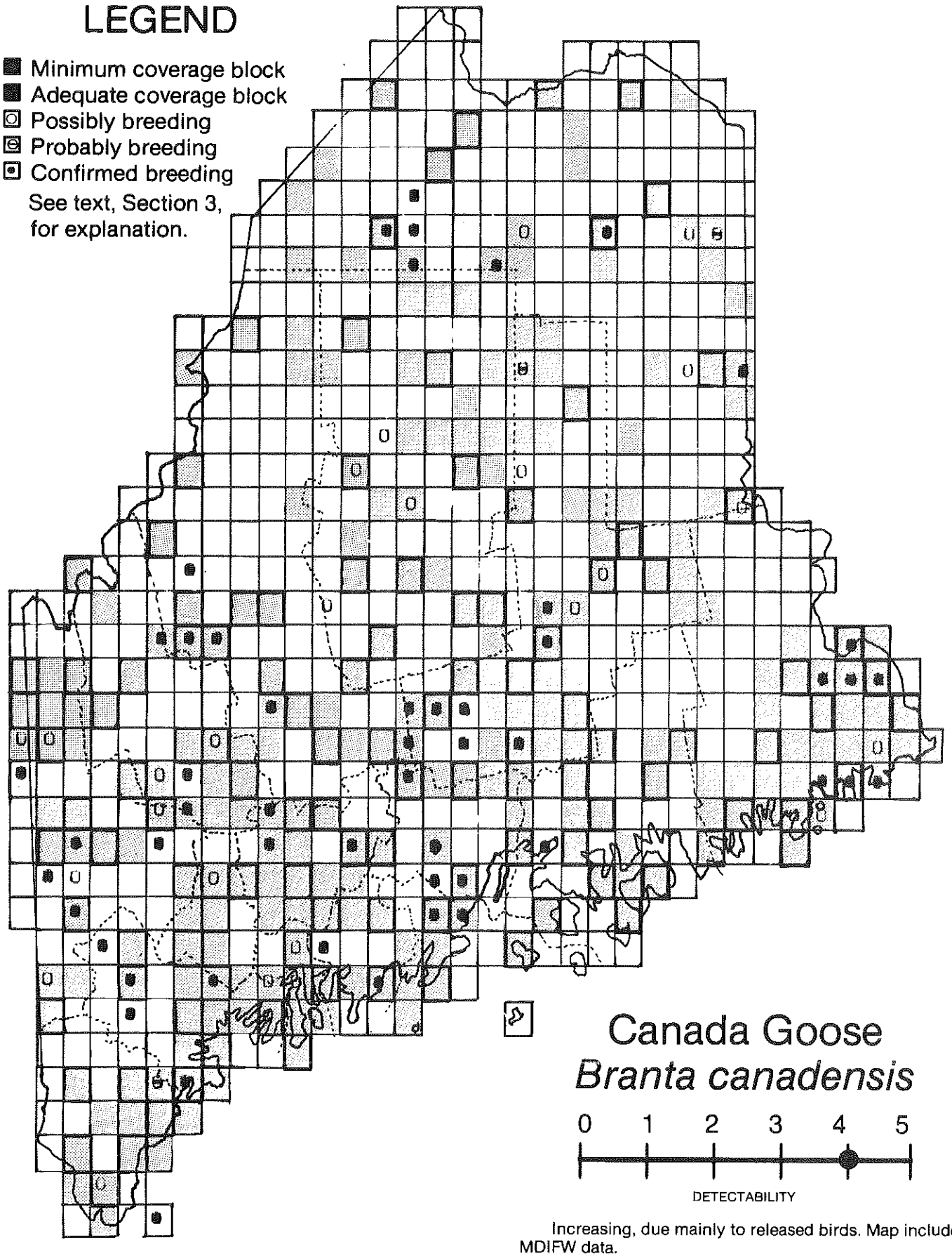


Glossy Ibis
Plegadis falcinellus

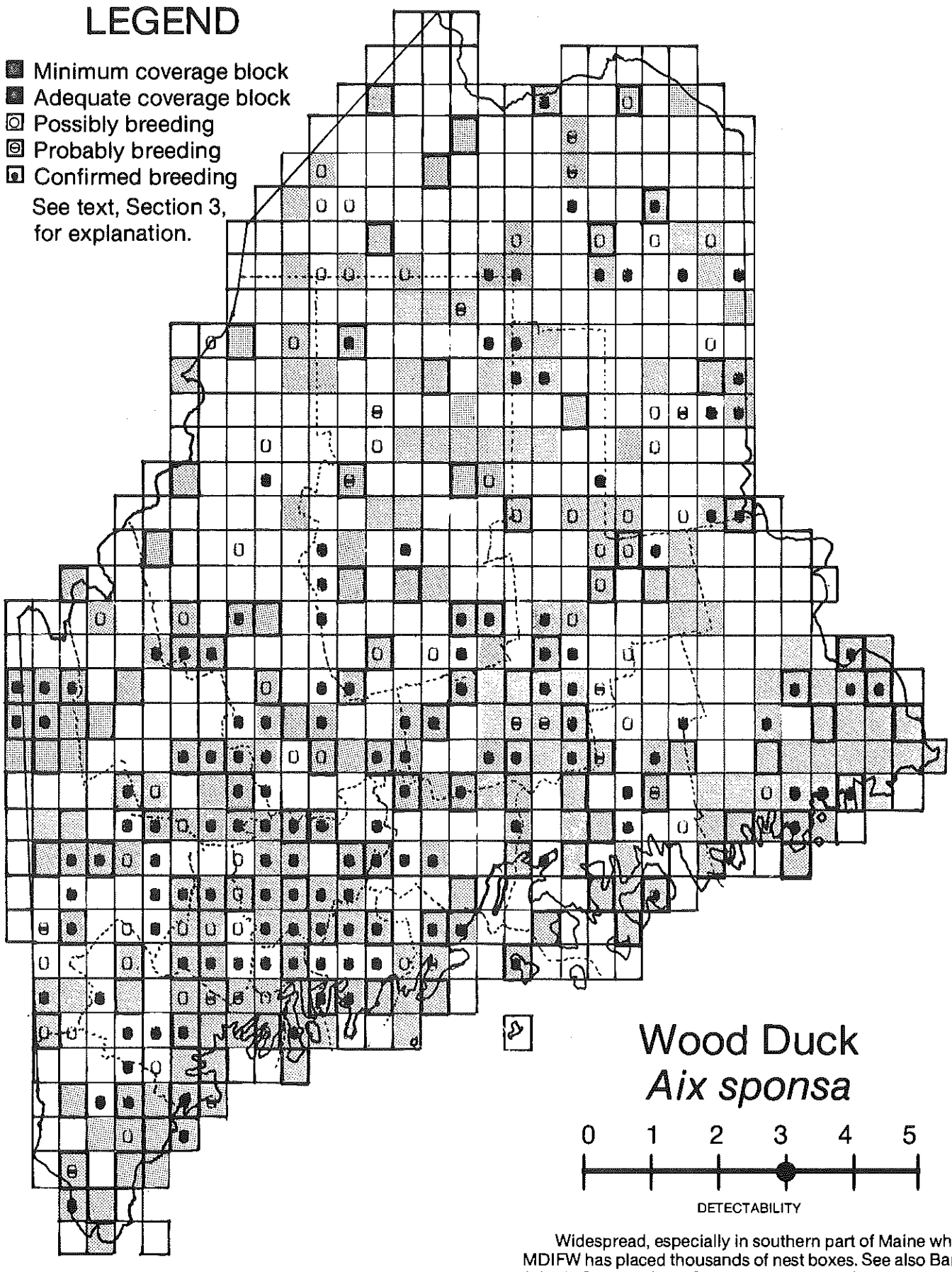
0 1 2 3 4 5

DETECTABILITY

Reaches the northern limit of its breeding range. First confirmed breeding in Maine in 1972 (*American Birds* 26:834). In 1984, an estimated 100 pairs nested at one location. See also Tyler (1977).

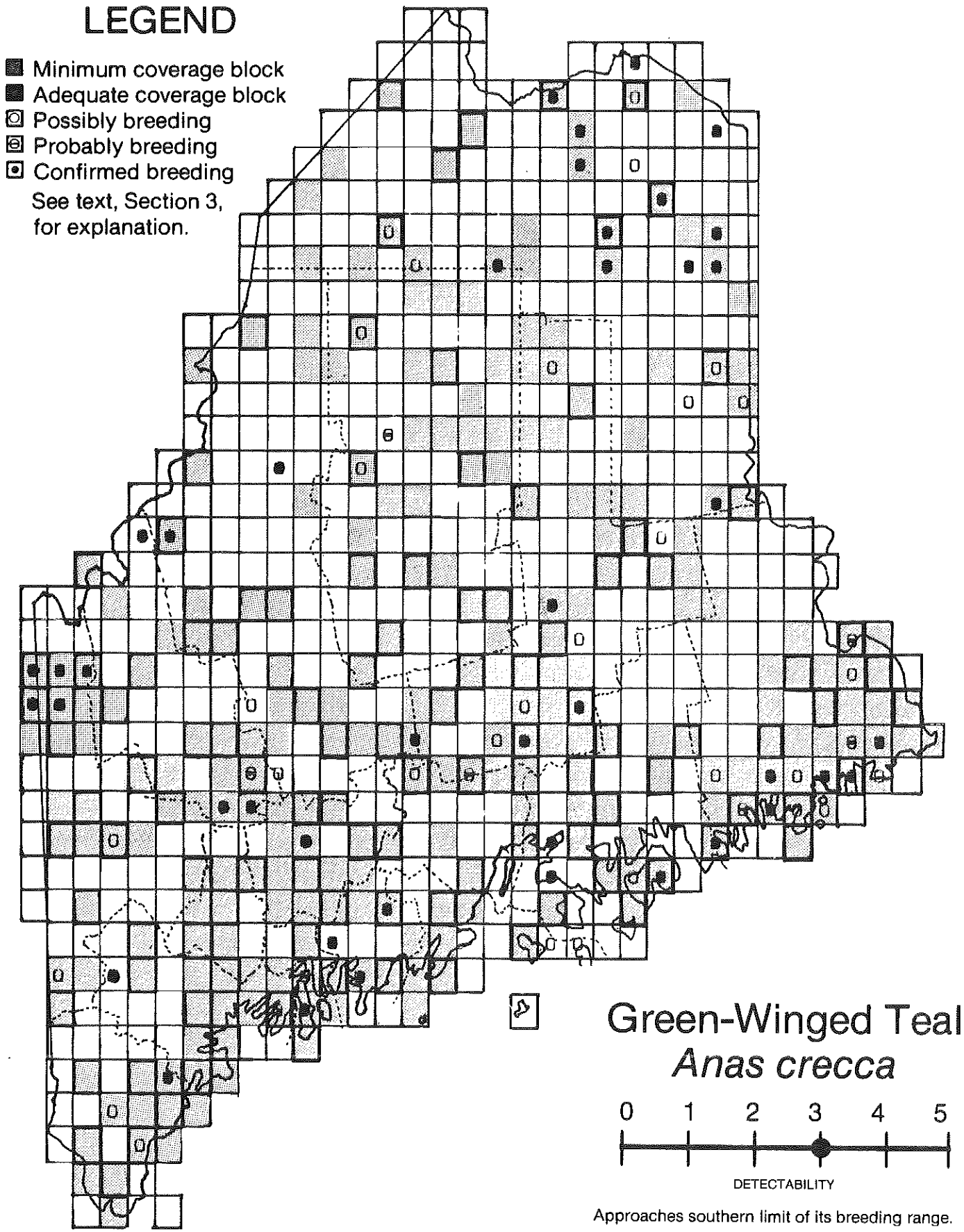


Increasing, due mainly to released birds. Map includes MDIFW data.

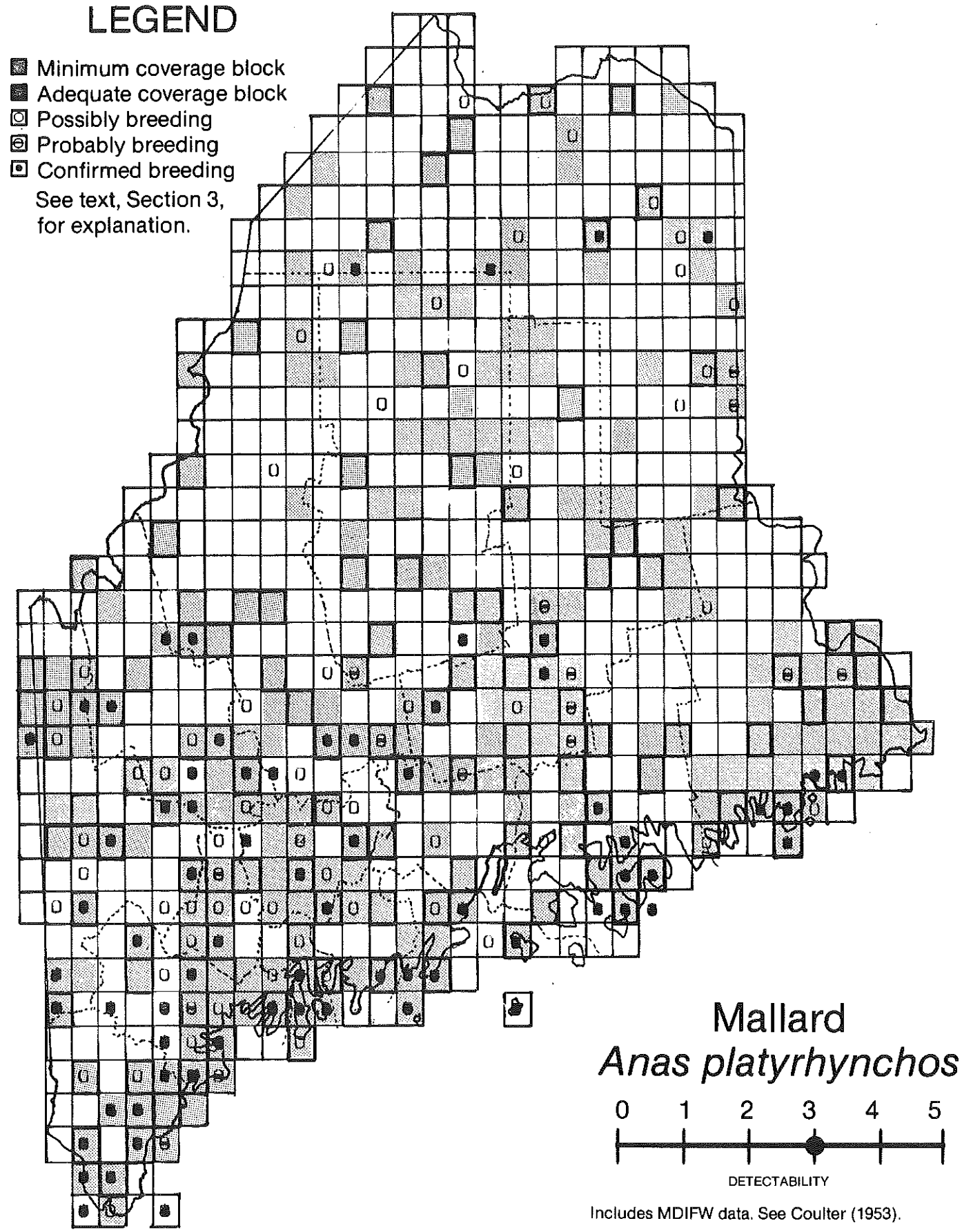


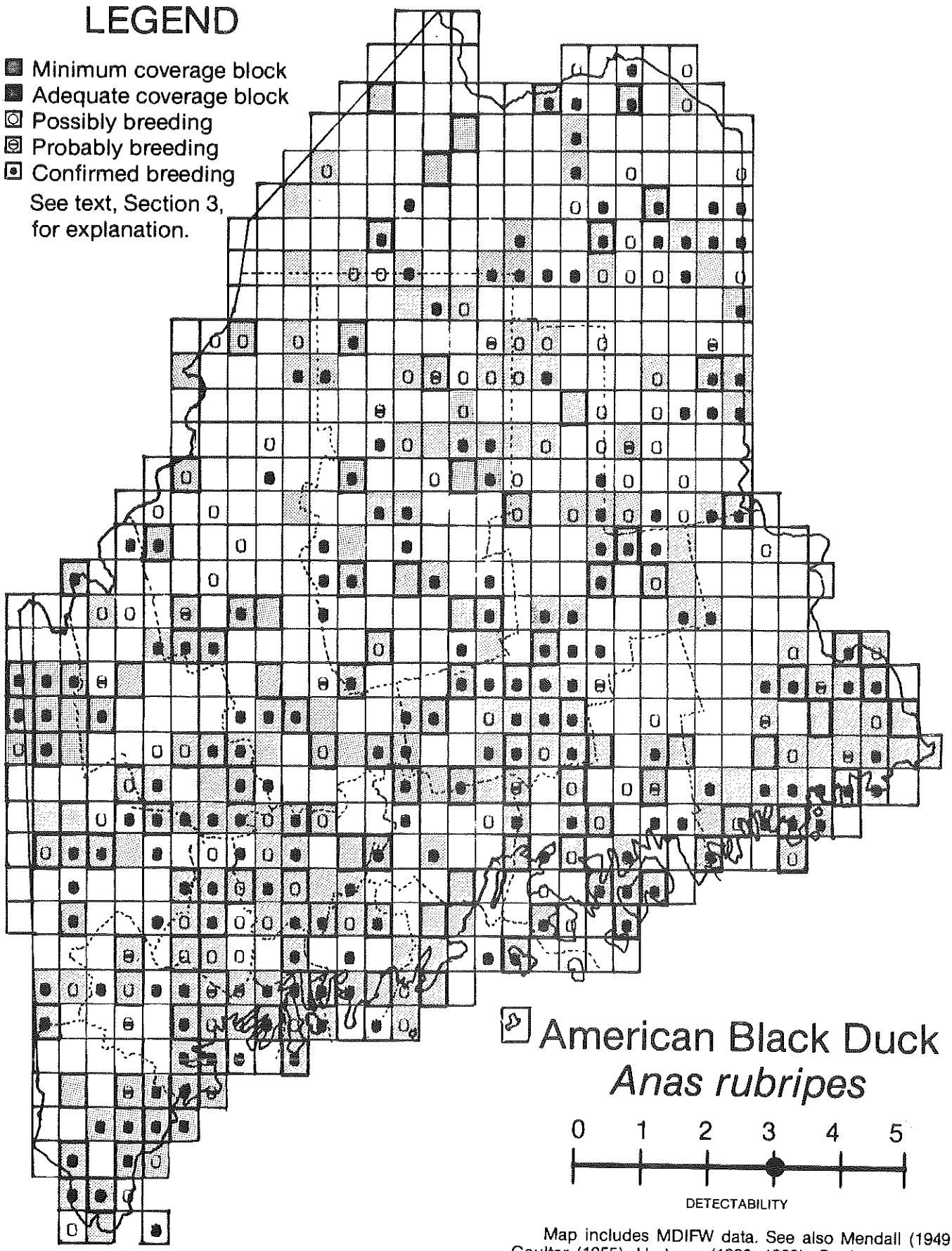
Wood Duck
Aix sponsa

Widespread, especially in southern part of Maine where MDIFW has placed thousands of nest boxes. See also Barter (1968), Capen (1972), Sousa and Farmer (1983).

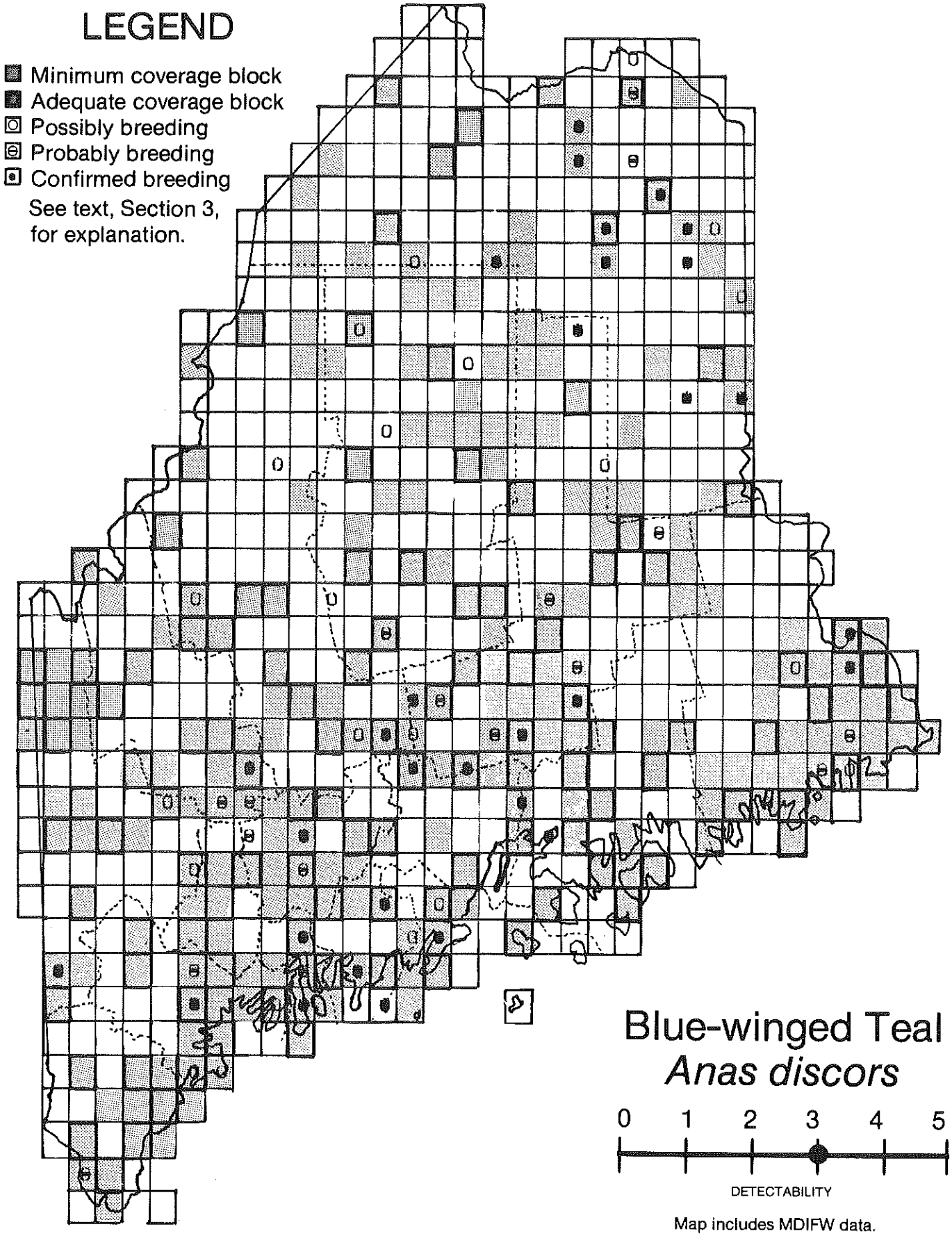


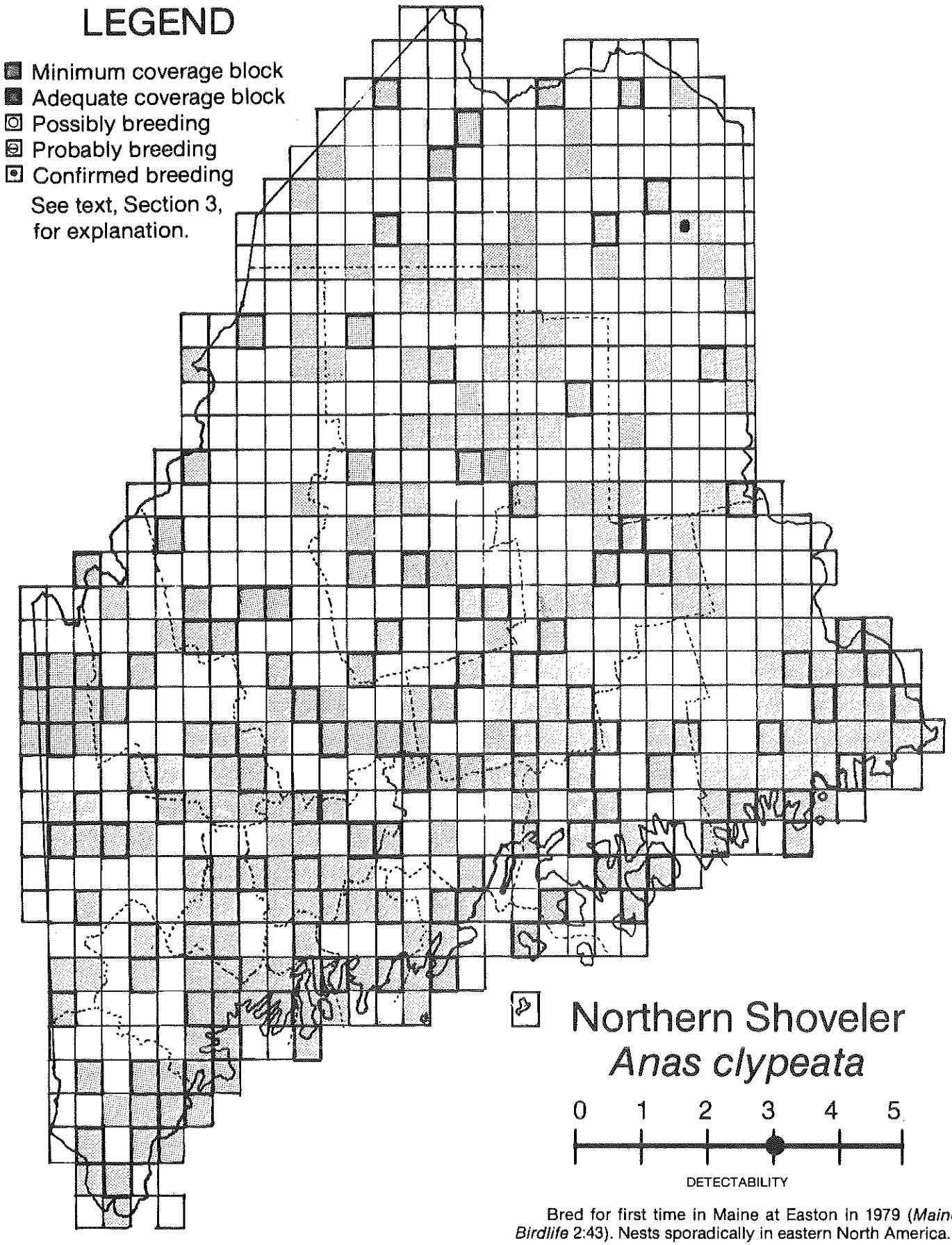
Approaches southern limit of its breeding range.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Mallard
Anas platyrhynchos
0 1 2 3 4 5
DETECTABILITY
Includes MDIFW data. See Coulter (1953).

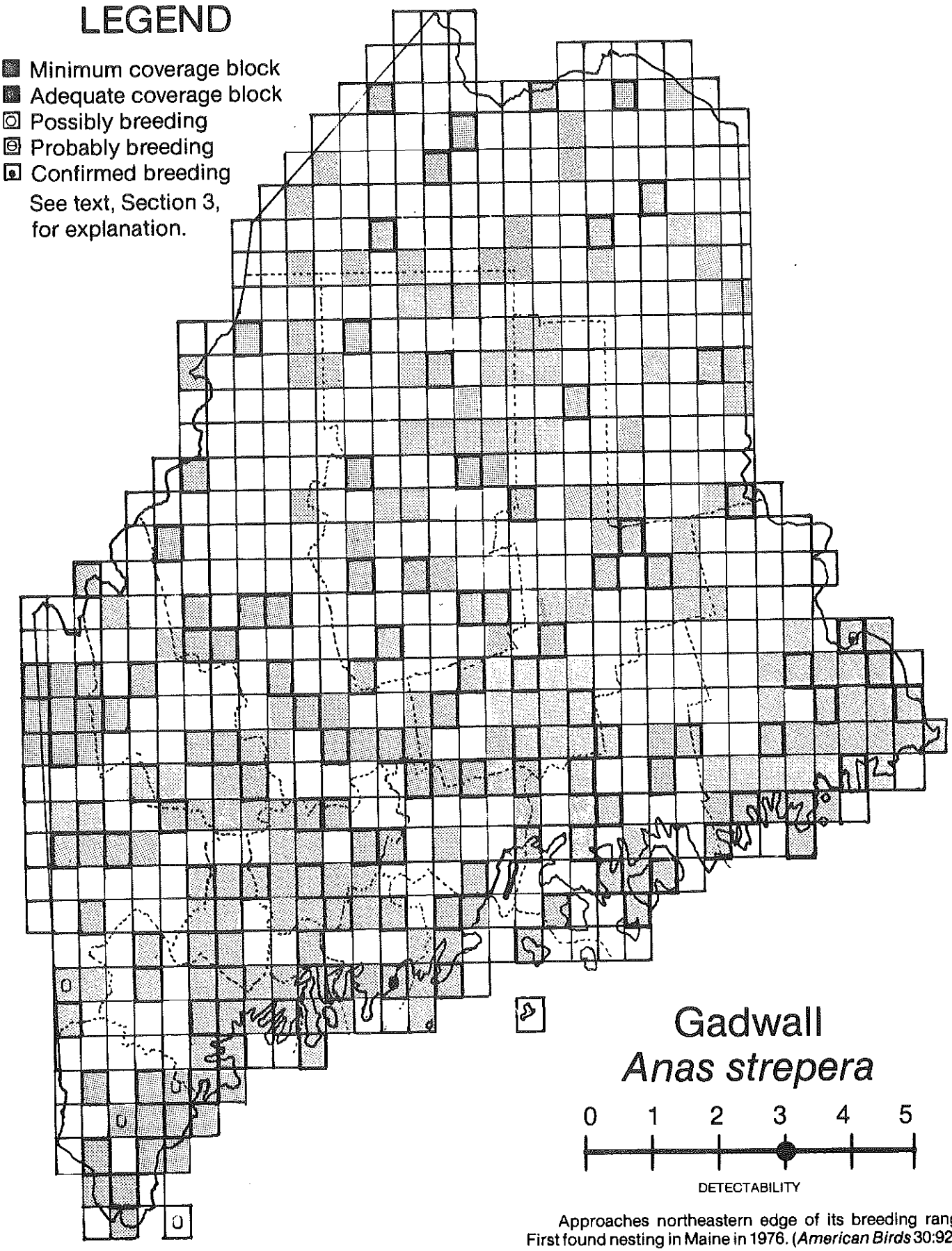


Map includes MDIFW data. See also Mendall (1949), Coulter (1955), Hartman (1960, 1963), Coulter and Miller (1968), Reinecke (1977, 1979), Wooley and Owen (1978), Ringleman (1980), Albright (1981), Reinecke *et al.* (1982), Ringleman and Longcore (1982a, b), and Ringleman *et al.* (1982a, b).

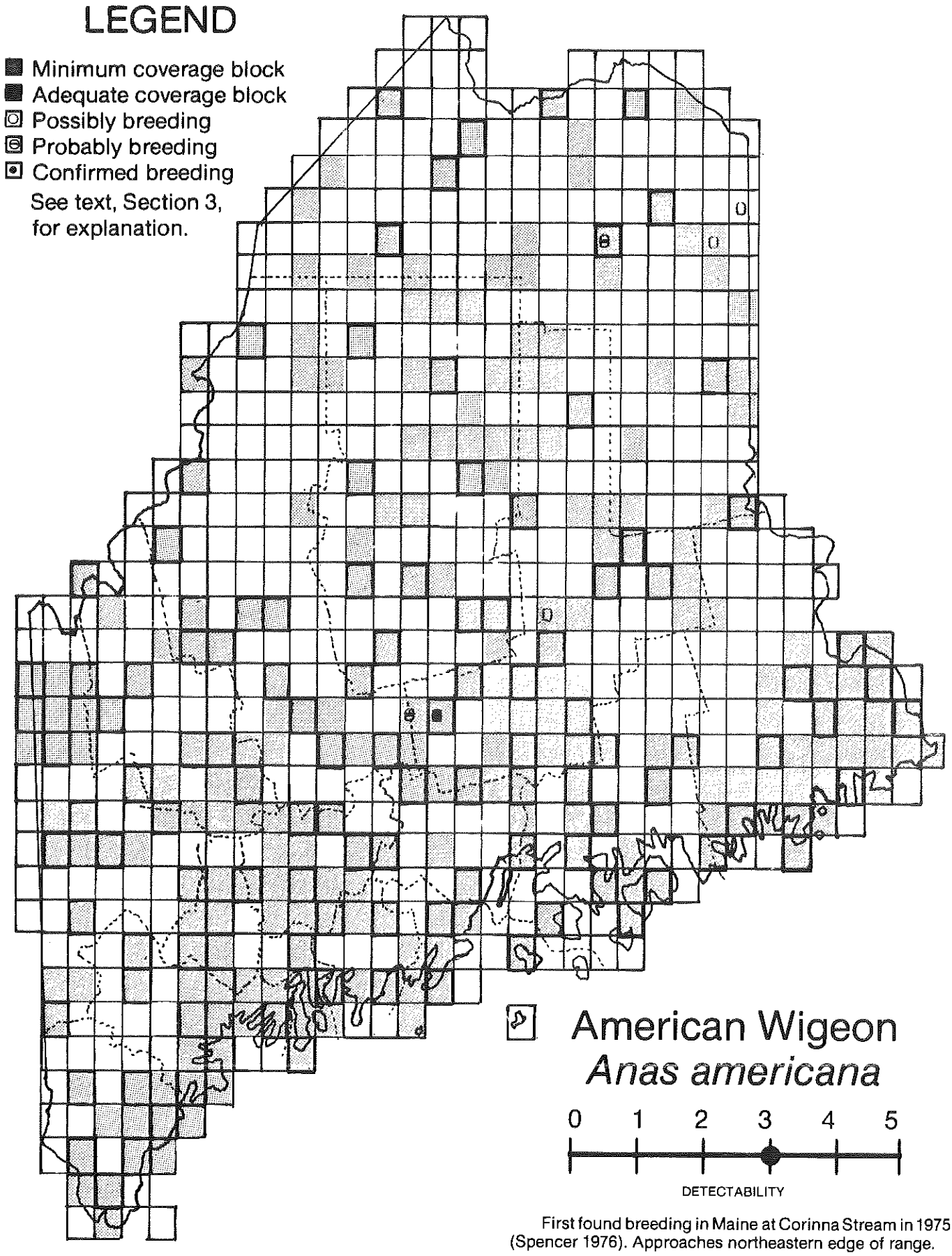

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Blue-winged Teal
Anas discors
0 1 2 3 4 5
DETECTABILITY
Map includes MDIFW data.



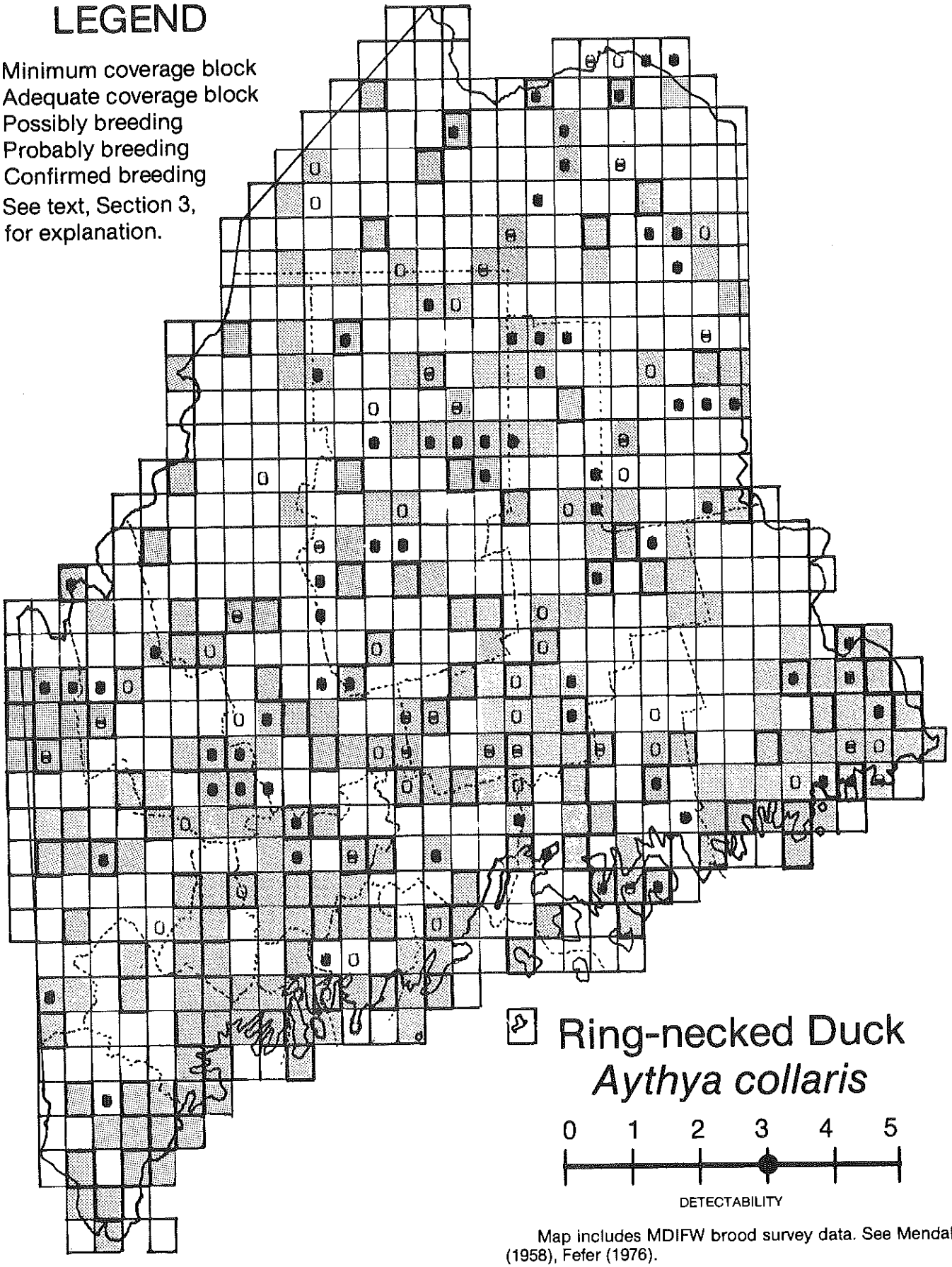
Bred for first time in Maine at Easton in 1979 (*Maine Birdlife* 2:43). Nests sporadically in eastern North America.



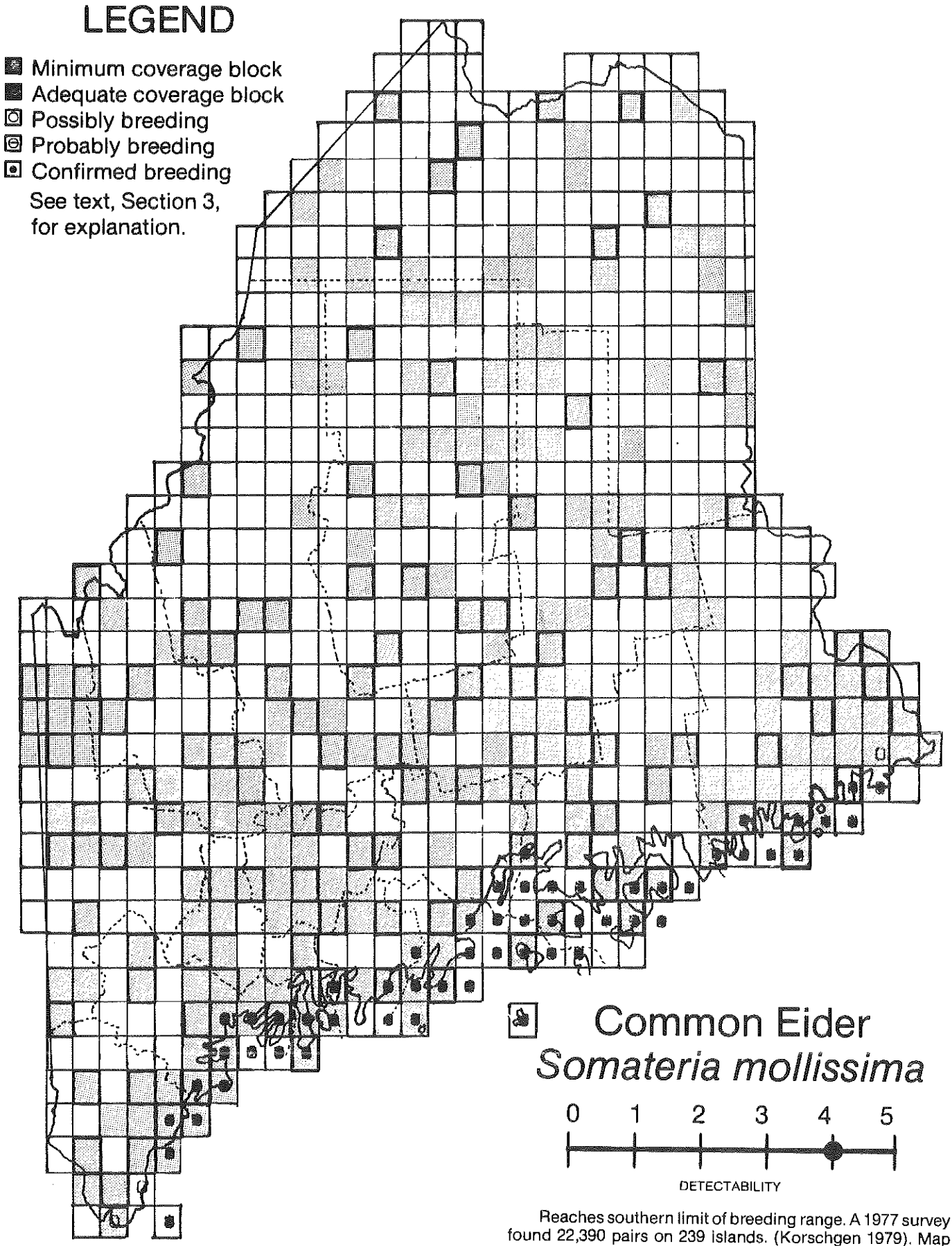
Approaches northeastern edge of its breeding range. First found nesting in Maine in 1976. (*American Birds* 30:928).



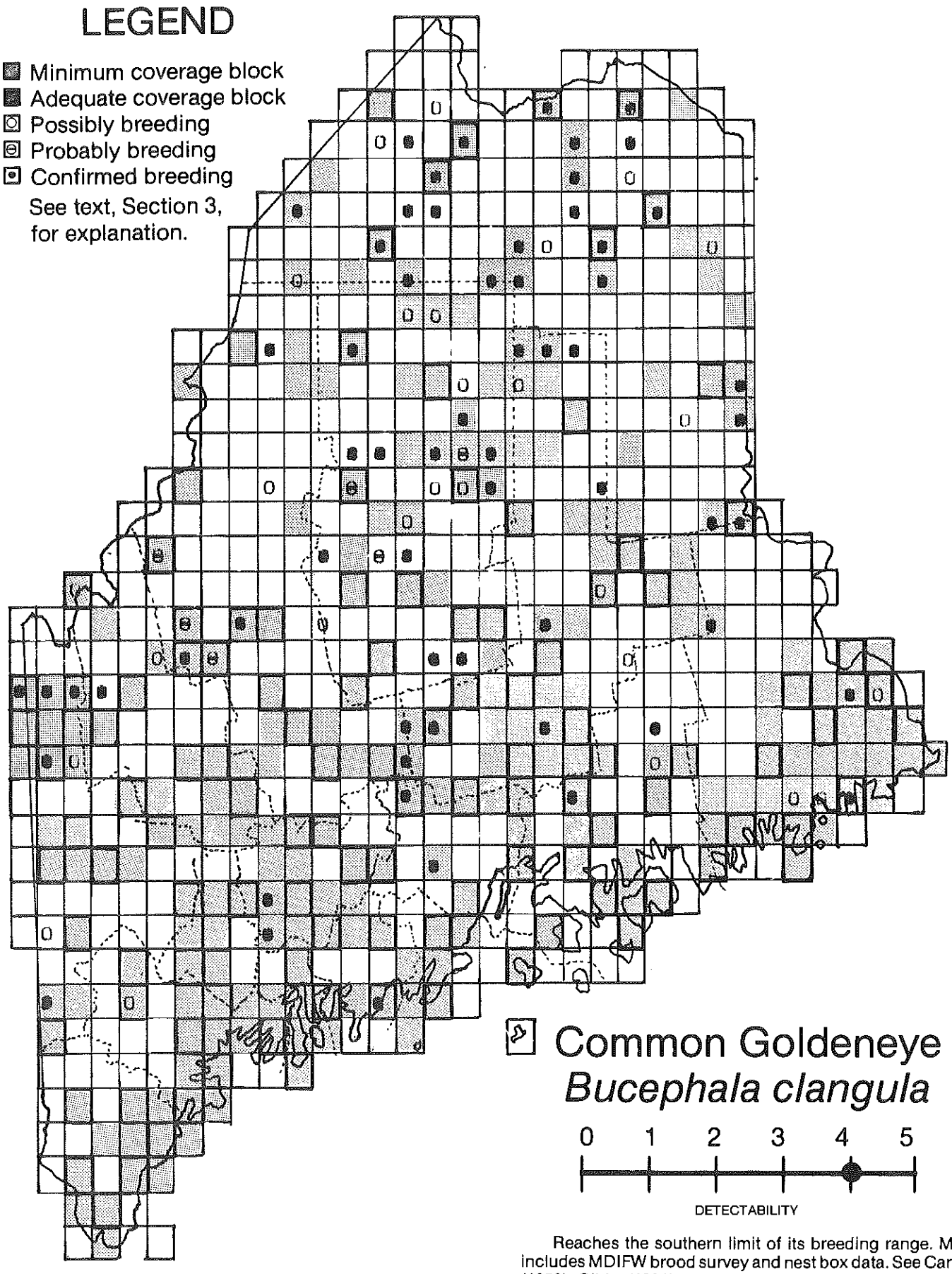
First found breeding in Maine at Corinna Stream in 1975. (Spencer 1976). Approaches northeastern edge of range.



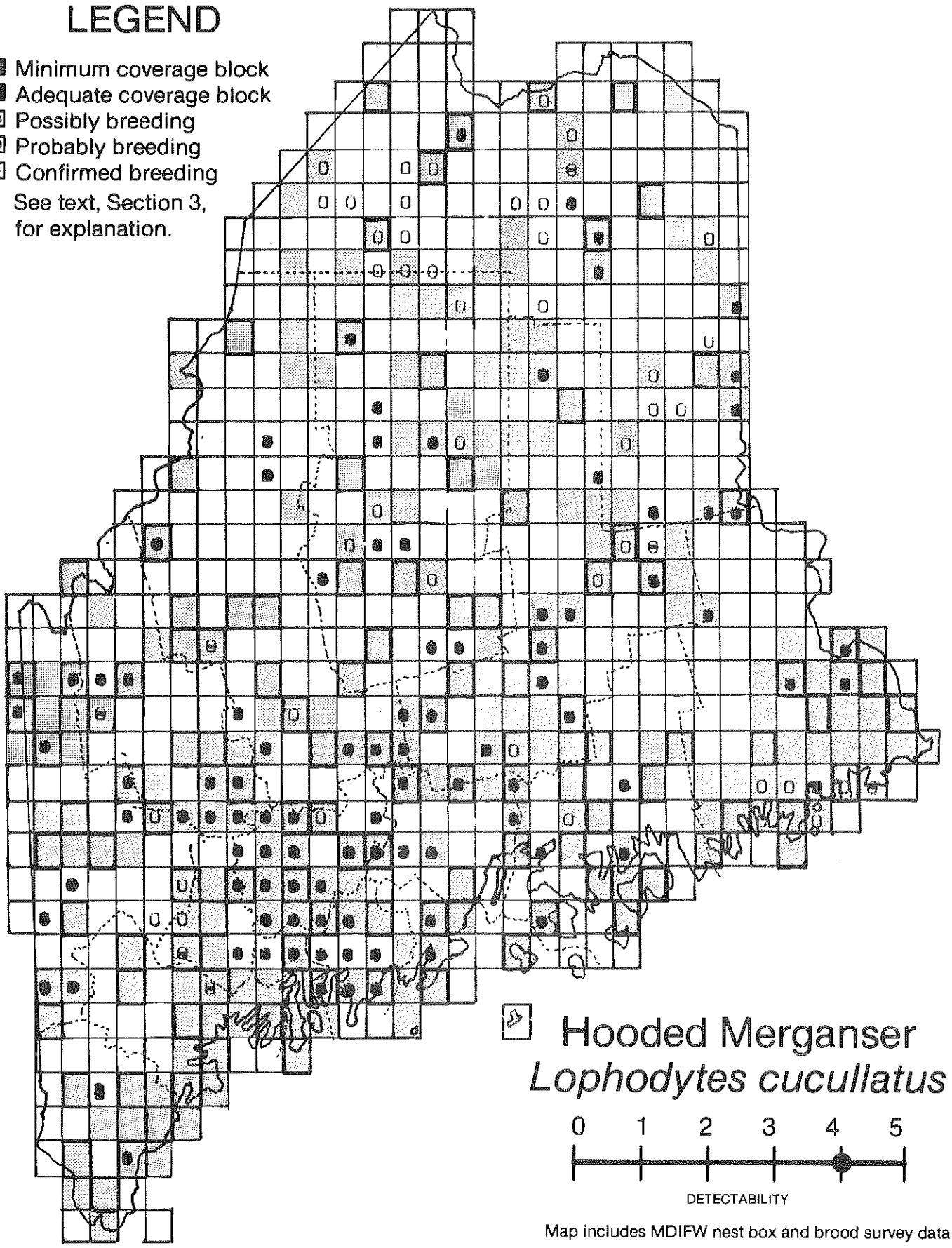
Map includes MDIFW brood survey data. See Mendall (1958), Fefer (1976).



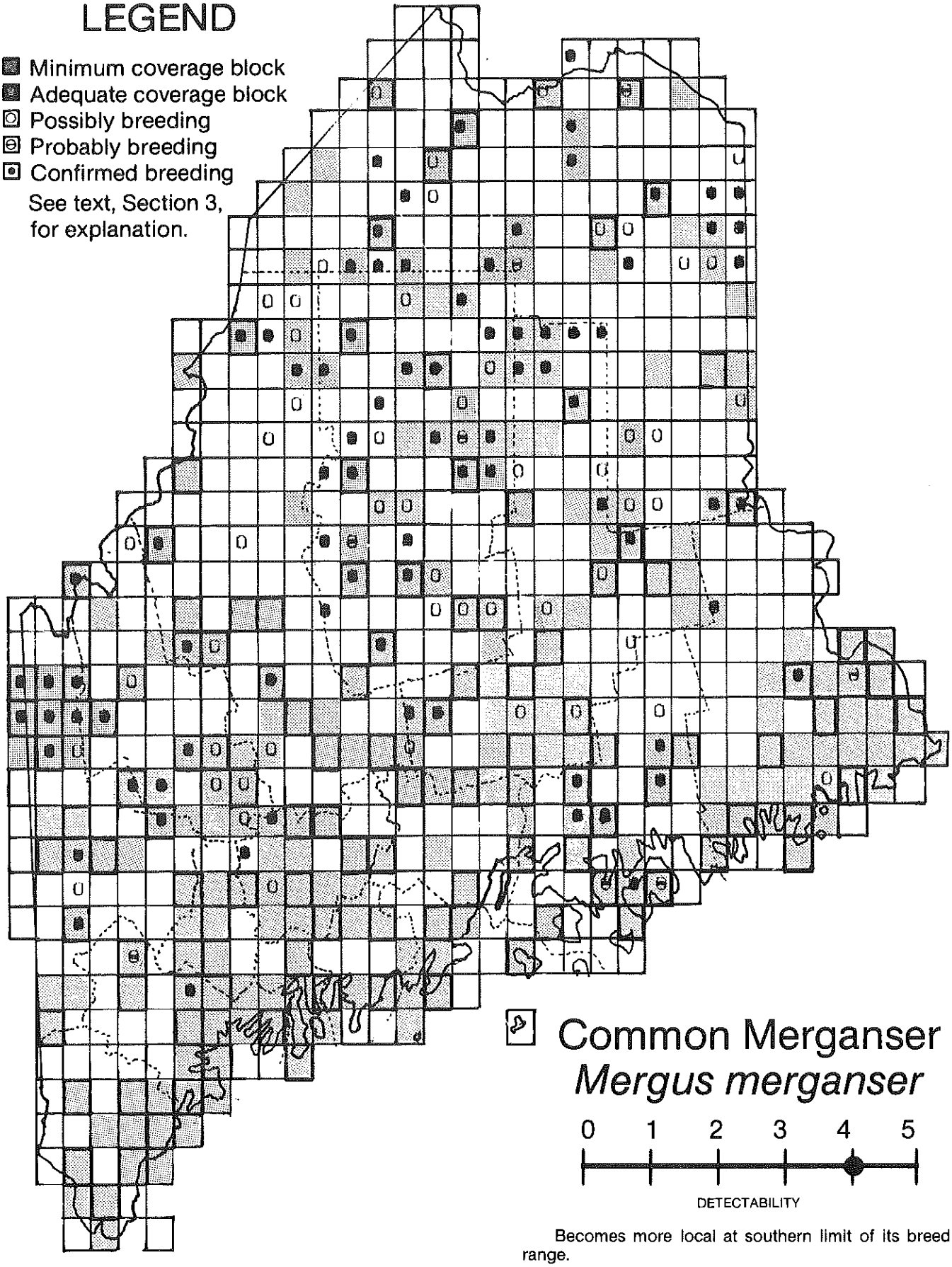
Reaches southern limit of breeding range. A 1977 survey found 22,390 pairs on 239 islands. (Korschgen 1979). Map includes MDIFW and USFWS data. See also Choate (1966), McLaughlin (1967), Clark (1968), Bourget (1972, 1973), Sarbello (1973), Wakeley (1973), Clark *et al.* (1974), Korschgen (1976), Minot (1976), Wakeley and Mendall (1976), Mendall (1980).



Reaches the southern limit of its breeding range. Map includes MDIFW brood survey and nest box data. See Carter (1952), Gibbs (1981).

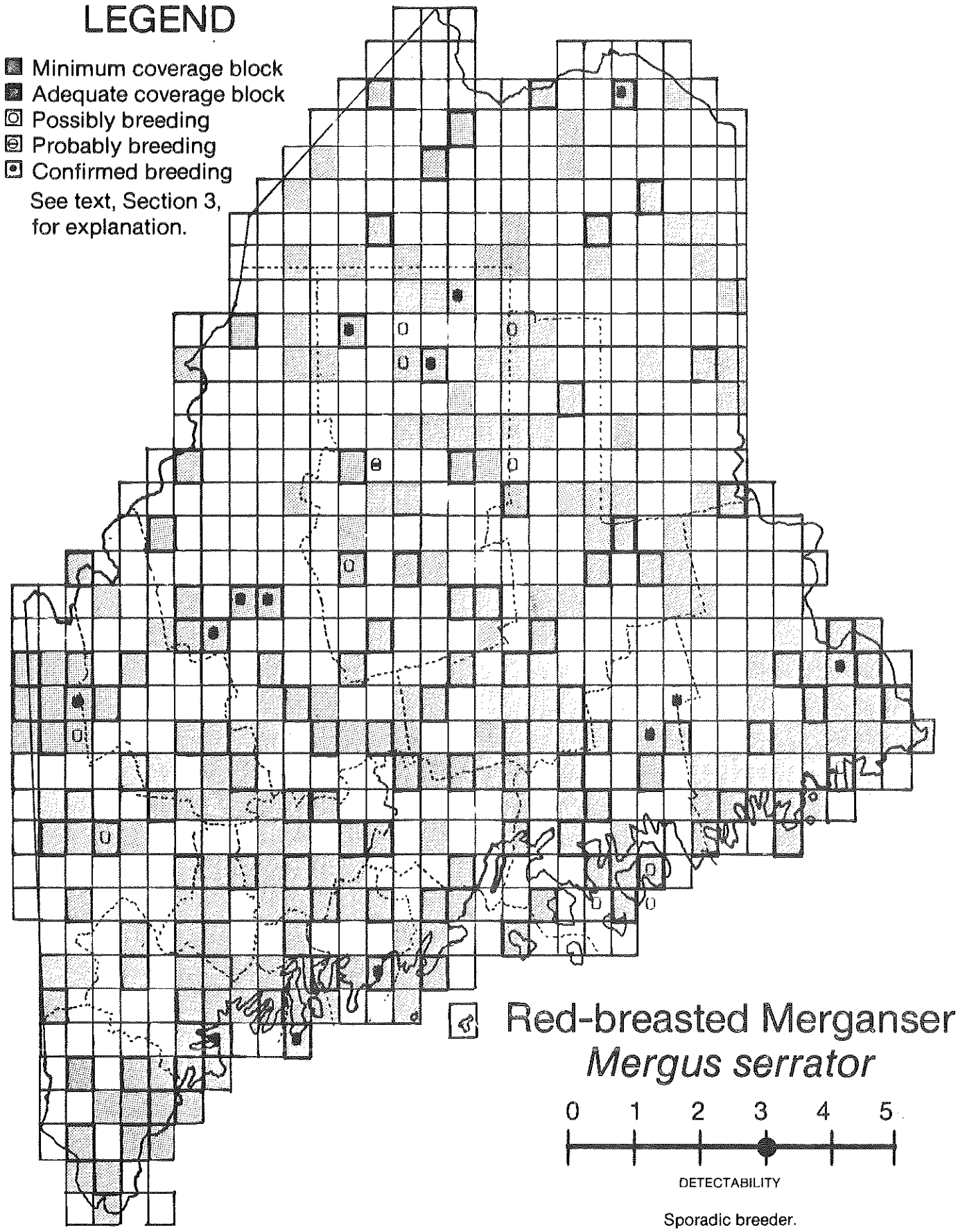


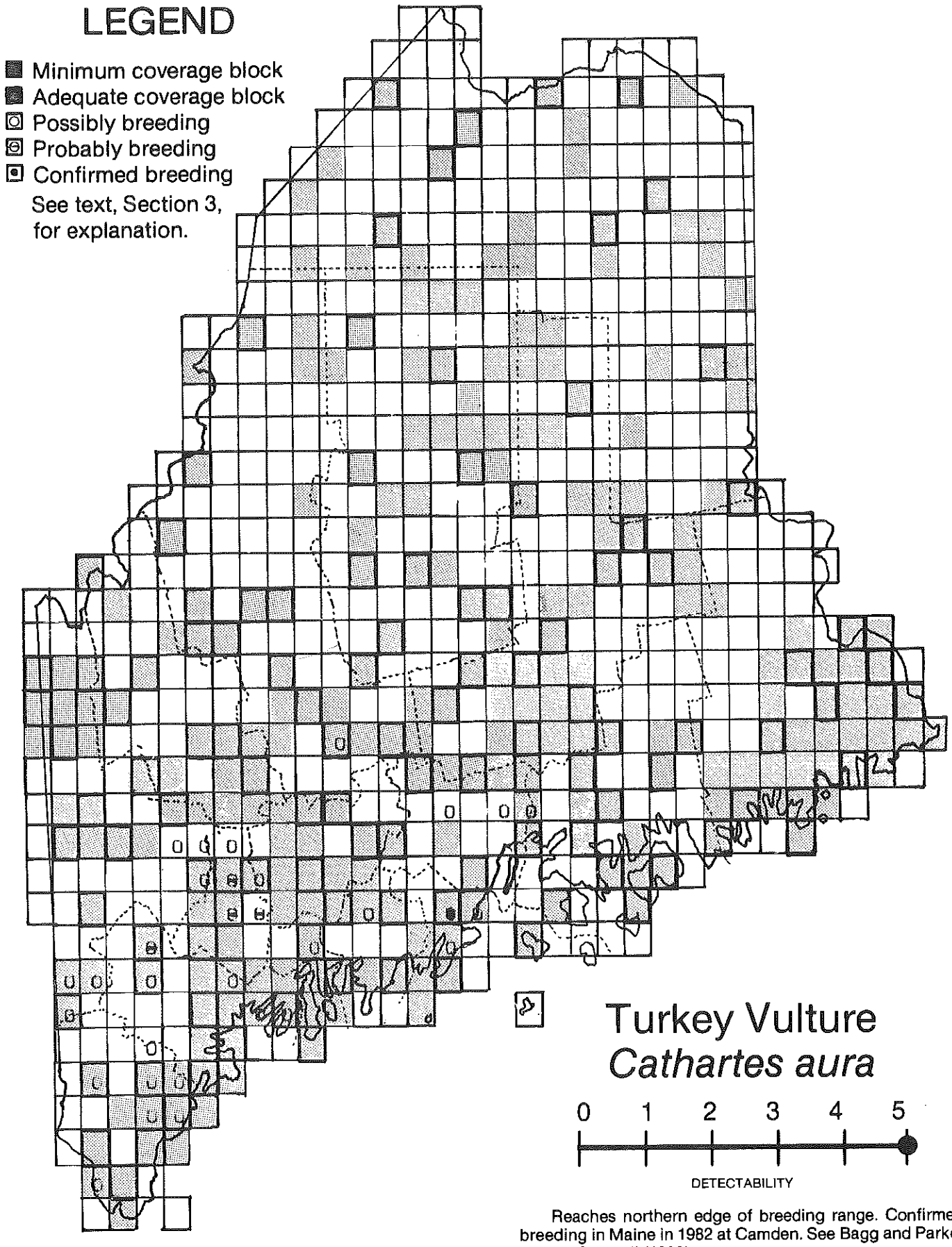
Map includes MDIFW nest box and brood survey data.



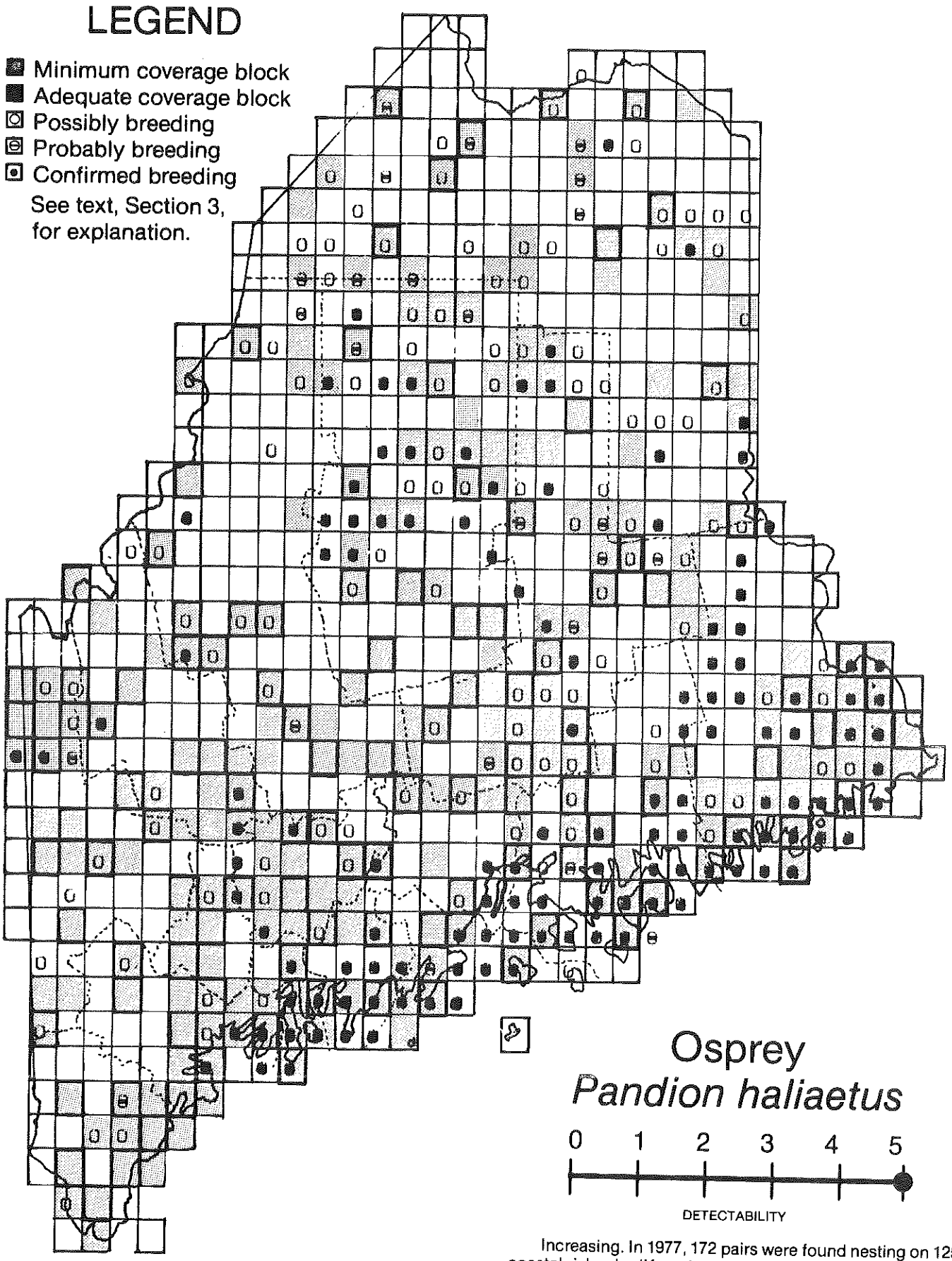
Common Merganser
Mergus merganser

Becomes more local at southern limit of its breeding range.

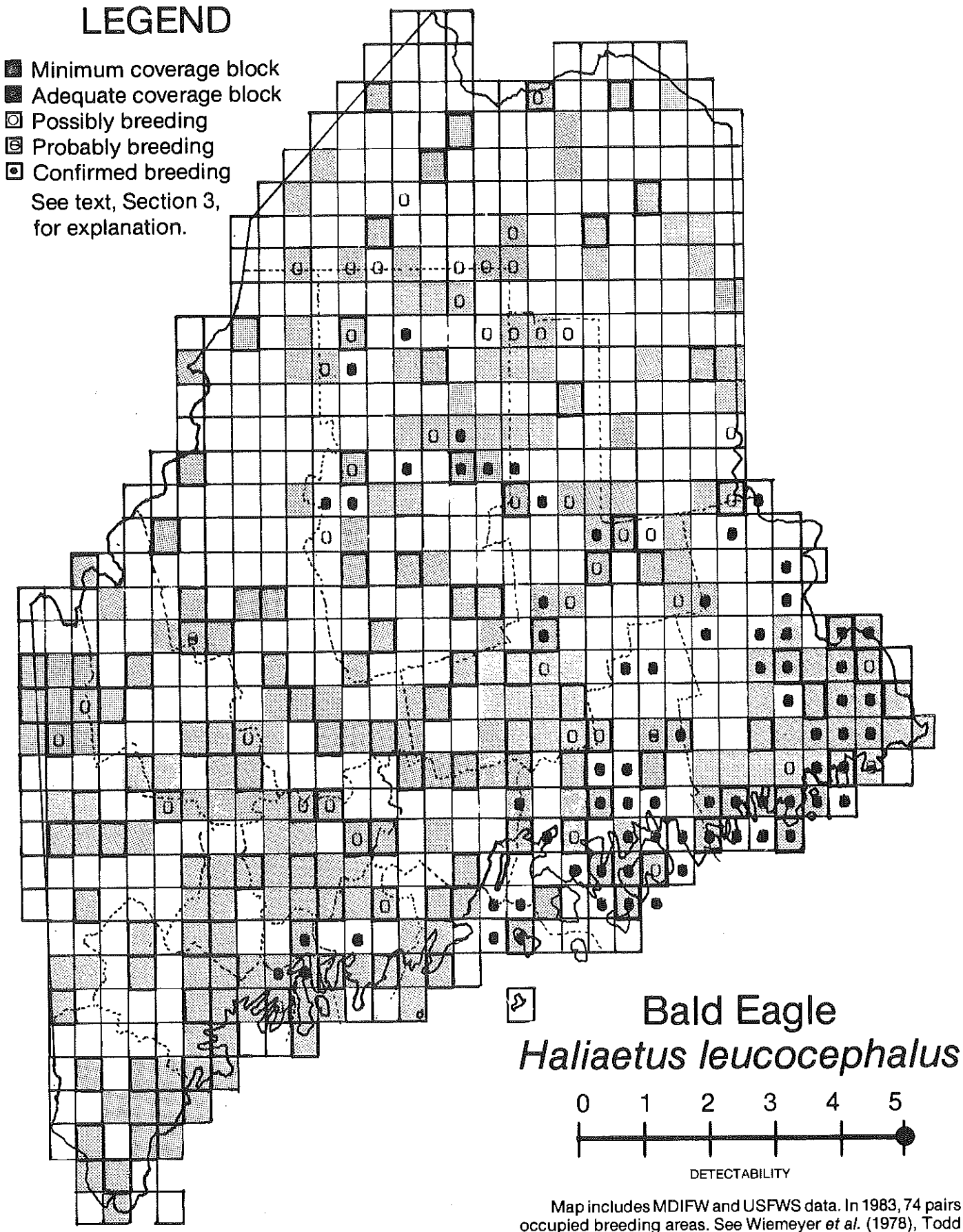

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Red-breasted Merganser
Mergus serrator
0 1 2 3 4 5
DETECTABILITY
Sporadic breeder.



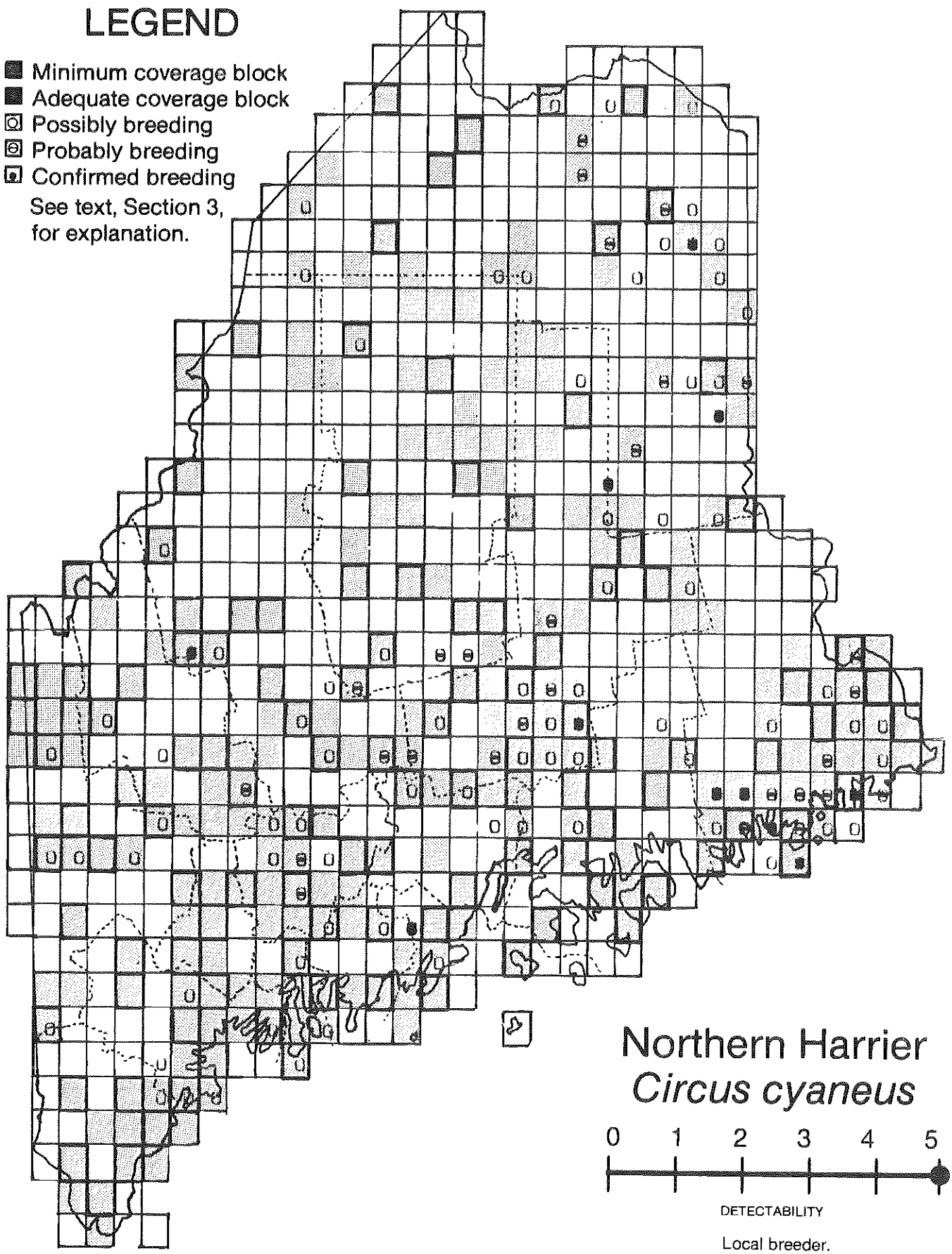
Reaches northern edge of breeding range. Confirmed breeding in Maine in 1982 at Camden. See Bagg and Parker (1951), Getchell (1982).

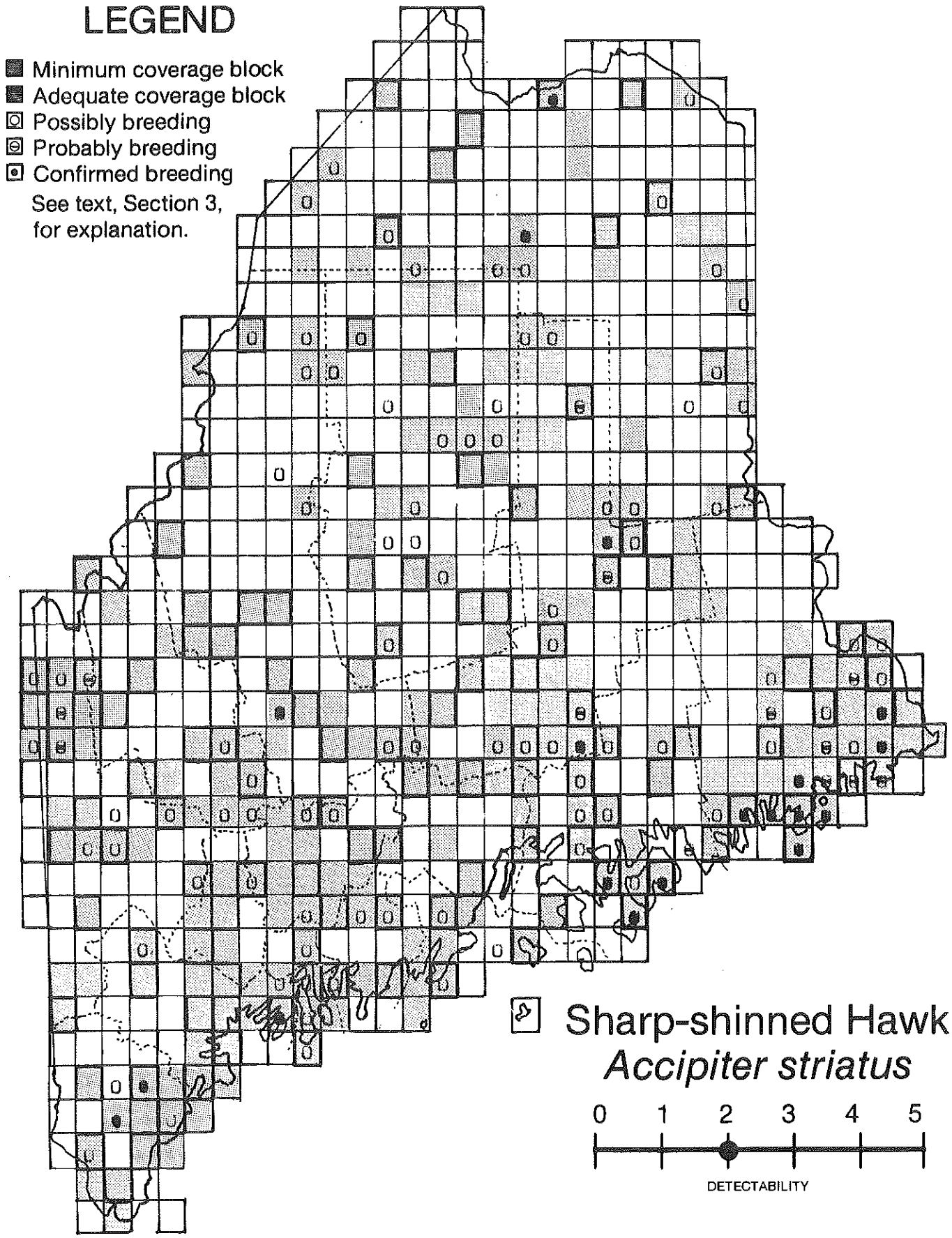


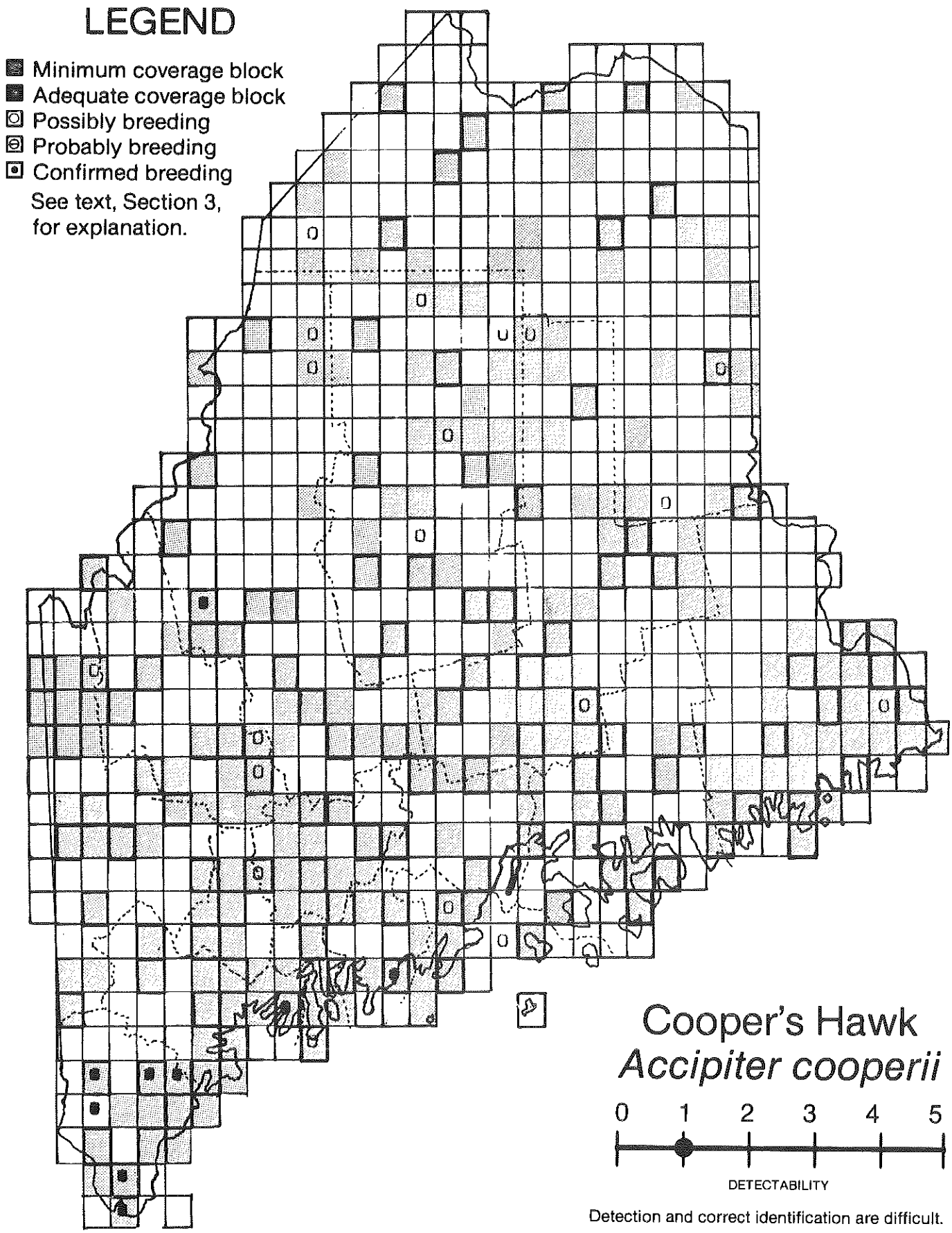
Increasing. In 1977, 172 pairs were found nesting on 125 coastal islands (Korschgen 1979). Over 500 pairs nest throughout the state (MDIFW-USFWS data).

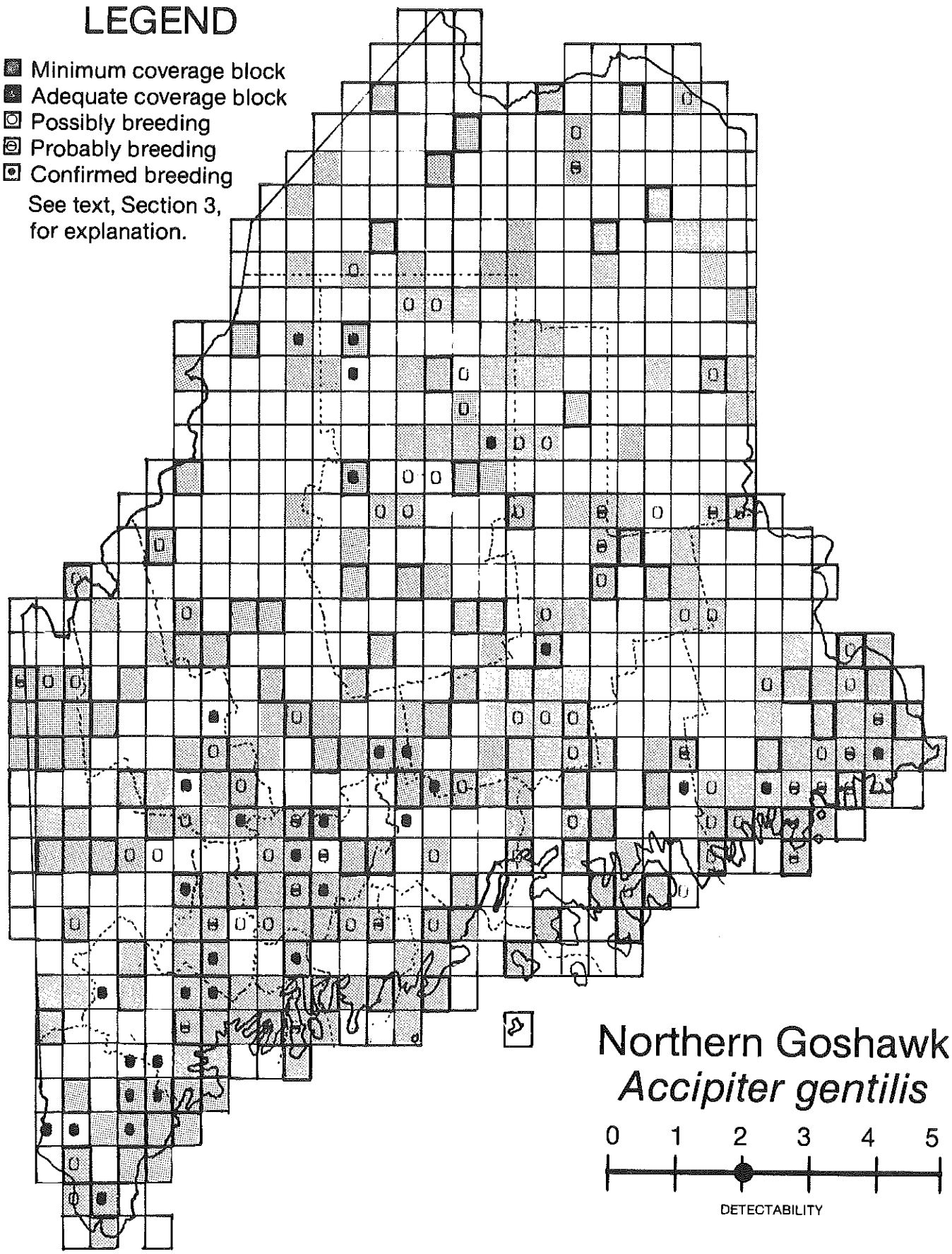


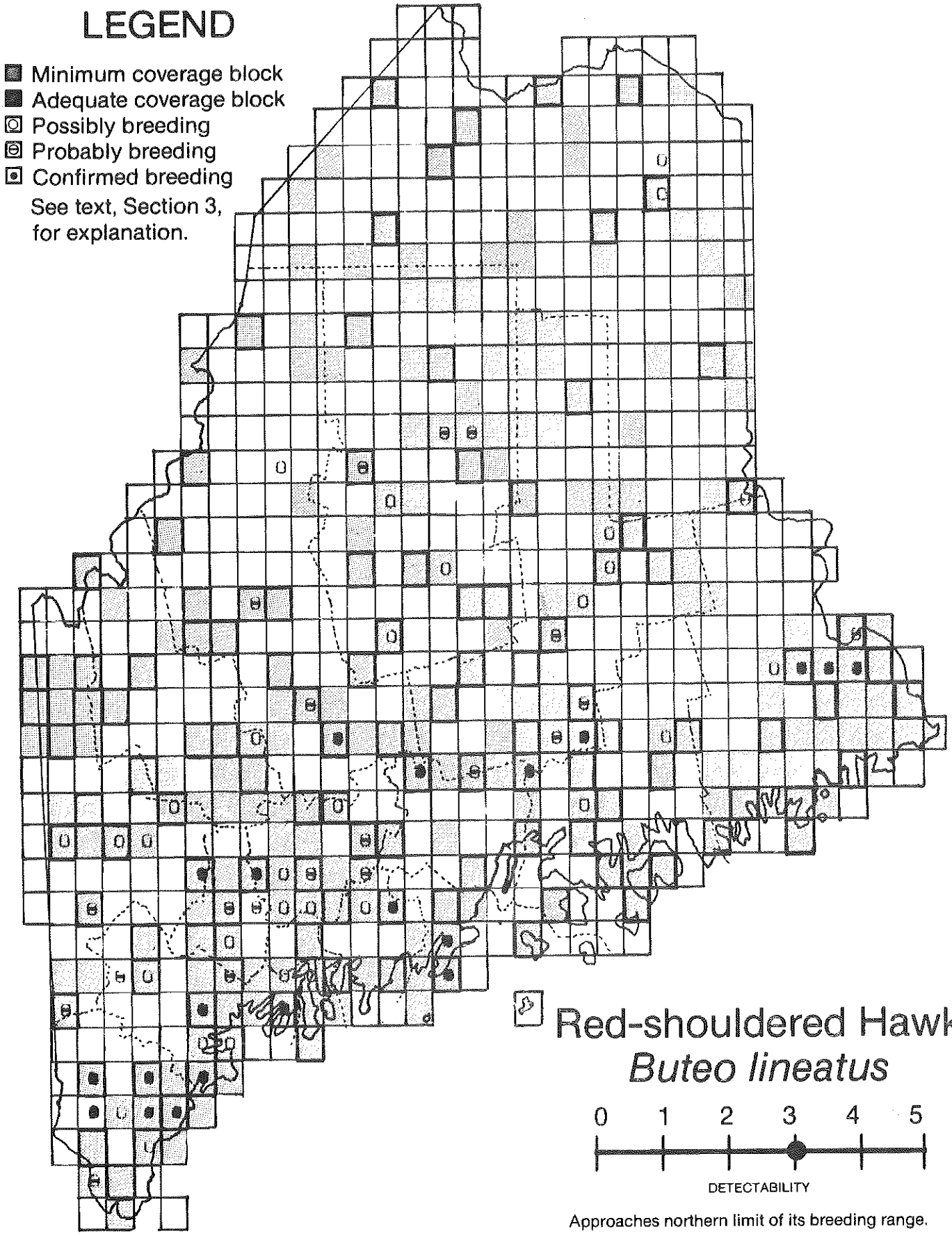
Map includes MDIFW and USFWS data. In 1983, 74 pairs occupied breeding areas. See Wiemeyer *et al.* (1978), Todd and Owen (1979), Todd (1979, 1981), and Todd *et al.* (1982).


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Northern Harrier
Circus cyaneus
0 1 2 3 4 5
DETECTABILITY
Local breeder.

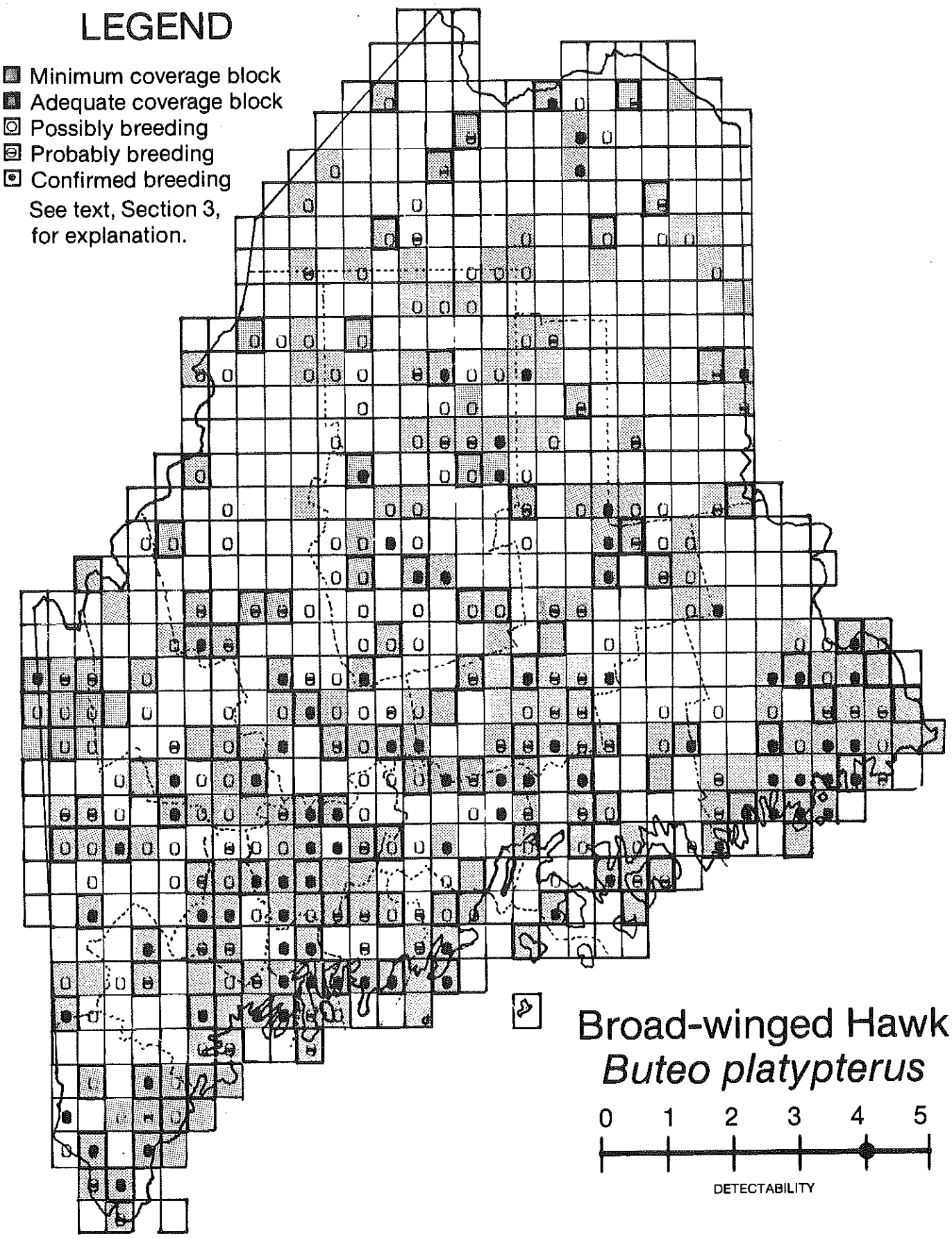

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Sharp-shinned Hawk
Accipiter striatus
0 1 2 3 4 5
DETECTABILITY

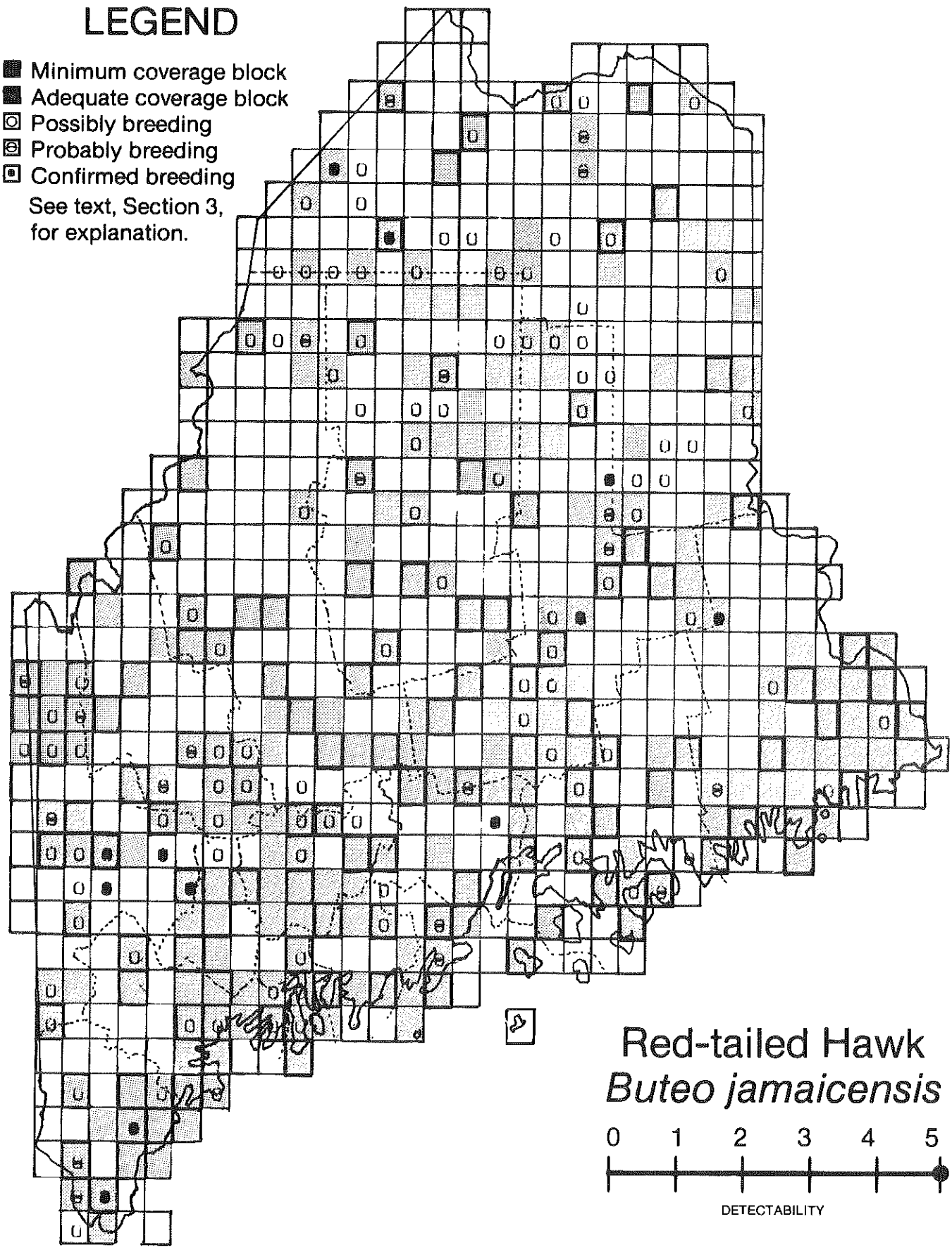

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Cooper's Hawk
Accipiter cooperii
0 1 2 3 4 5
DETECTABILITY
Detection and correct identification are difficult.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Northern Goshawk
Accipiter gentilis
0 1 2 3 4 5
DETECTABILITY



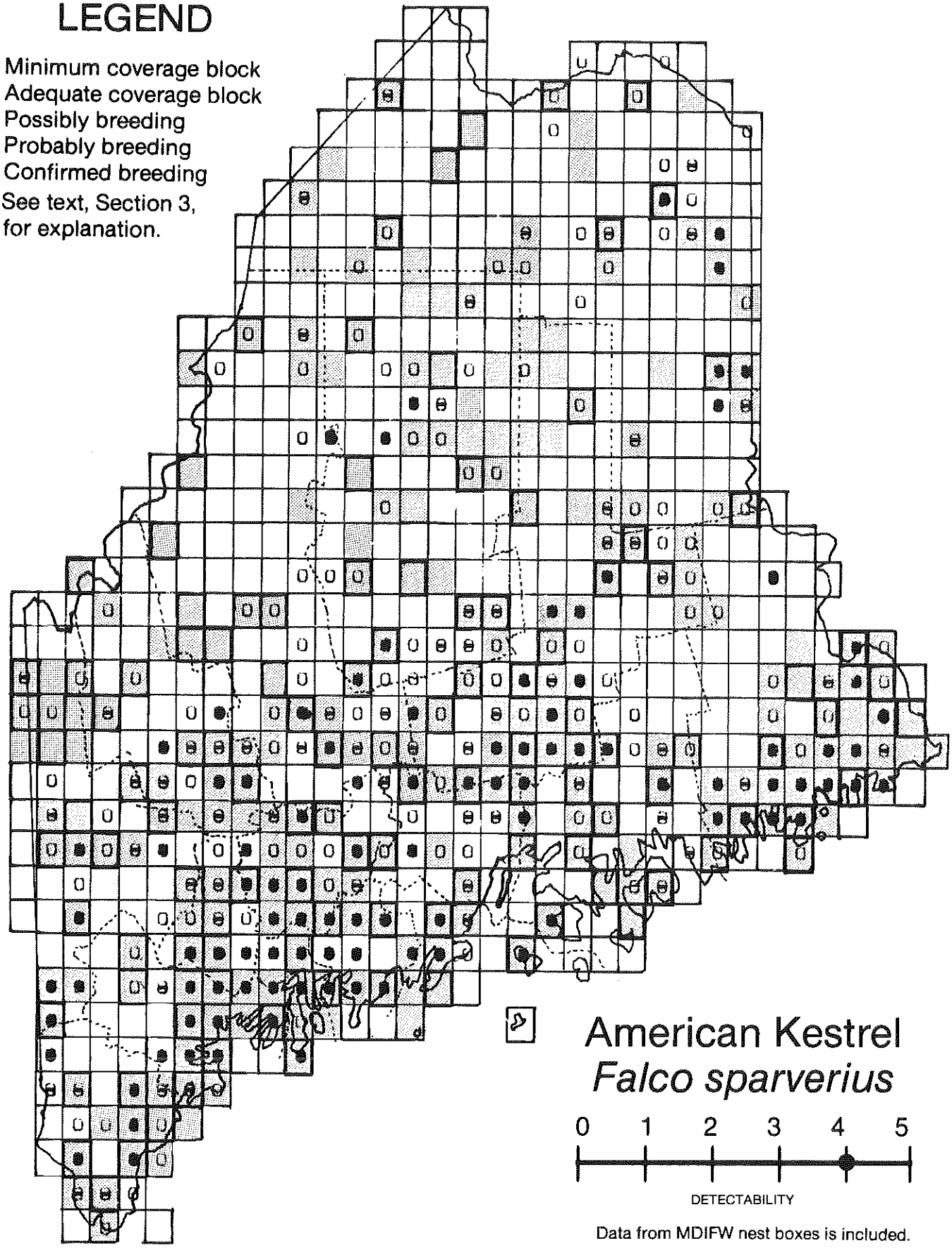
Approaches northern limit of its breeding range.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Broad-winged Hawk
Buteo platypterus
0 1 2 3 4 5
DETECTABILITY


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Red-tailed Hawk
Buteo jamaicensis
0 1 2 3 4 5
DETECTABILITY

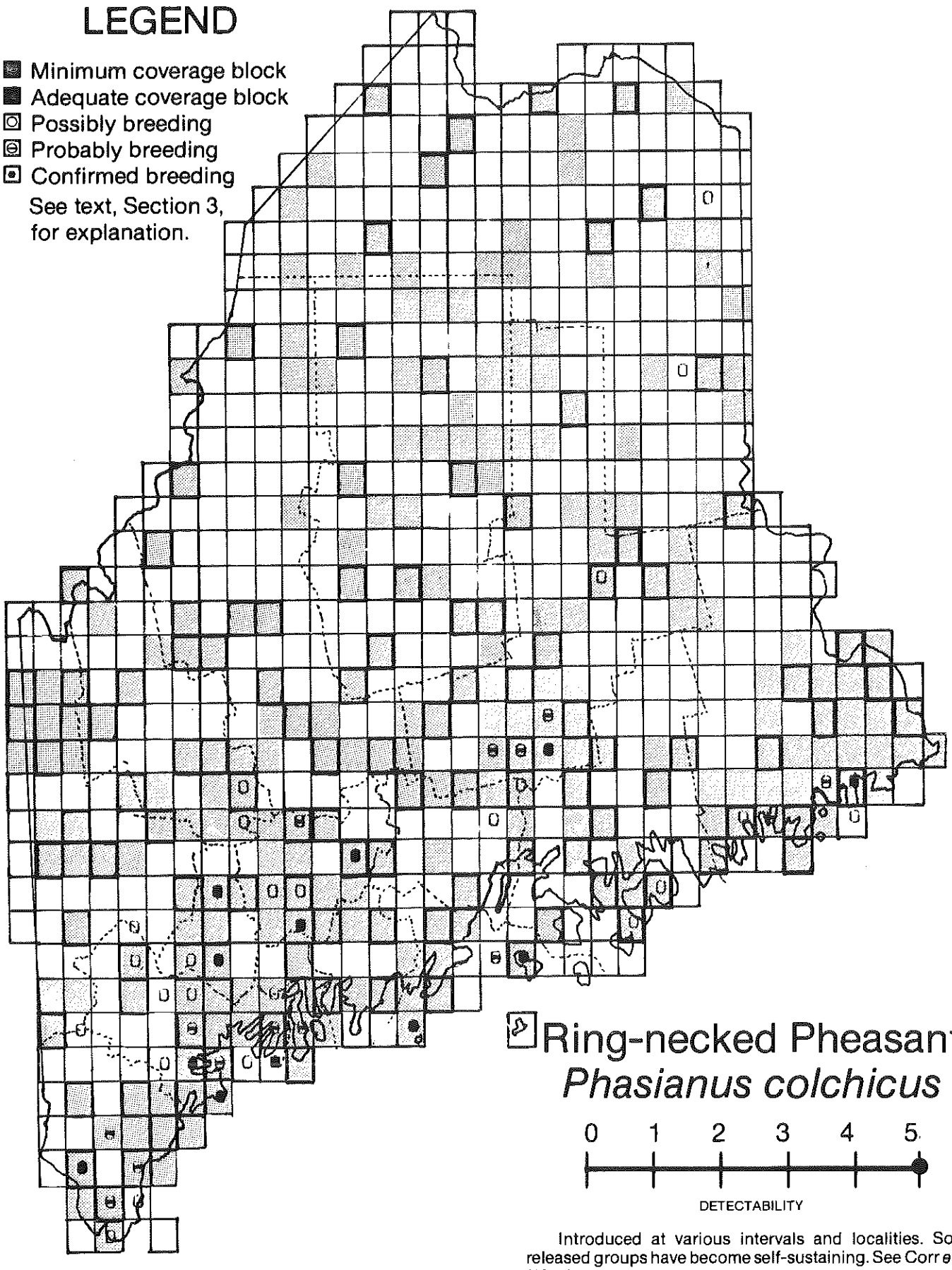
Golden Eagle
Aquila chrysaetos

A very few pairs continue to nest in northern Maine. Map withheld to protect confidentiality of breeding sites.

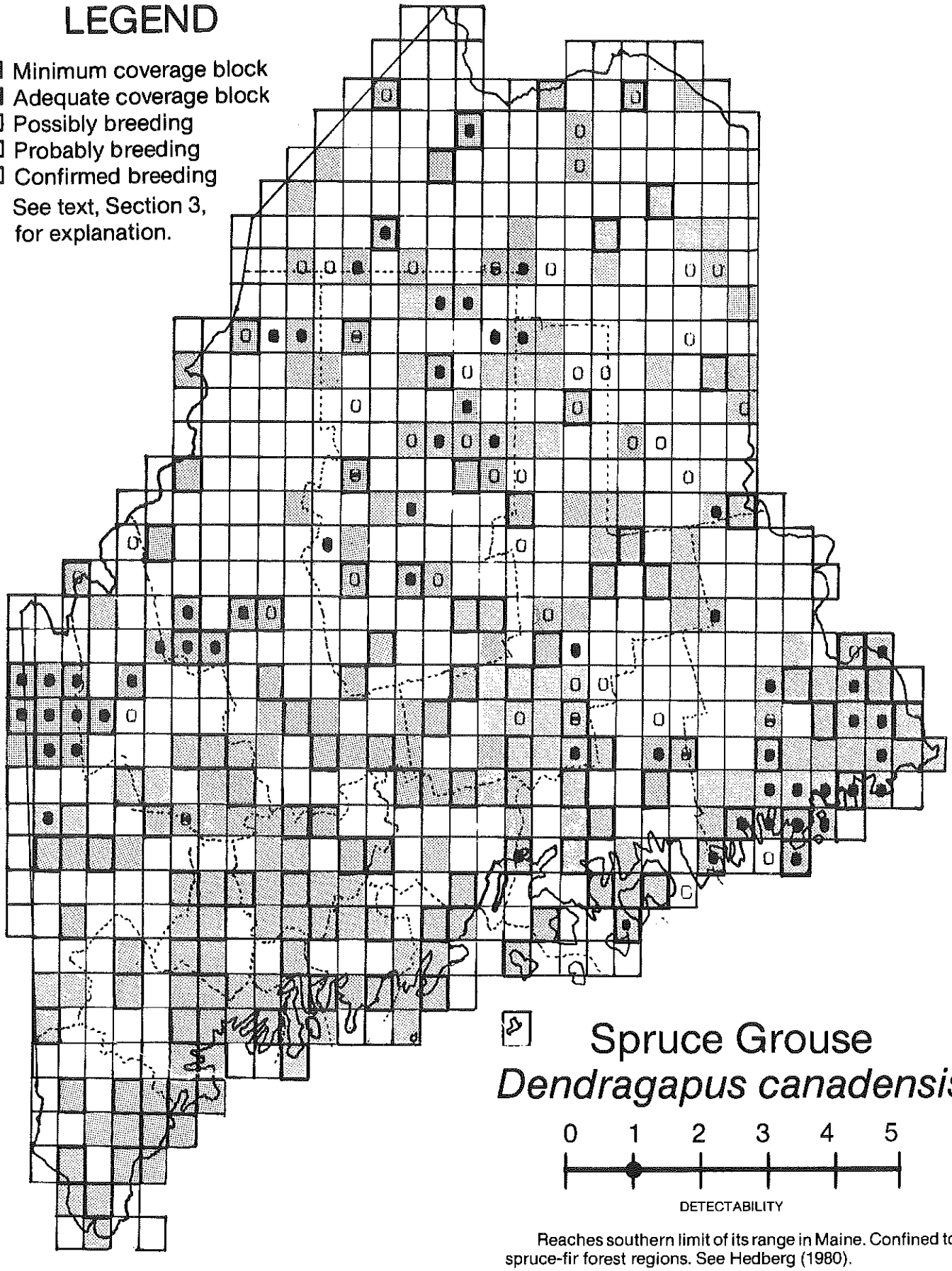

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
American Kestrel
Falco sparverius
0 1 2 3 4 5
DETECTABILITY
Data from MDIFW nest boxes is included.

Peregrine Falcon
Falco peregrinus

In 1980, a pair nested in eastern Maine, successfully fledging two young on August 20 (*American Birds* 34:875). Map withheld to protect confidentiality of breeding sites.



Introduced at various intervals and localities. Some released groups have become self-sustaining. See Corr *et al.* (1977).

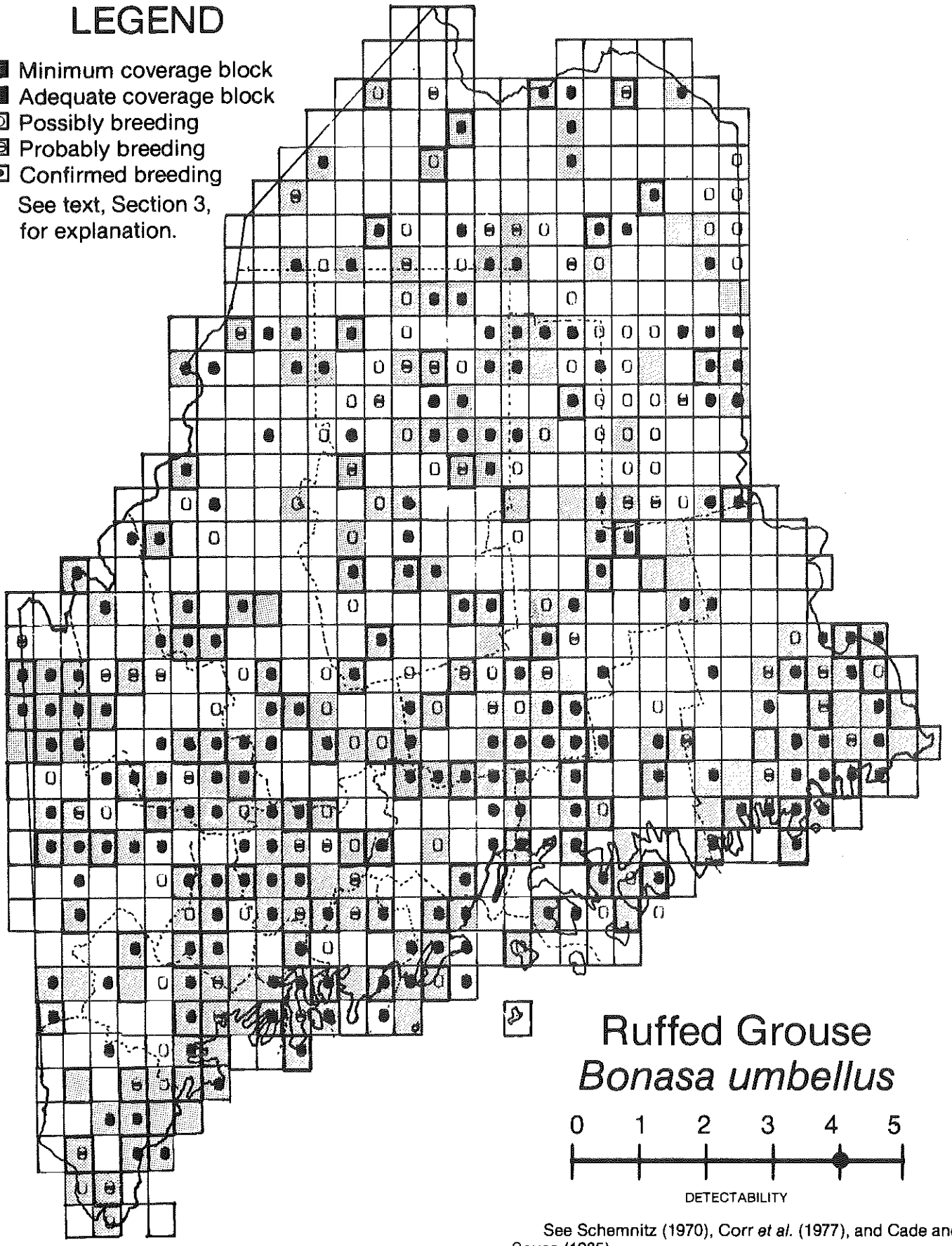


Spruce Grouse
Dendragapus canadensis

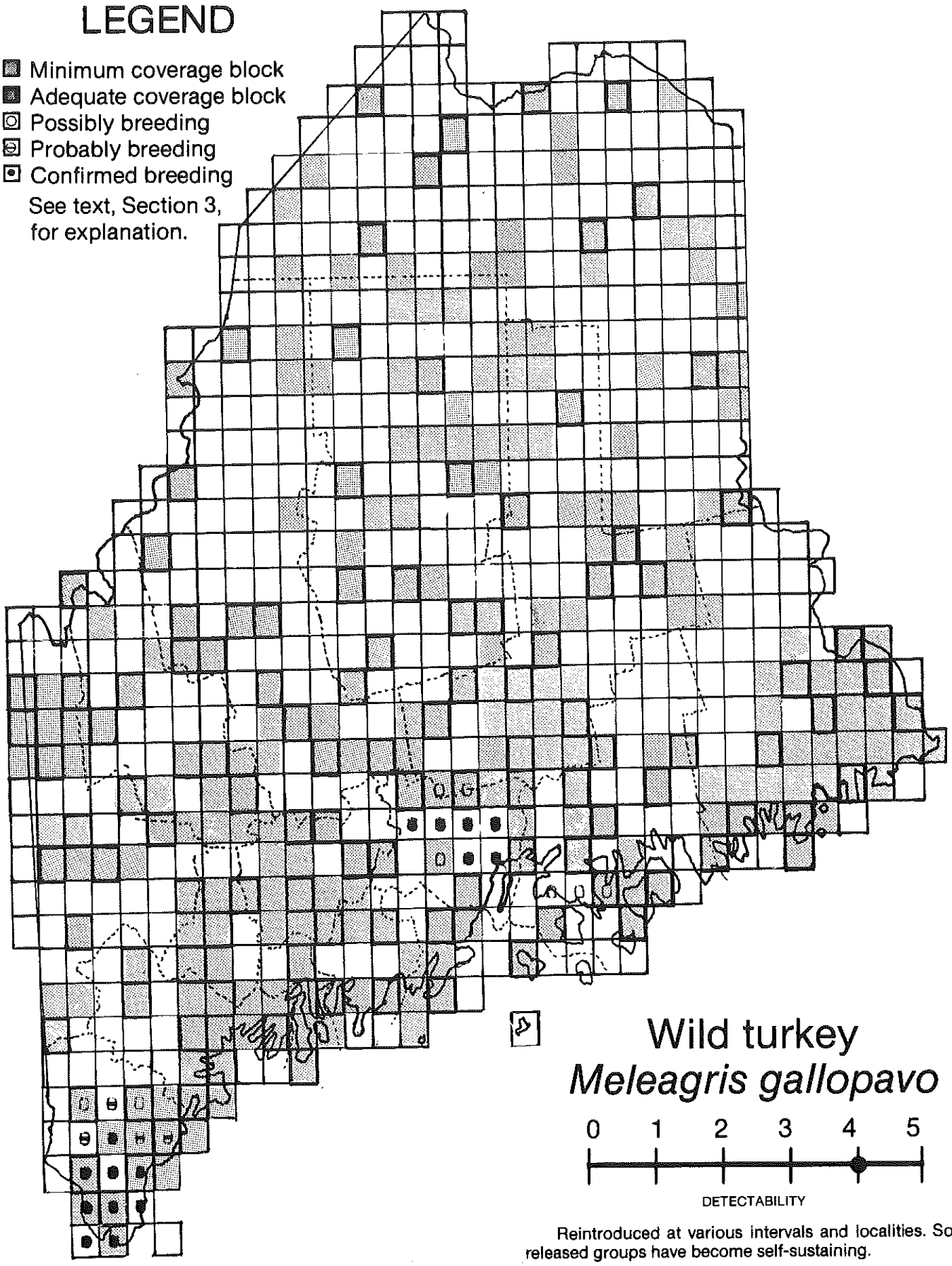
0 1 2 3 4 5

DETECTABILITY

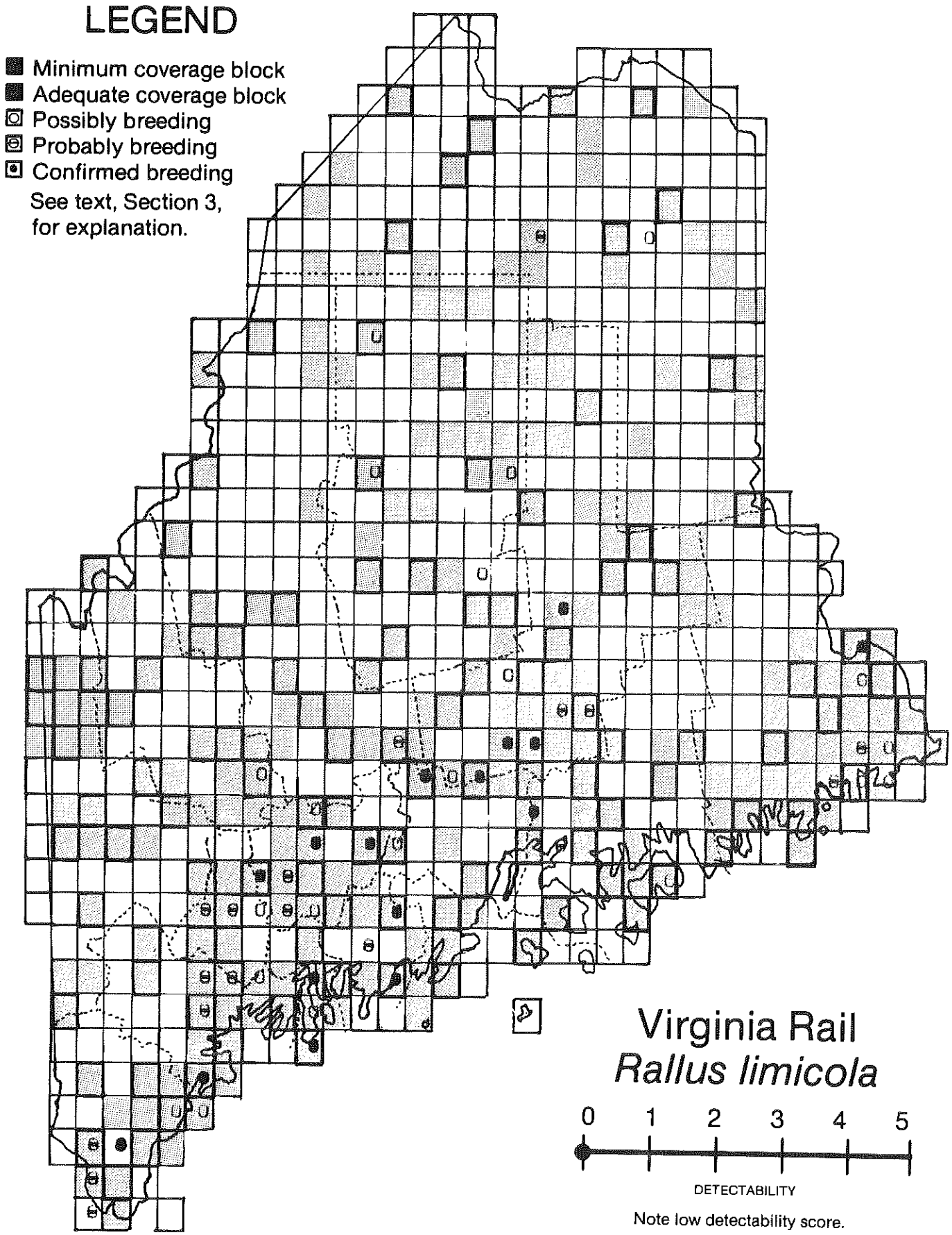
Reaches southern limit of its range in Maine. Confined to spruce-fir forest regions. See Hedberg (1980).

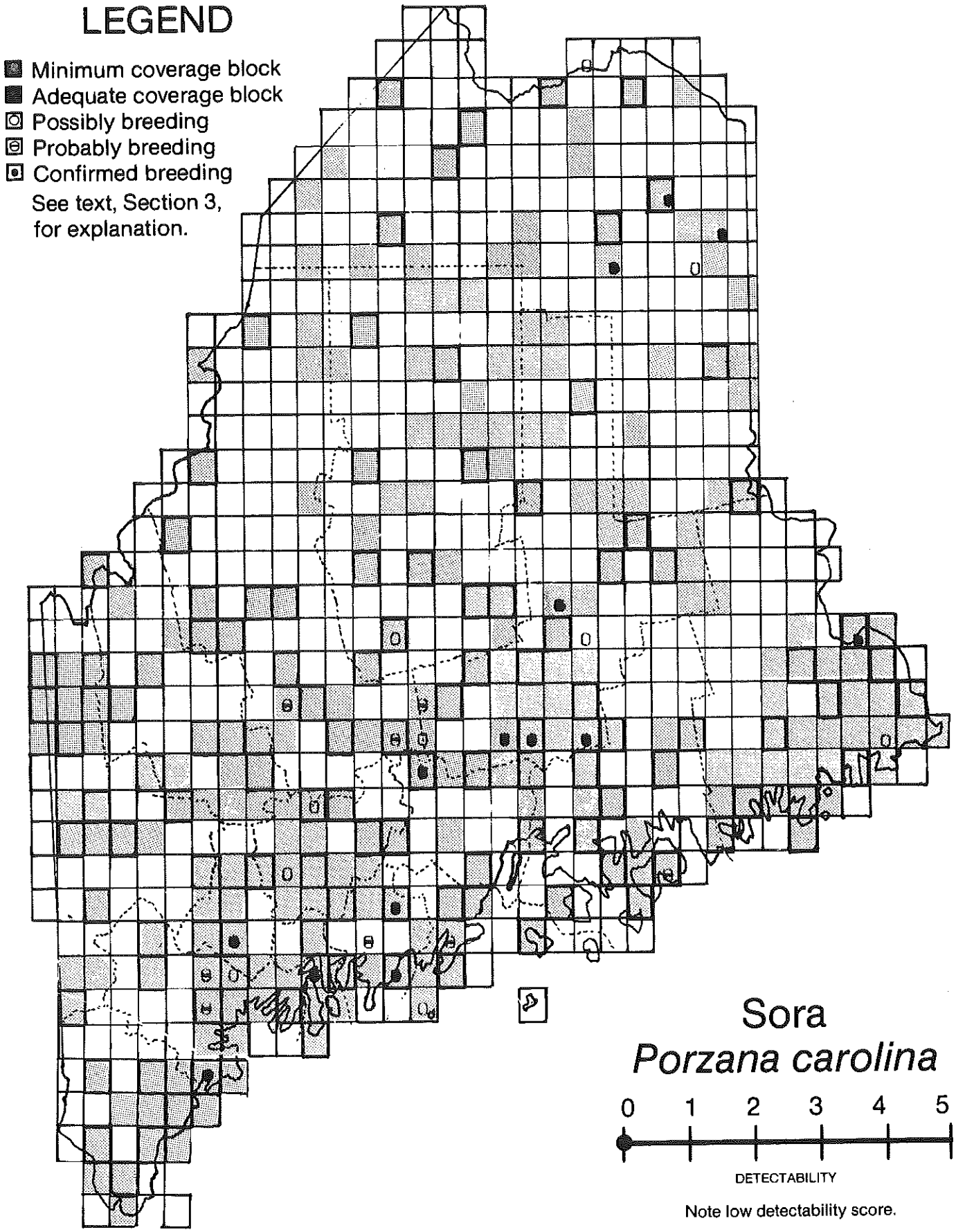


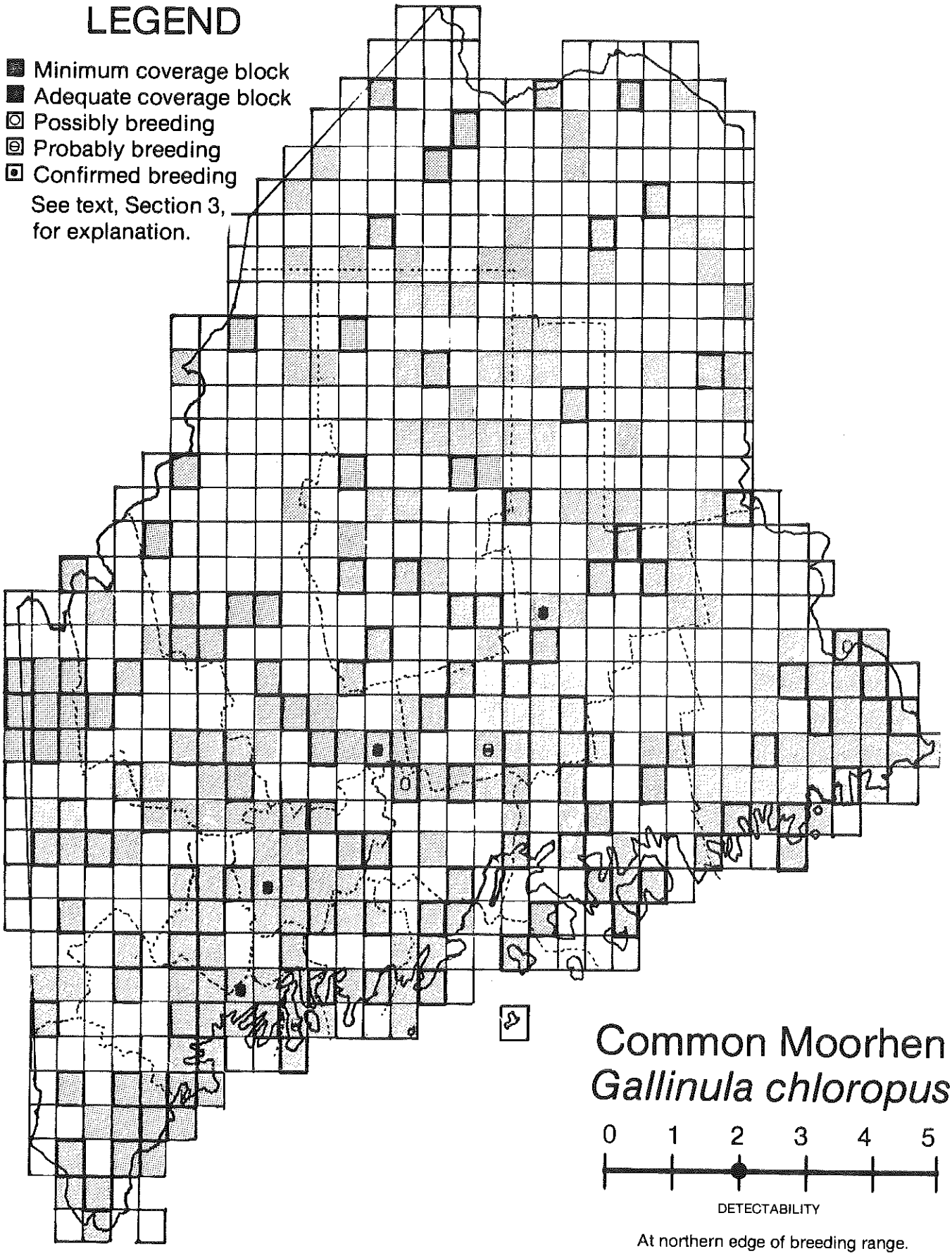
See Schemnitz (1970), Corr *et al.* (1977), and Cade and Sousa (1985).

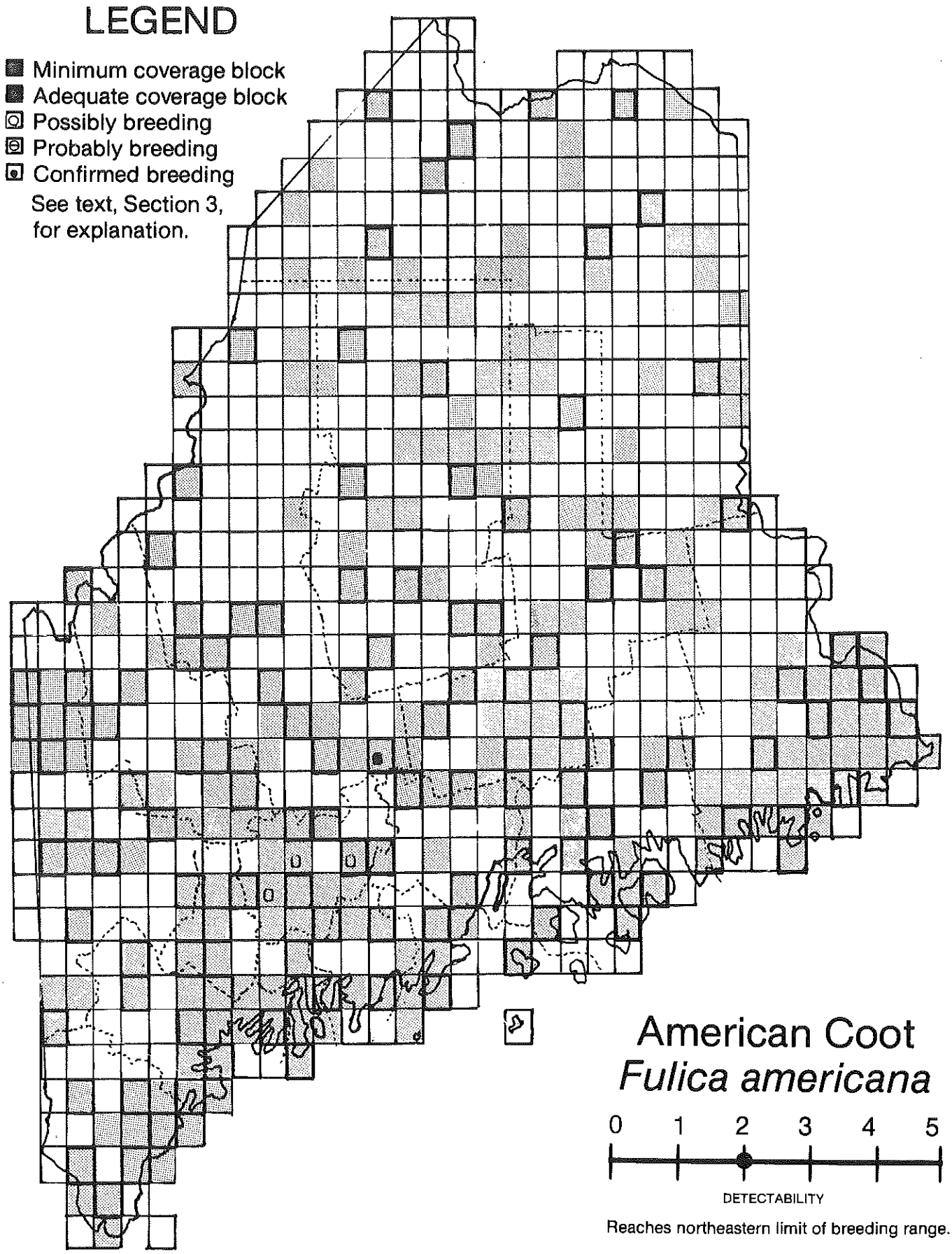


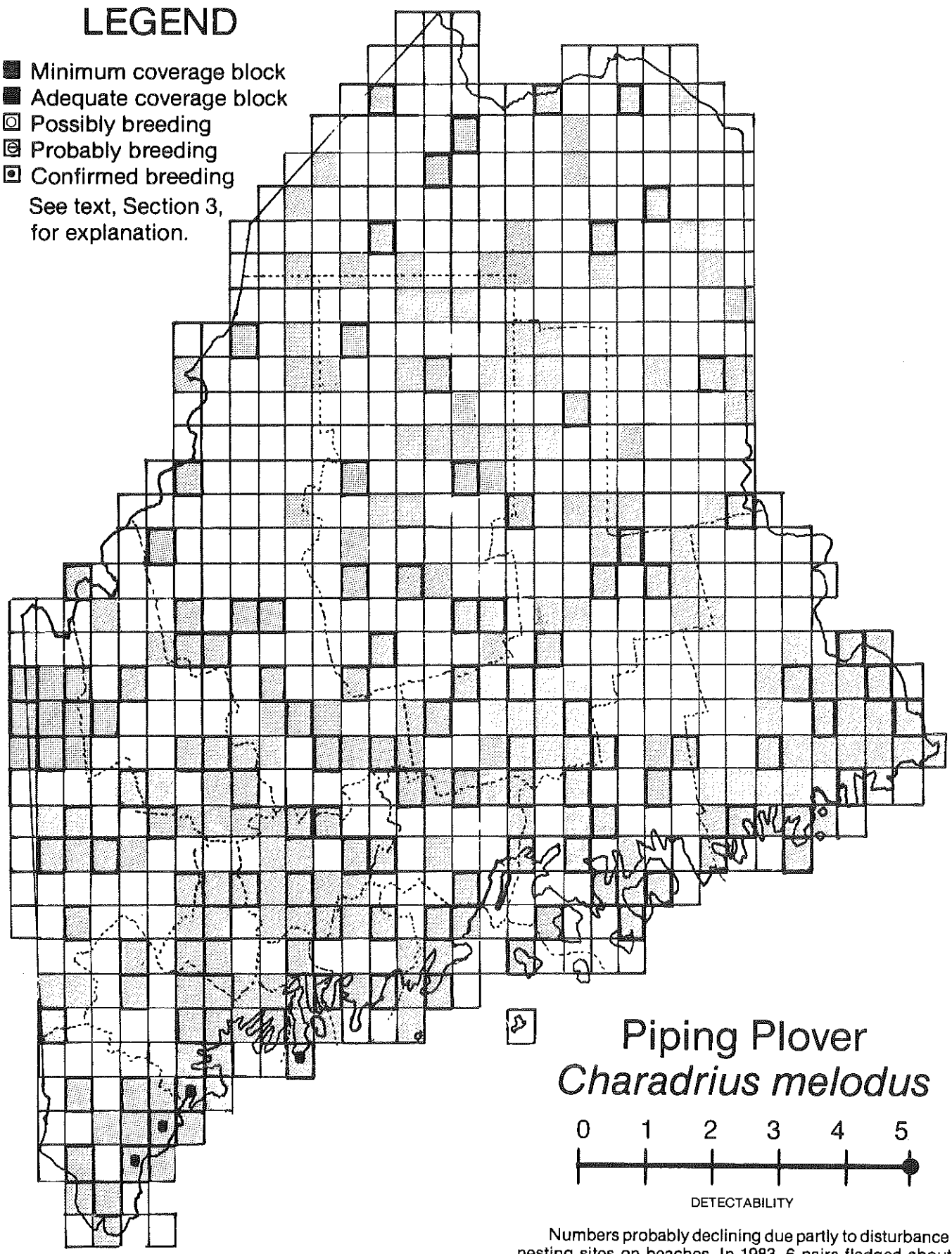
Reintroduced at various intervals and localities. Some released groups have become self-sustaining.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Virginia Rail
Rallus limicola
0 1 2 3 4 5
DETECTABILITY
Note low detectability score.

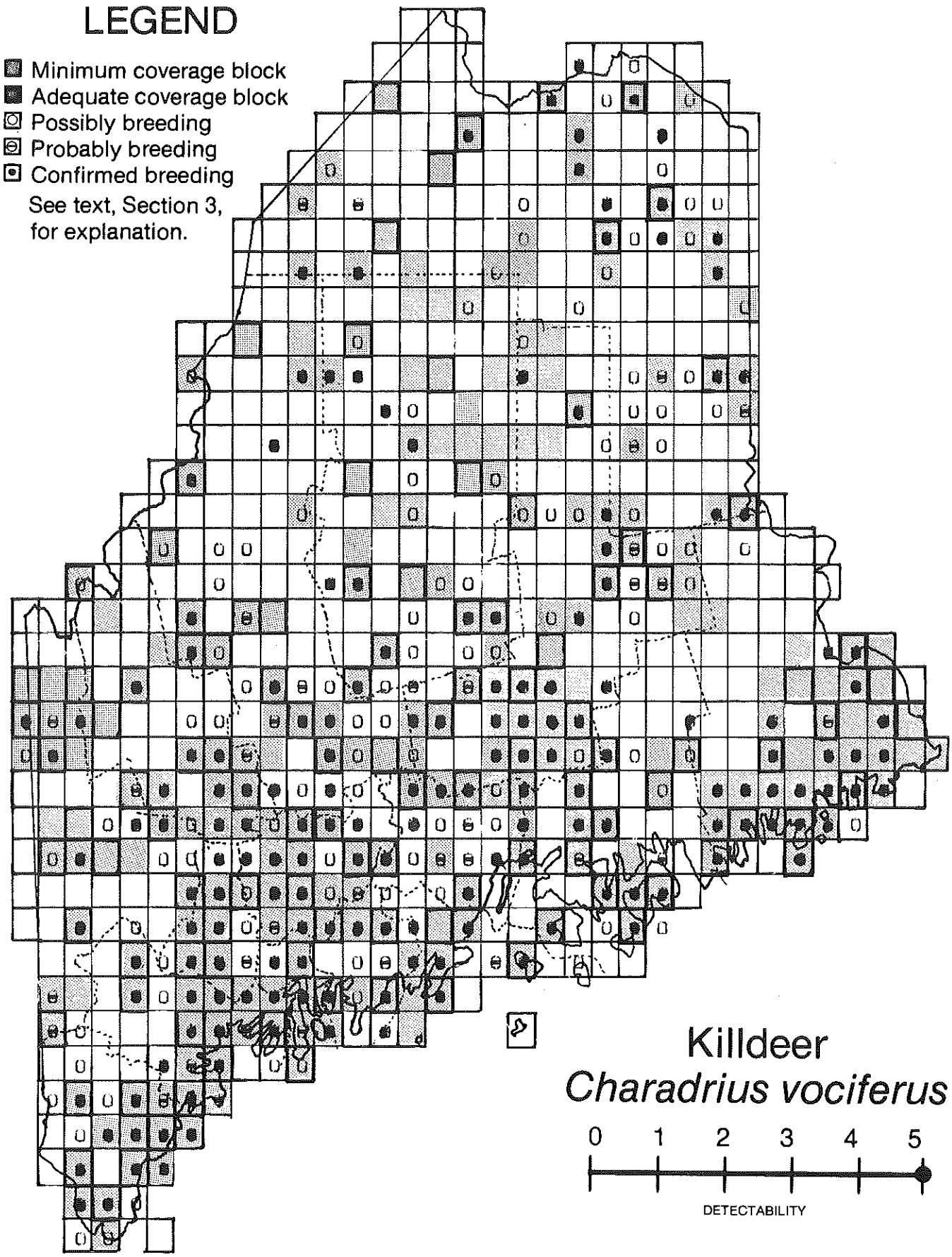

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Sora
Porzana carolina
0 1 2 3 4 5
DETECTABILITY
Note low detectability score.

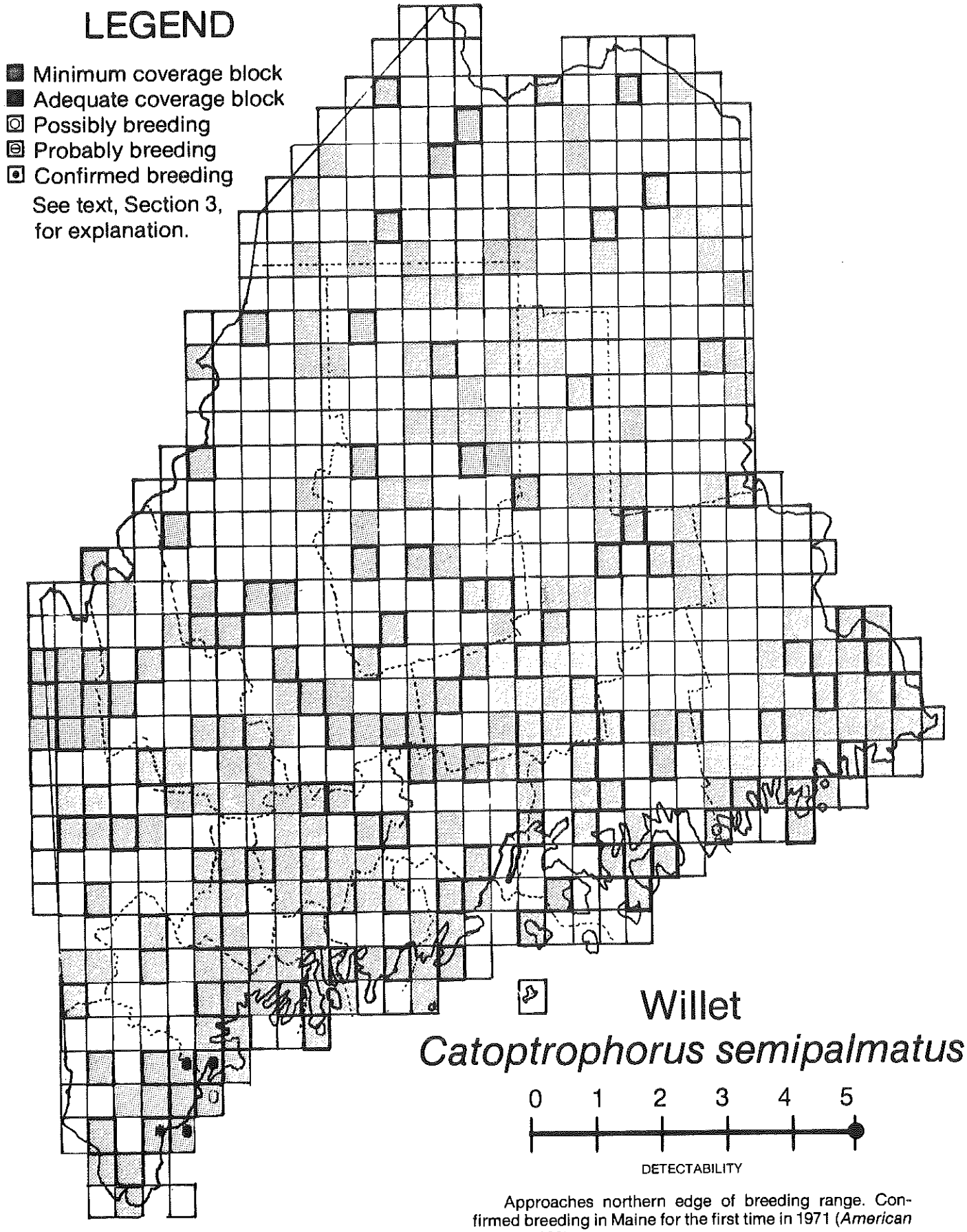

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Common Moorhen
Gallinula chloropus
0 1 2 3 4 5
DETECTABILITY
At northern edge of breeding range.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
American Coot
Fulica americana
0 1 2 3 4 5
DETECTABILITY
Reaches northeastern limit of breeding range.

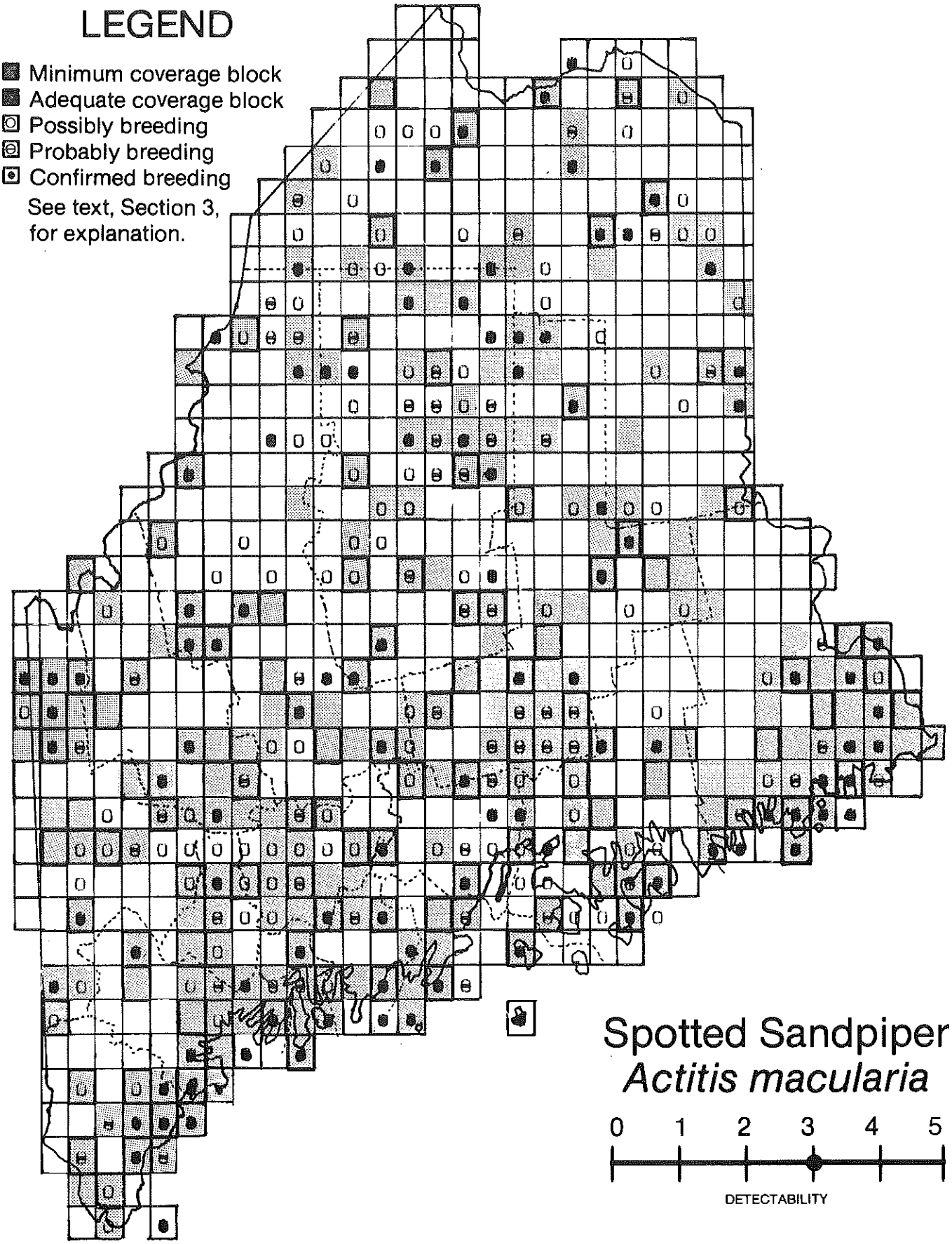


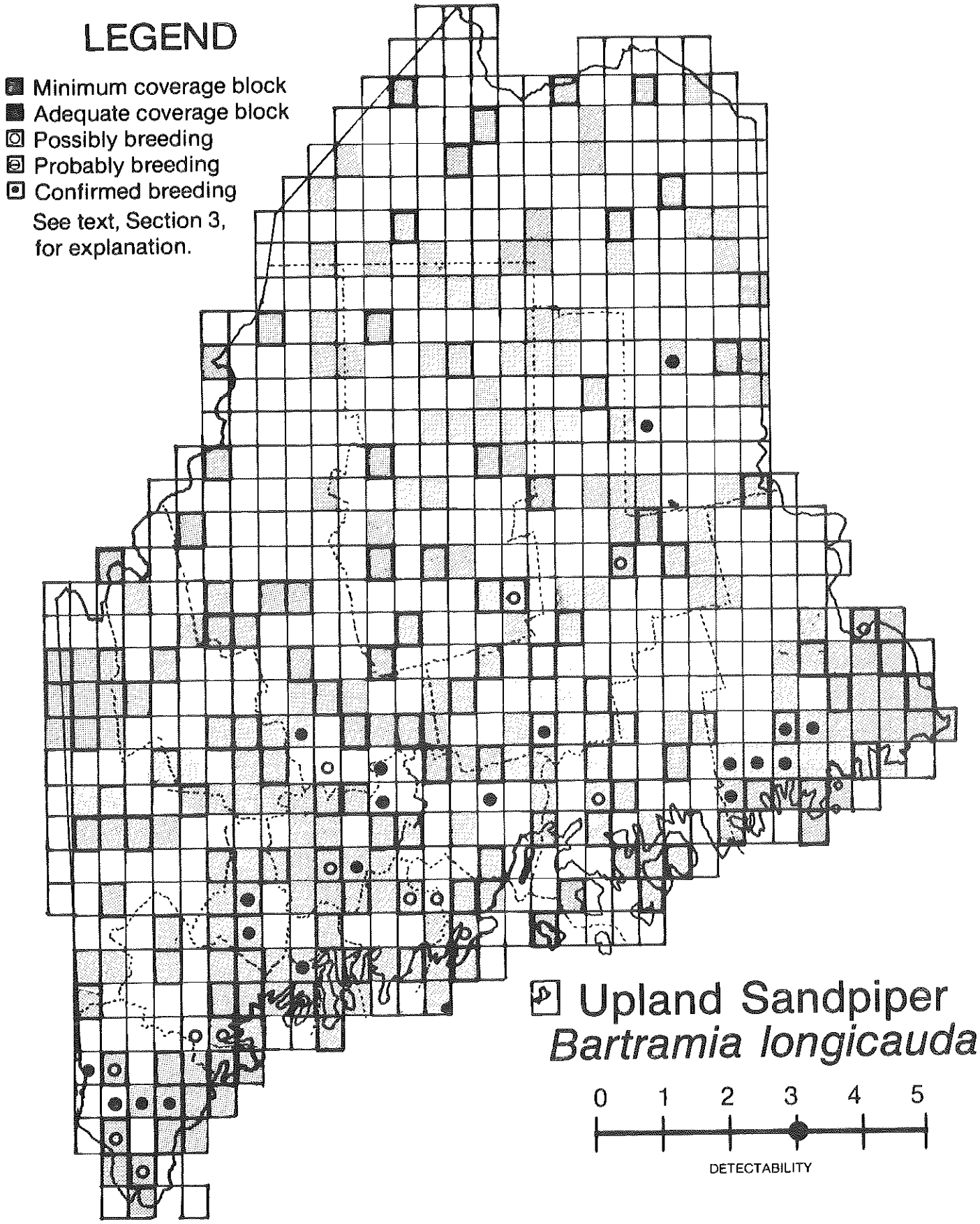
Numbers probably declining due partly to disturbance of nesting sites on beaches. In 1983, 6 pairs fledged about 7 young from 4 sites. See Dorr (1976b).

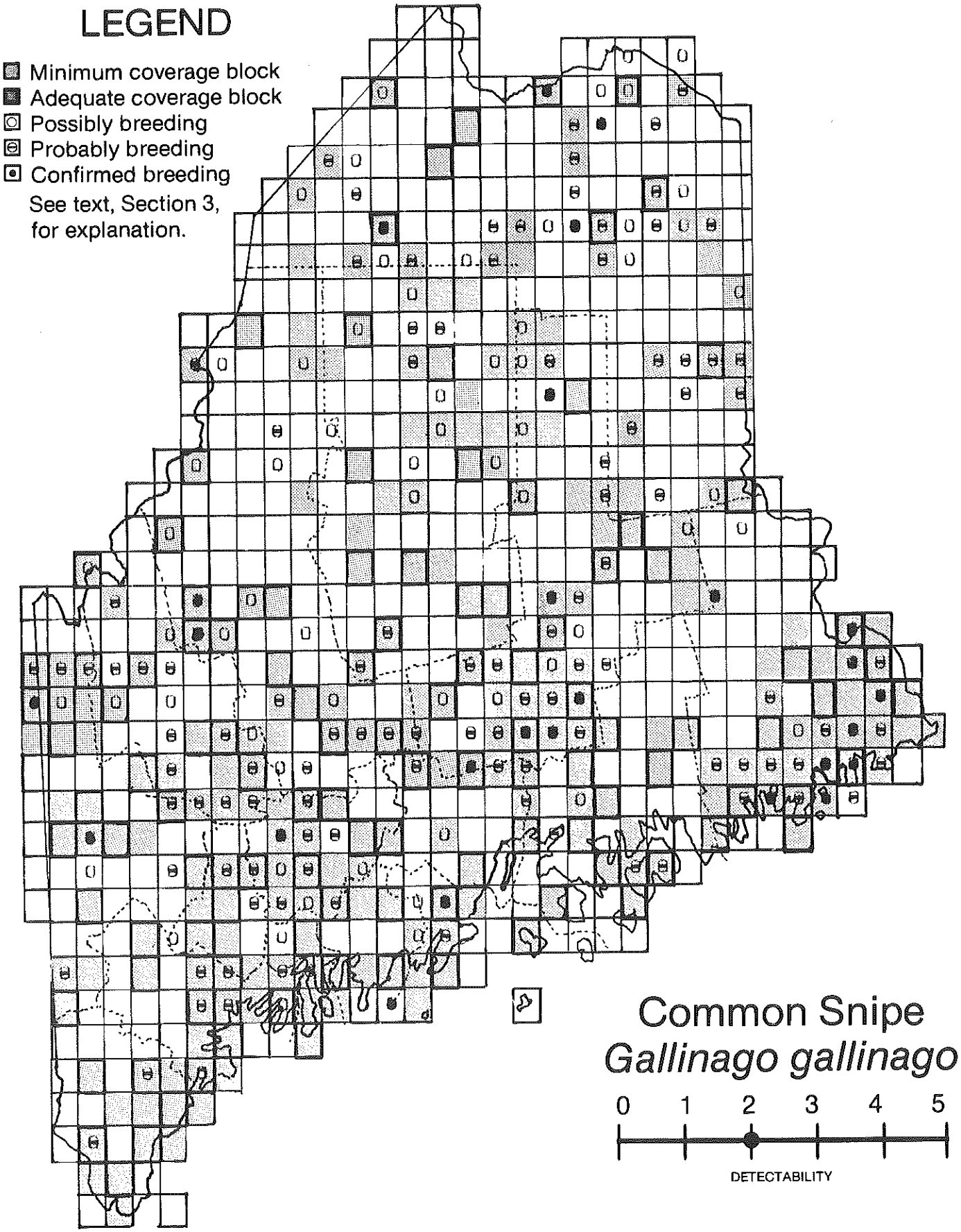

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Killdeer
Charadrius vociferus
0 1 2 3 4 5
DETECTABILITY

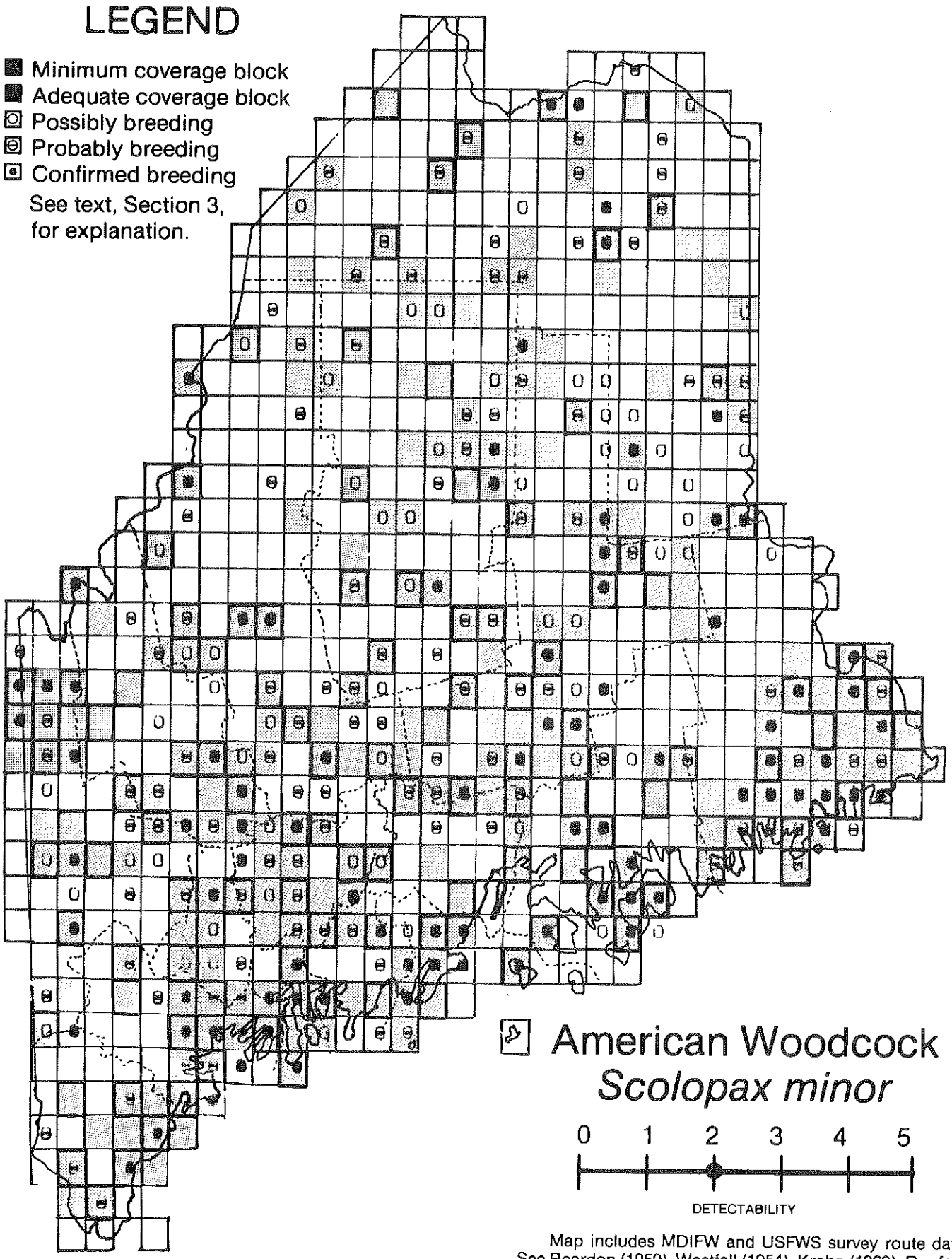


Approaches northern edge of breeding range. Confirmed breeding in Maine for the first time in 1971 (*American Birds* 25:833).

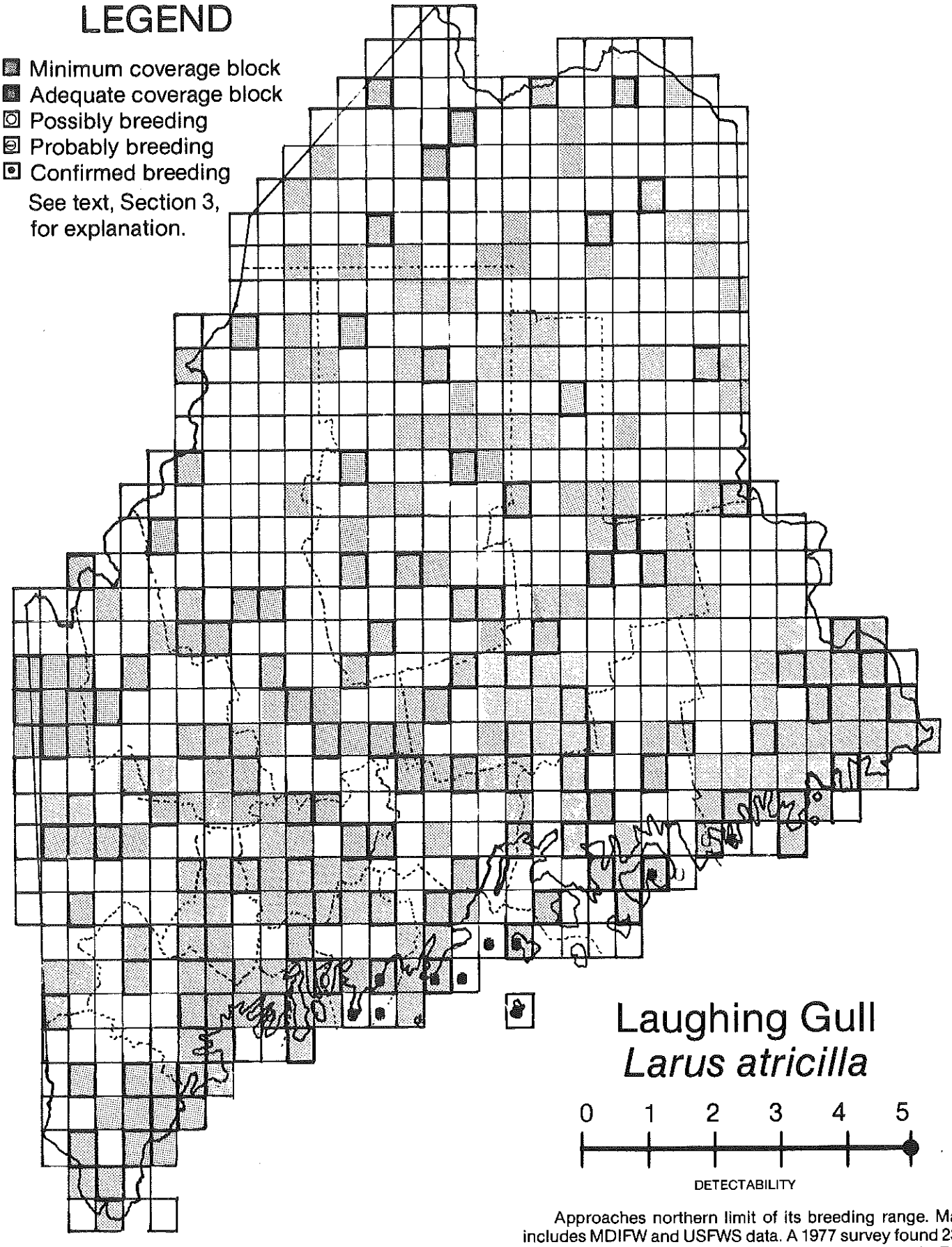

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Spotted Sandpiper
Actitis macularia
0 1 2 3 4 5
DETECTABILITY


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Upland Sandpiper
Bartramia longicauda
0 1 2 3 4 5
DETECTABILITY

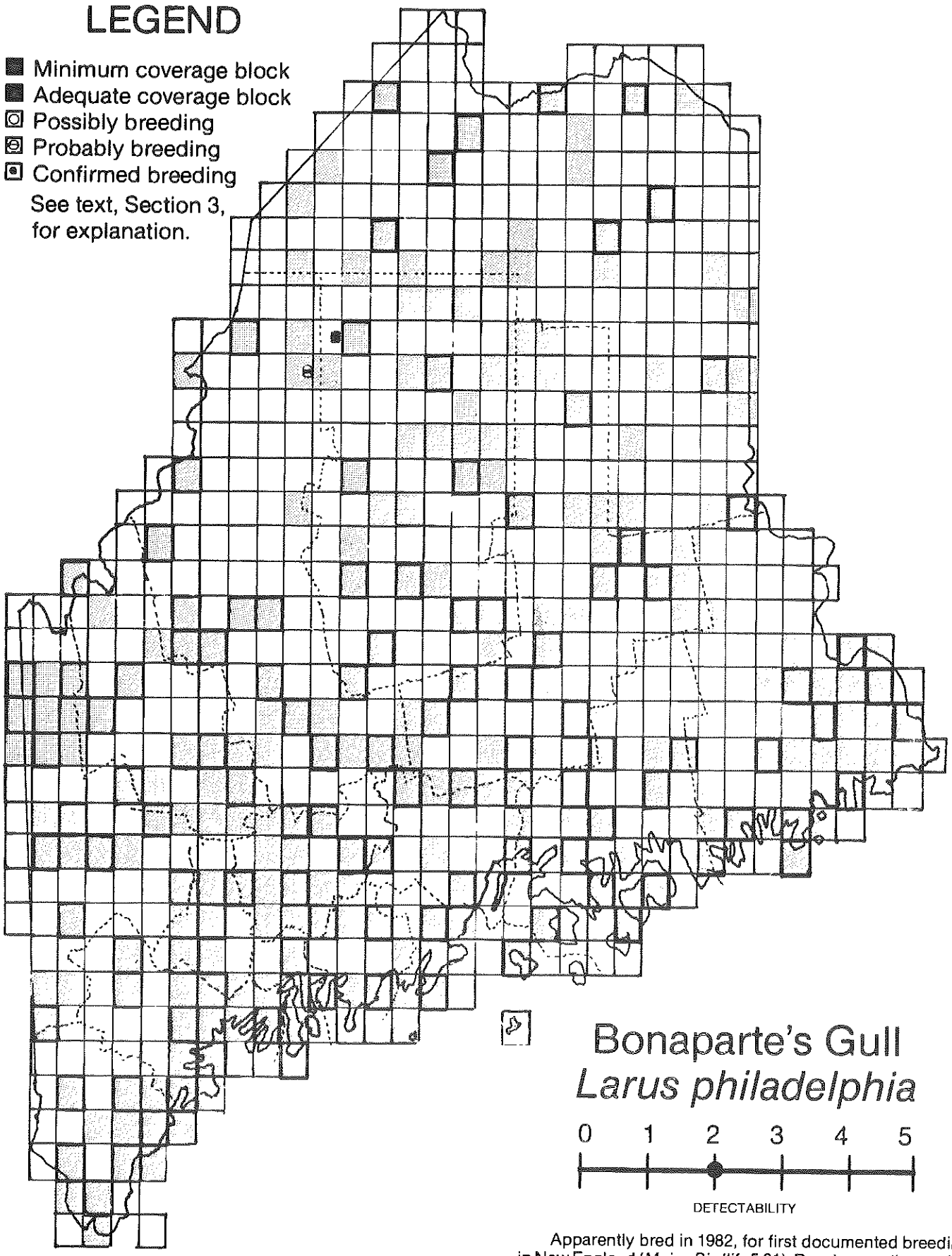

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Common Snipe
Gallinago gallinago
0 1 2 3 4 5
DETECTABILITY



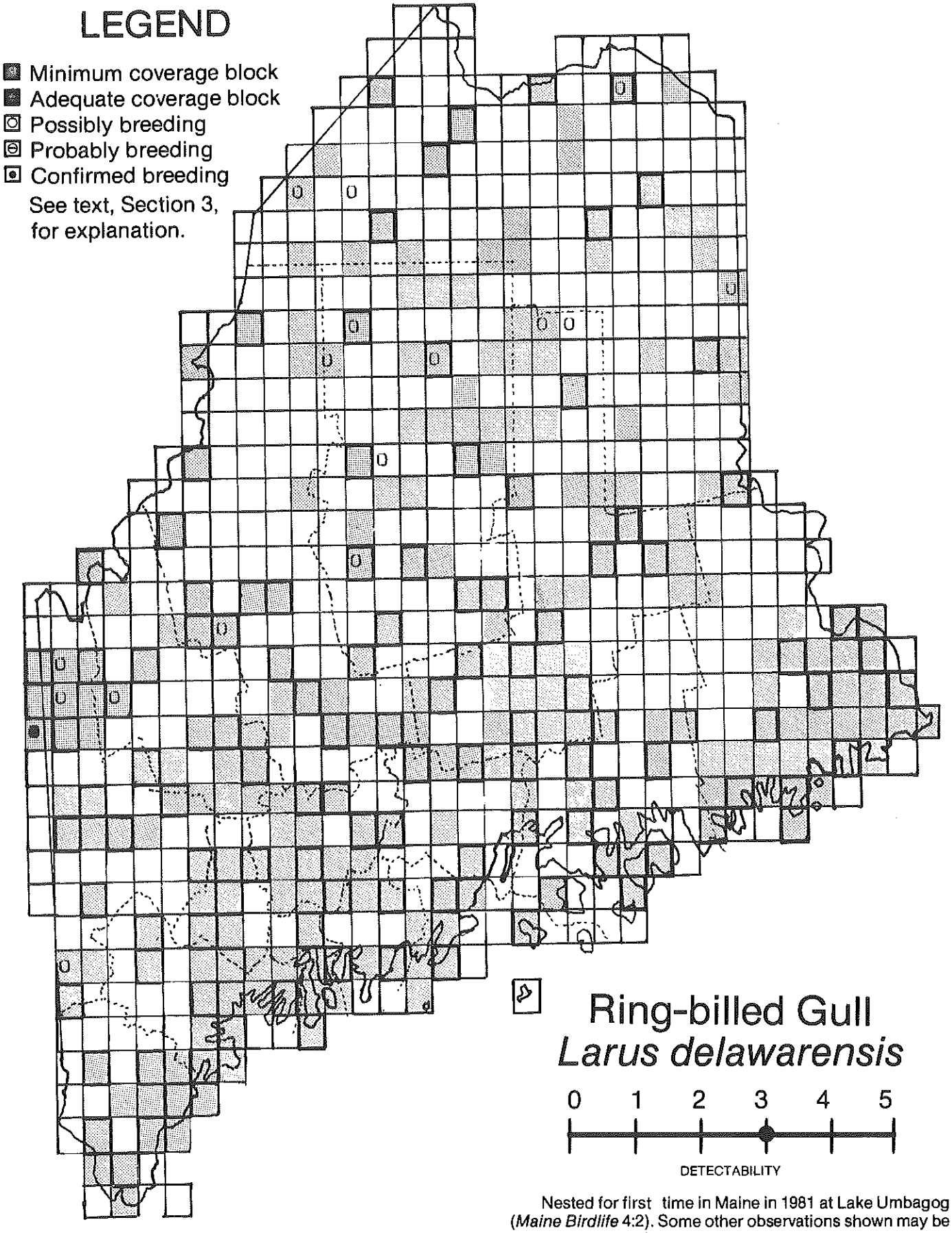
Map includes MDIFW and USFWS survey route data. See Reardon (1950), Westfall (1954), Krohn (1969), Dunford (1971), Ramakka (1971), Corr *et al.* (1977), Nicholson (1977), and Sepik *et al.* (1981).



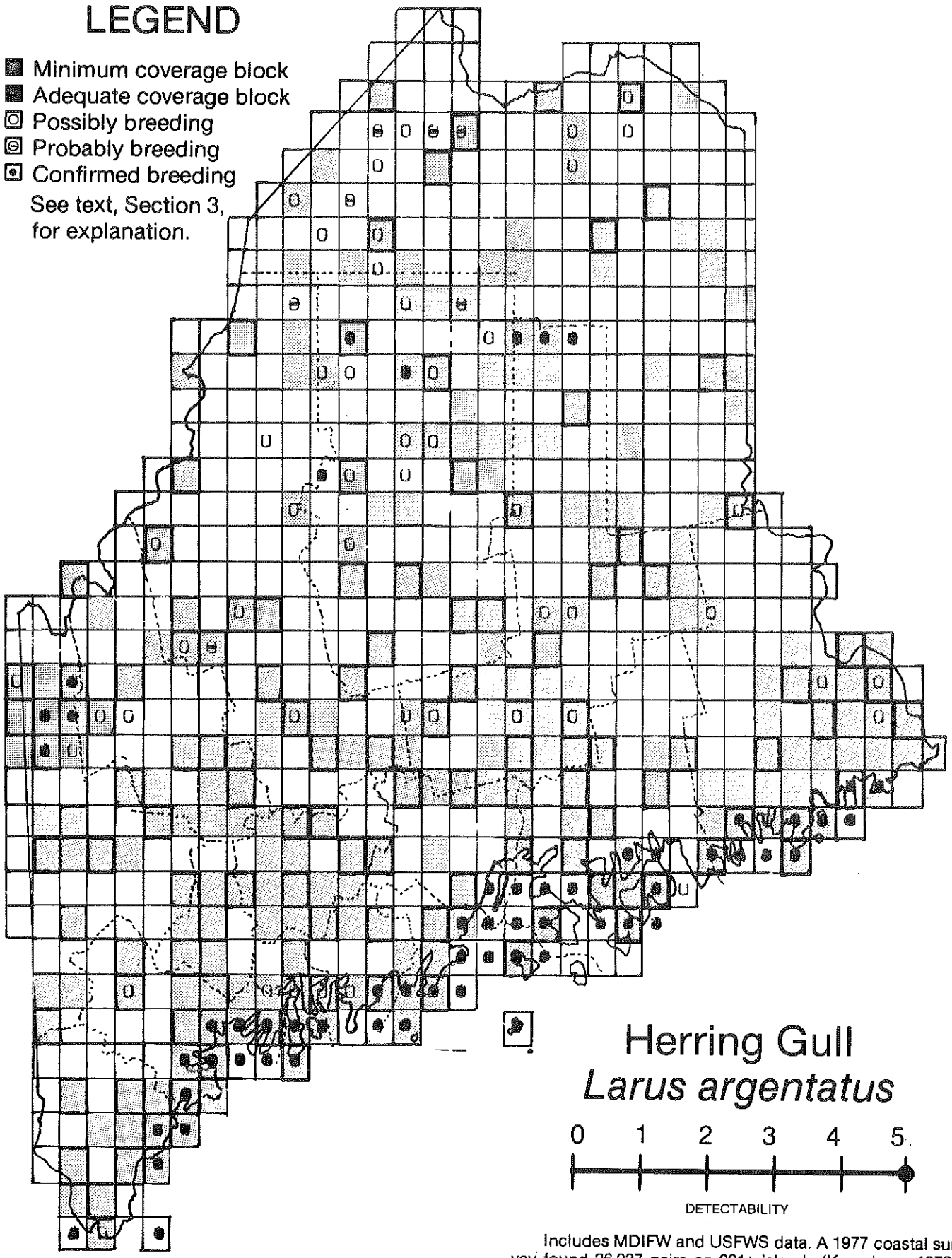
Approaches northern limit of its breeding range. Map includes MDIFW and USFWS data. A 1977 survey found 231 pairs on 6 islands (Korschgen 1979). See also Nisbet (1971).



Apparently bred in 1982, for first documented breeding in New England (*Maine Birdlife* 5:31). Reaches southern edge of breeding range.



Nested for first time in Maine in 1981 at Lake Umbagog (*Maine Birdlife* 4:2). Some other observations shown may be nonbreeding individuals.

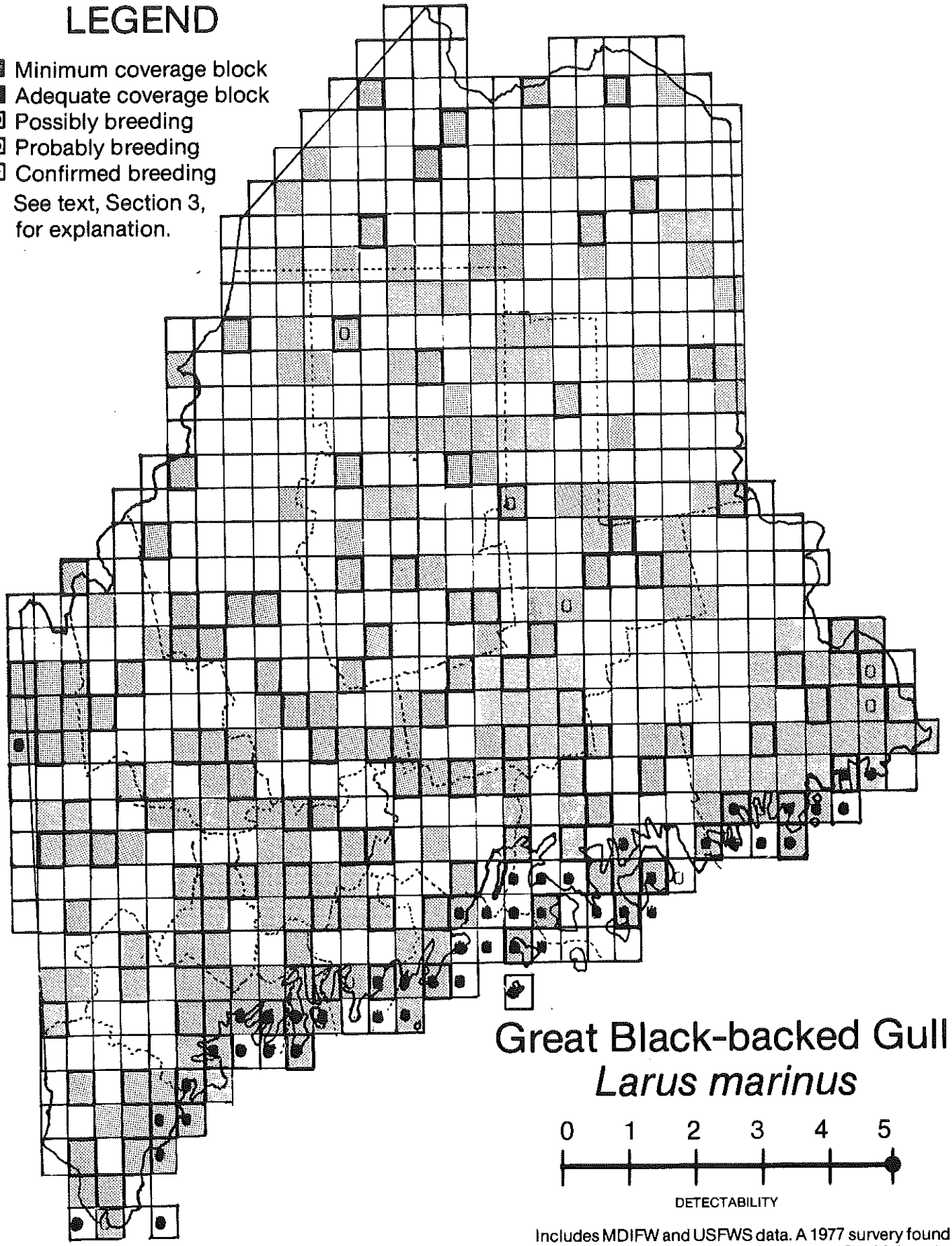


Herring Gull
Larus argentatus

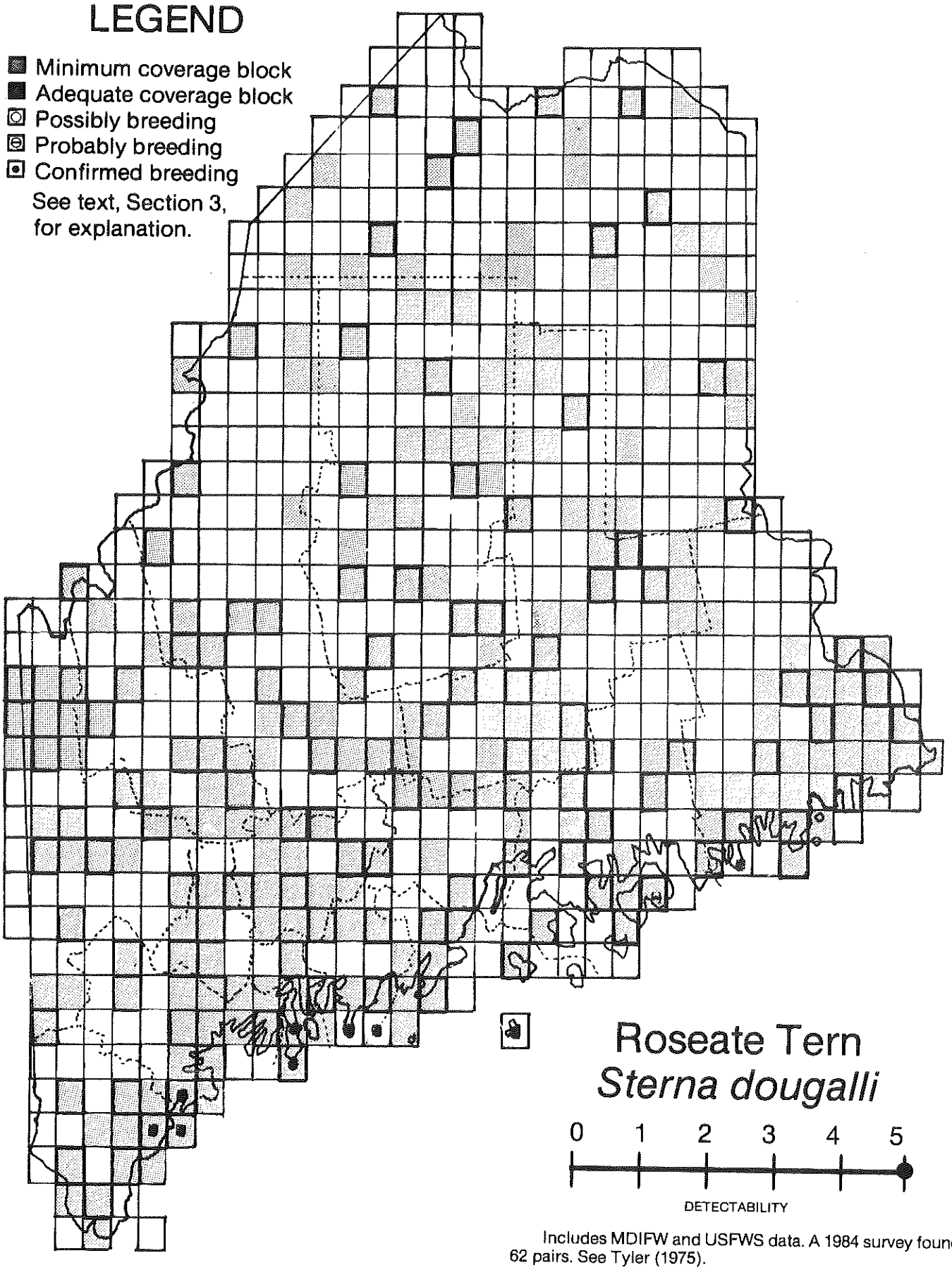
0 1 2 3 4 5

DETECTABILITY

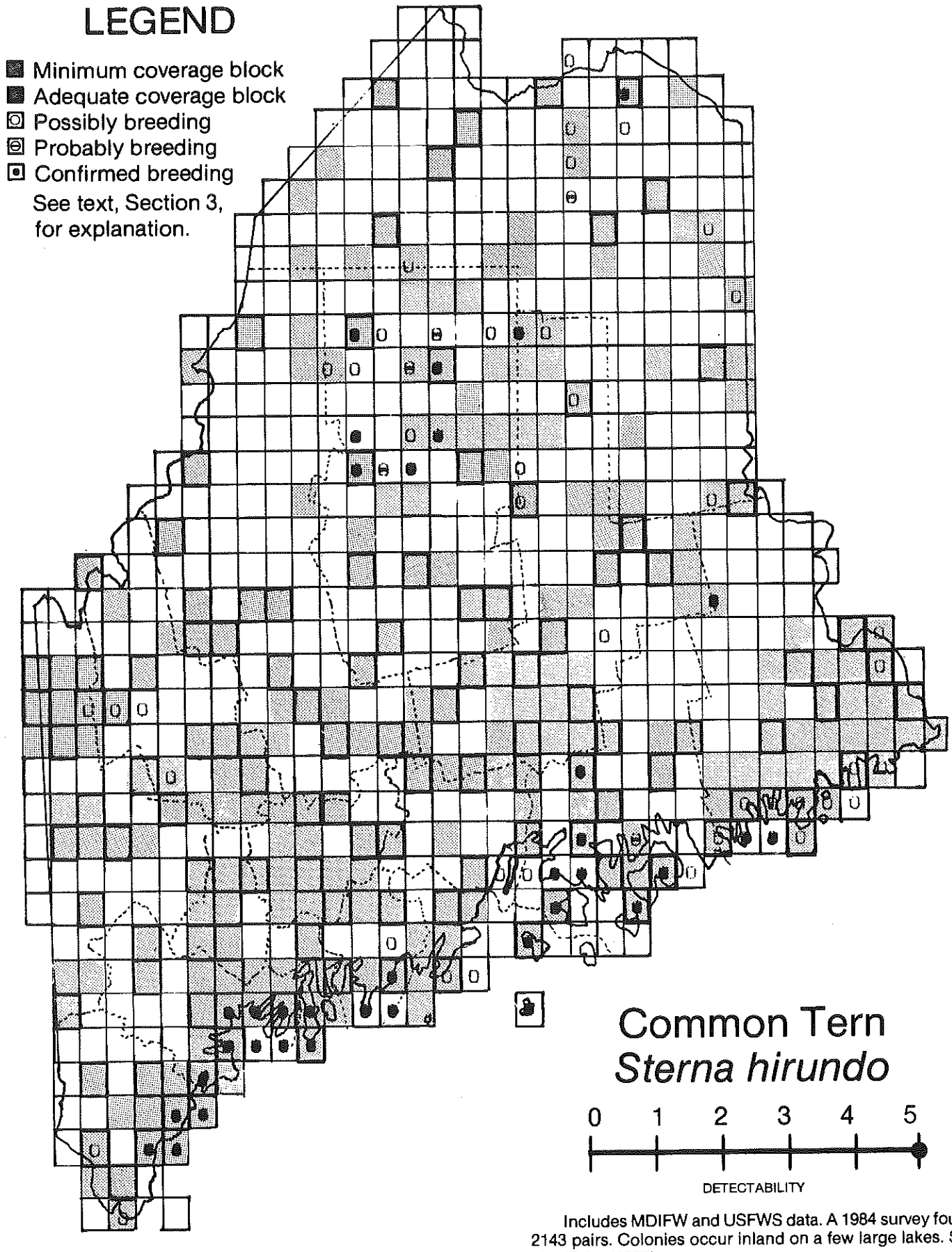
Includes MDIFW and USFWS data. A 1977 coastal survey found 26,037 pairs on 221+ islands (Korschgen 1979). Breeds inland on many larger lakes, but not well inventoried in this habitat. See McLaughlin (1967), Kadlec and Drury (1968), Schreiber (1968), Bourget (1972, 1973), Drury and Kadlec (1974), and Burger and Gochfeld (1981).



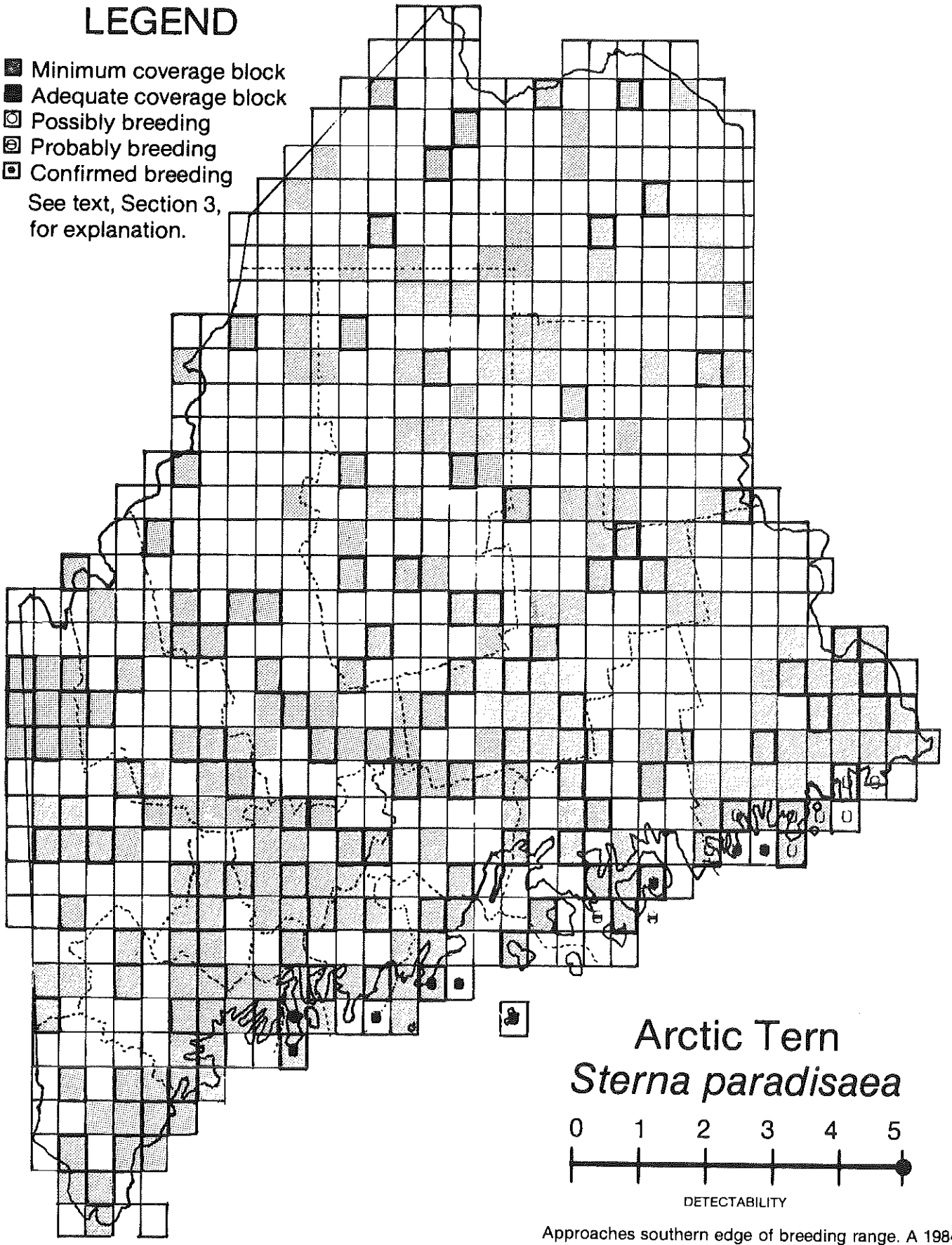
Includes MDIFW and USFWS data. A 1977 survery found 9847+ pairs on 219+ islands (Korschgen 1979). See McLaughlin (1967), Bourget (1972, 1973), and French (1982).



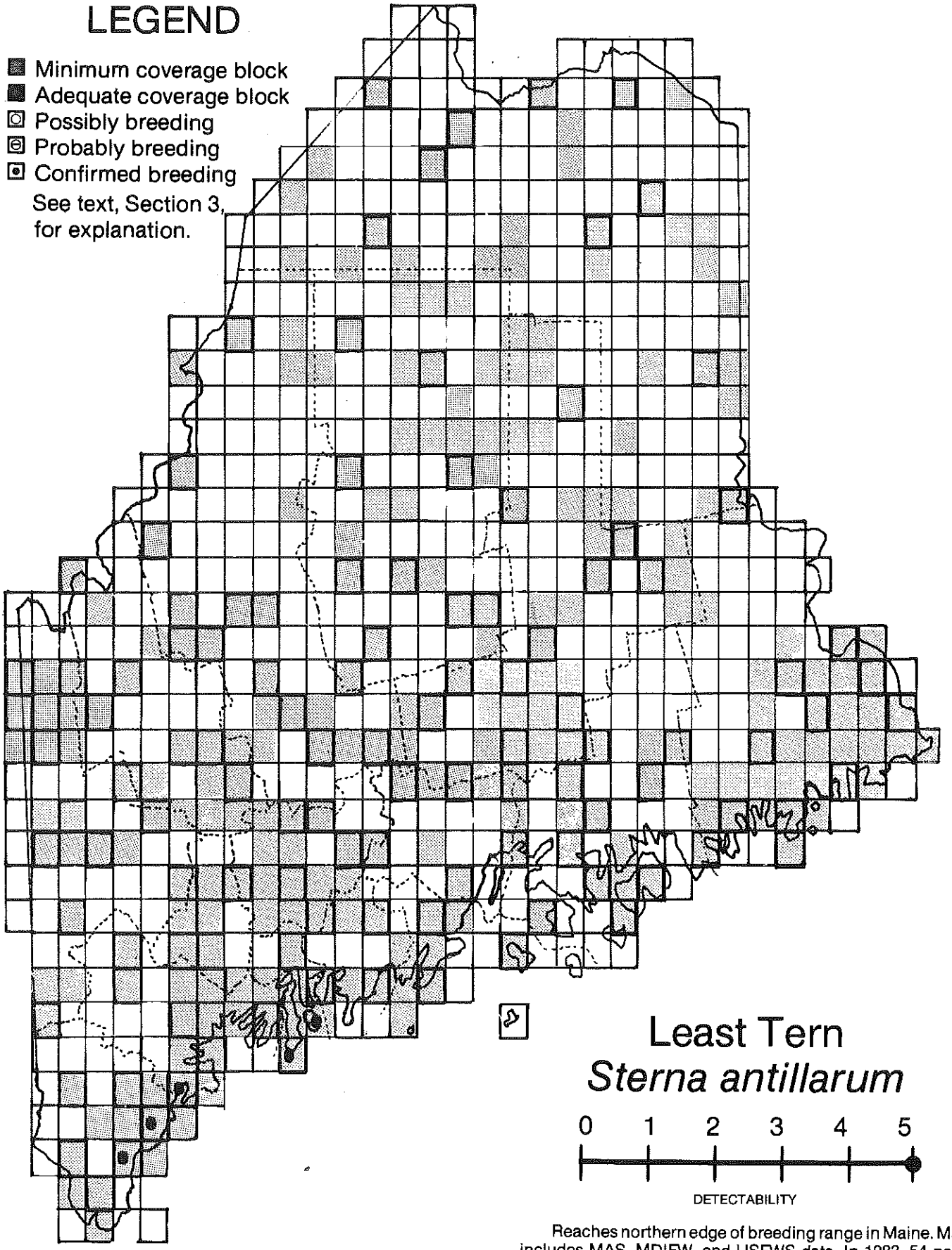
Includes MDIFW and USFWS data. A 1984 survey found 62 pairs. See Tyler (1975).



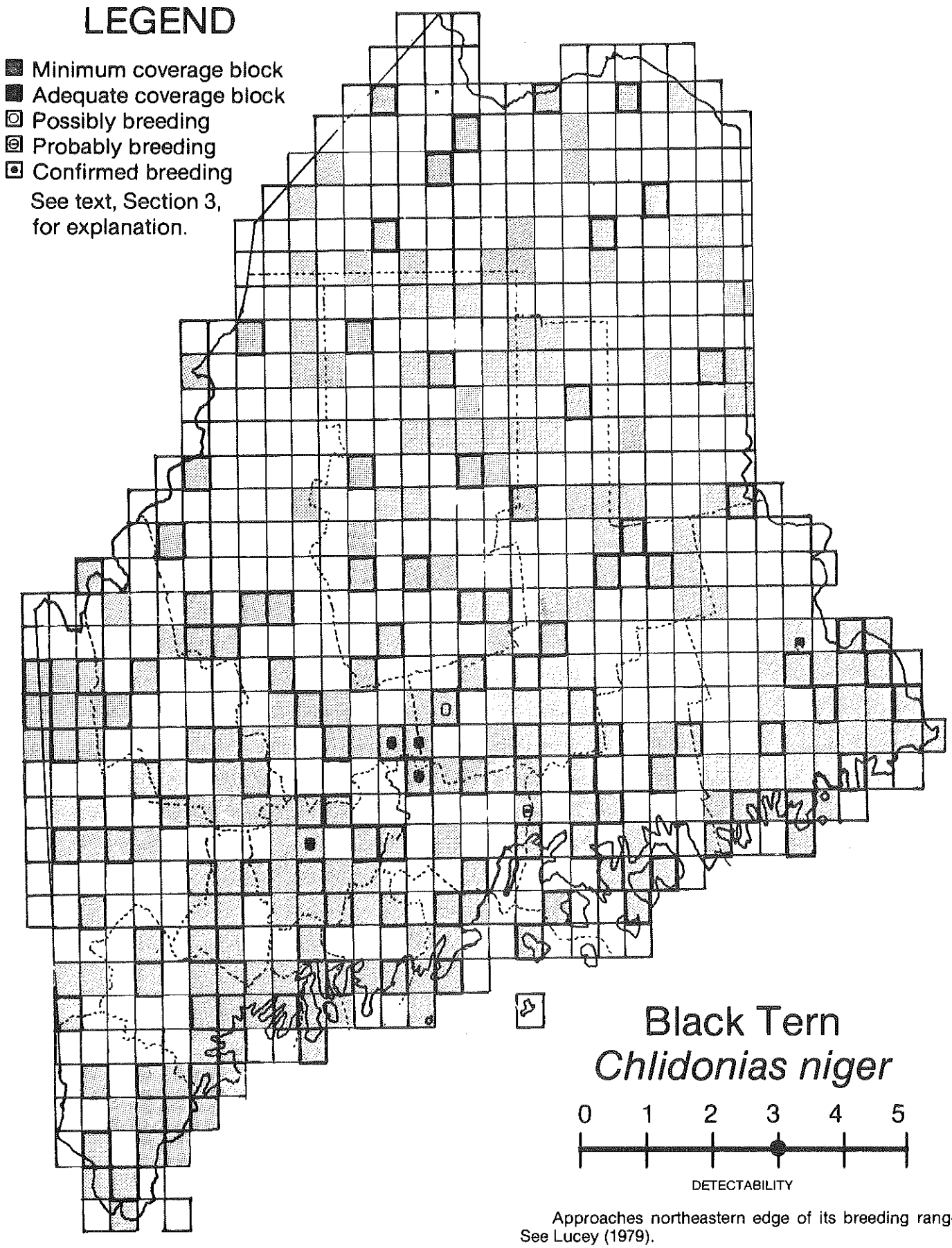
Includes MDIFW and USFWS data. A 1984 survey found 2143 pairs. Colonies occur inland on a few large lakes. See also Tyler (1975).



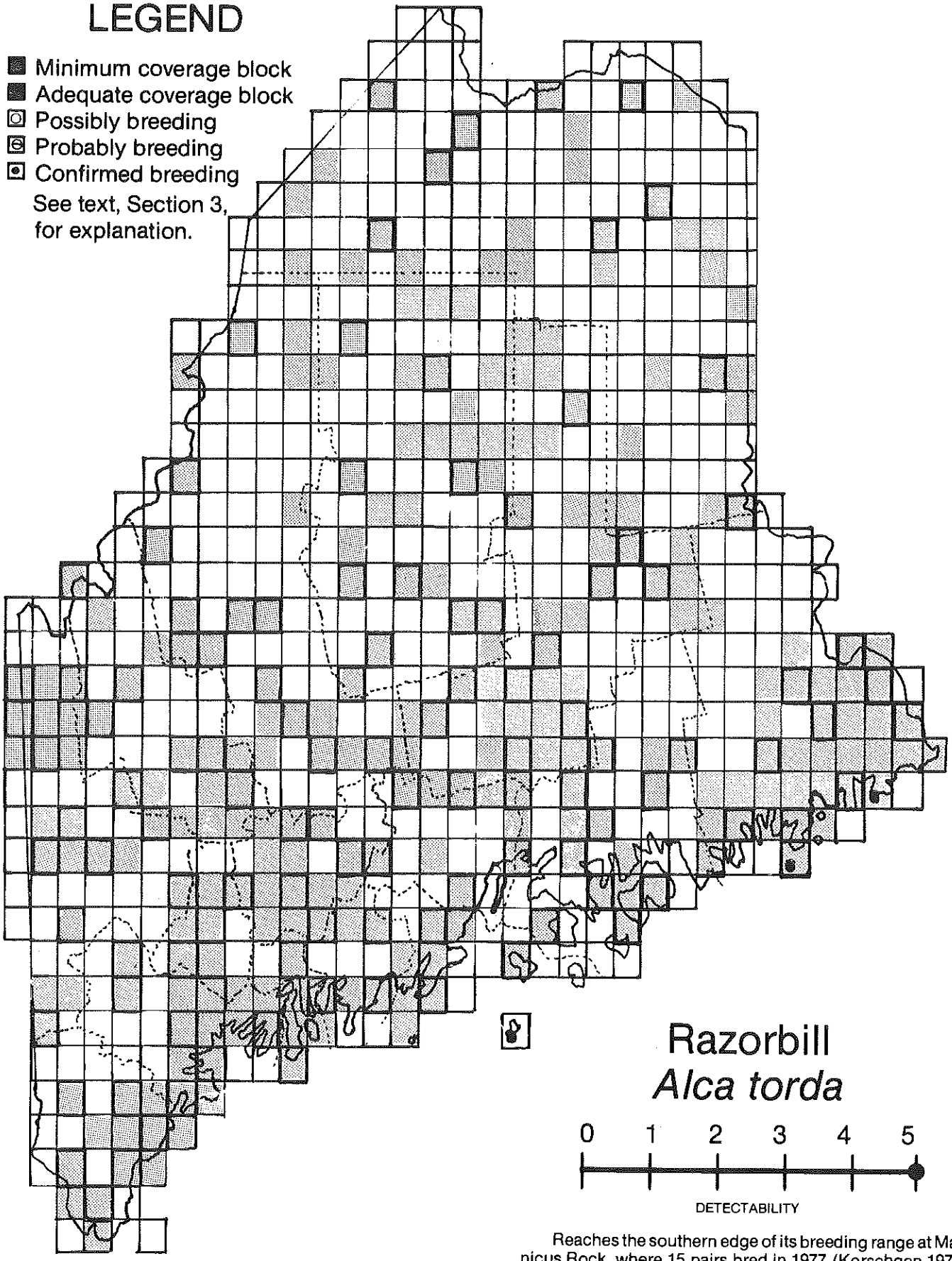
Approaches southern edge of breeding range. A 1984 survey found 1631 pairs. Includes MDIFW and USFWS data. See also Tyler (1975).



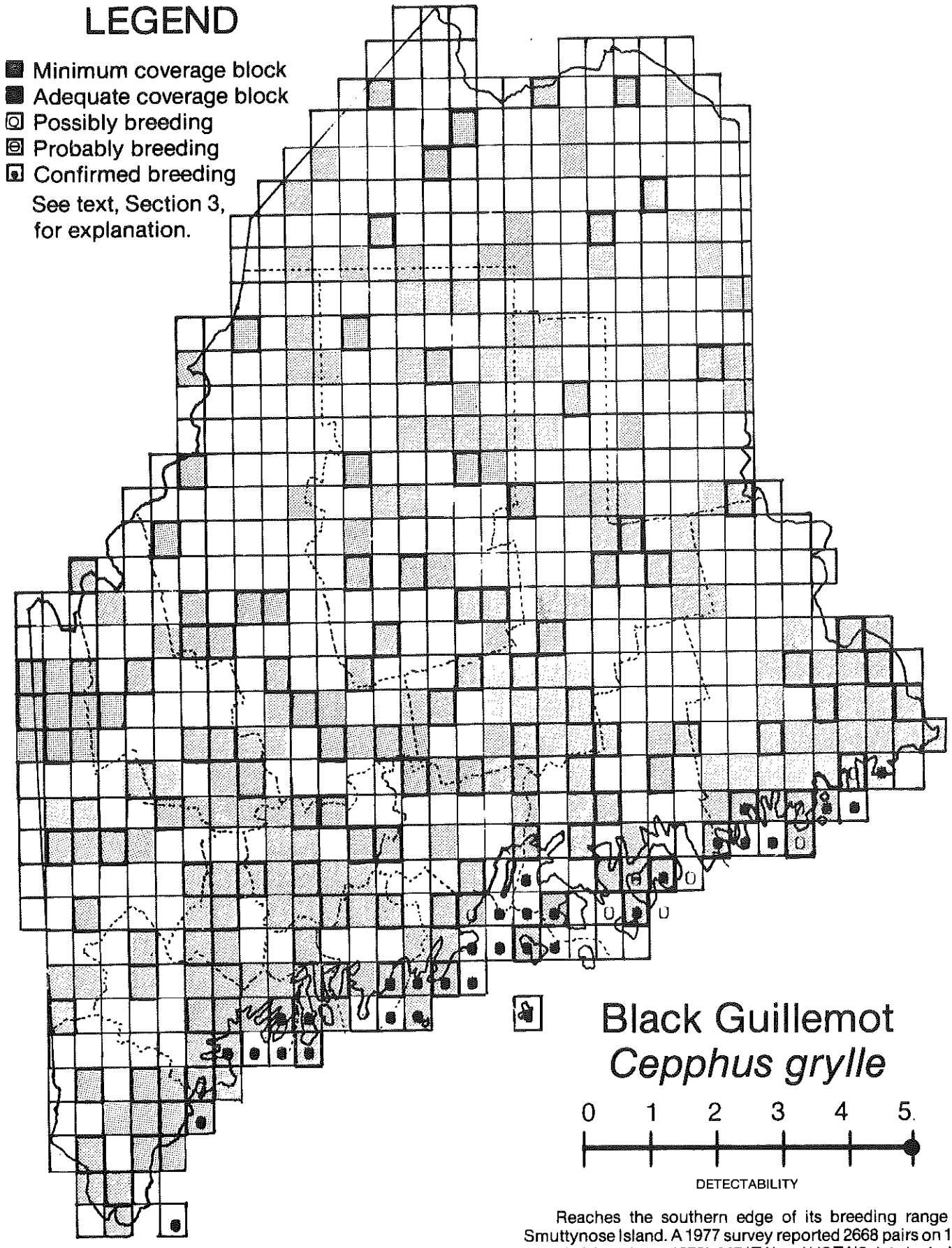
Reaches northern edge of breeding range in Maine. Map includes MAS, MDIFW, and USFWS data. In 1983, 54 pairs fledged about 29 young from 4 sites. See Hunter (1975), Dorr (1976).



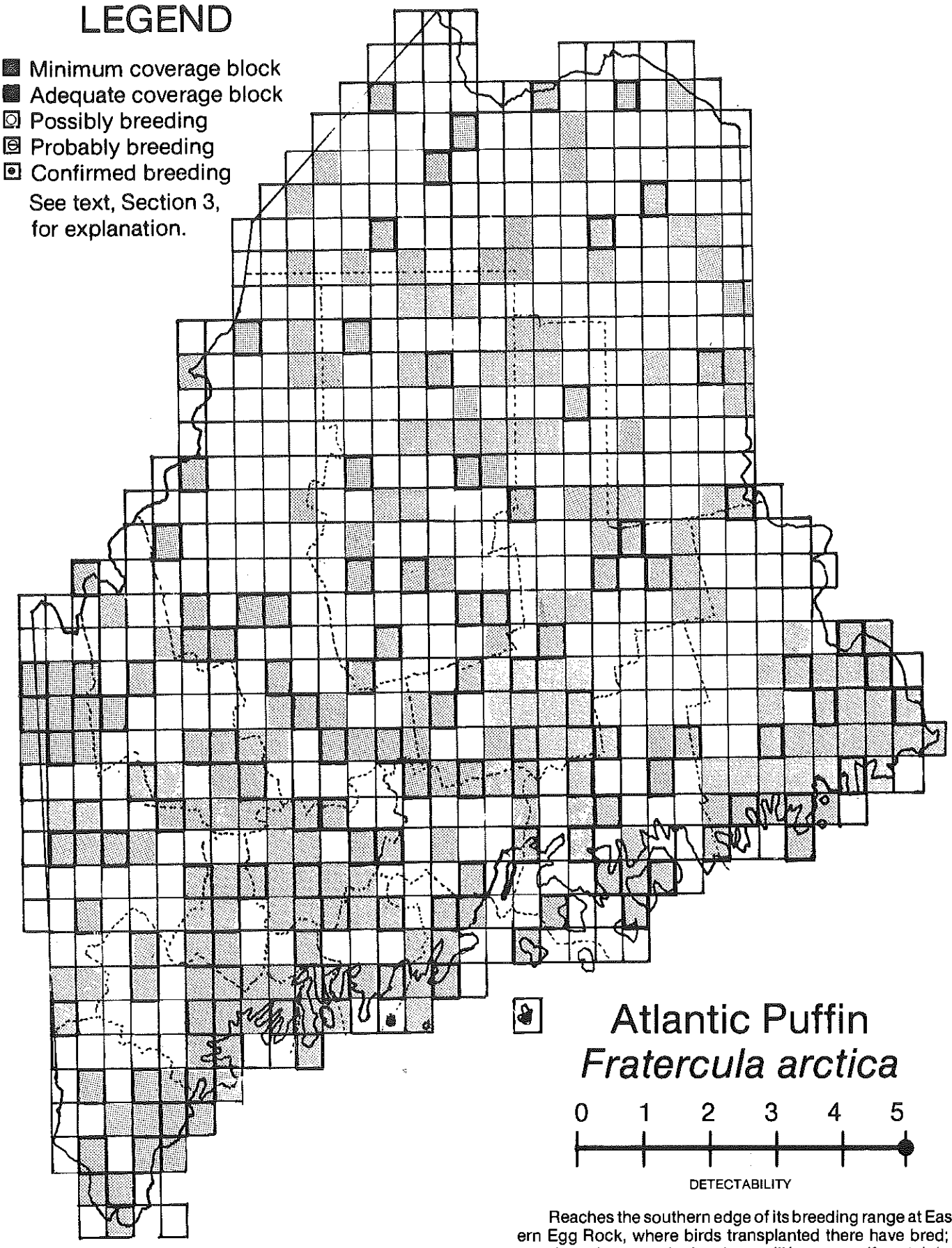
Approaches northeastern edge of its breeding range. See Lucey (1979).



Reaches the southern edge of its breeding range at Matinicus Rock, where 15 pairs bred in 1977 (Korschgen 1979). First confirmed breeding in Maine in the mid 1960's. (Buchheister 1968).



Reaches the southern edge of its breeding range at Smuttynose Island. A 1977 survey reported 2668 pairs on 114 islands (Korschgen 1979). MDIFW and USFWS data included in map.

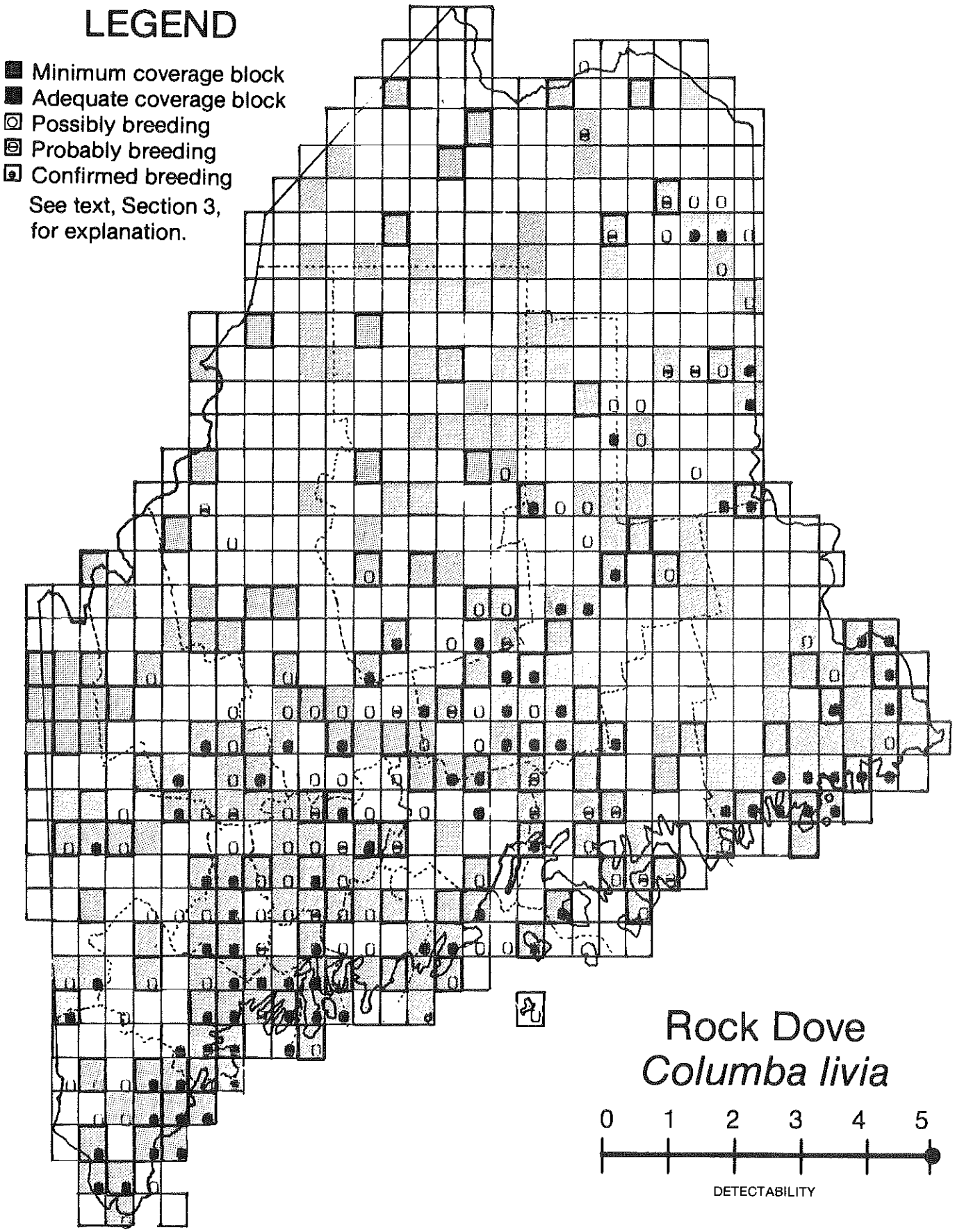


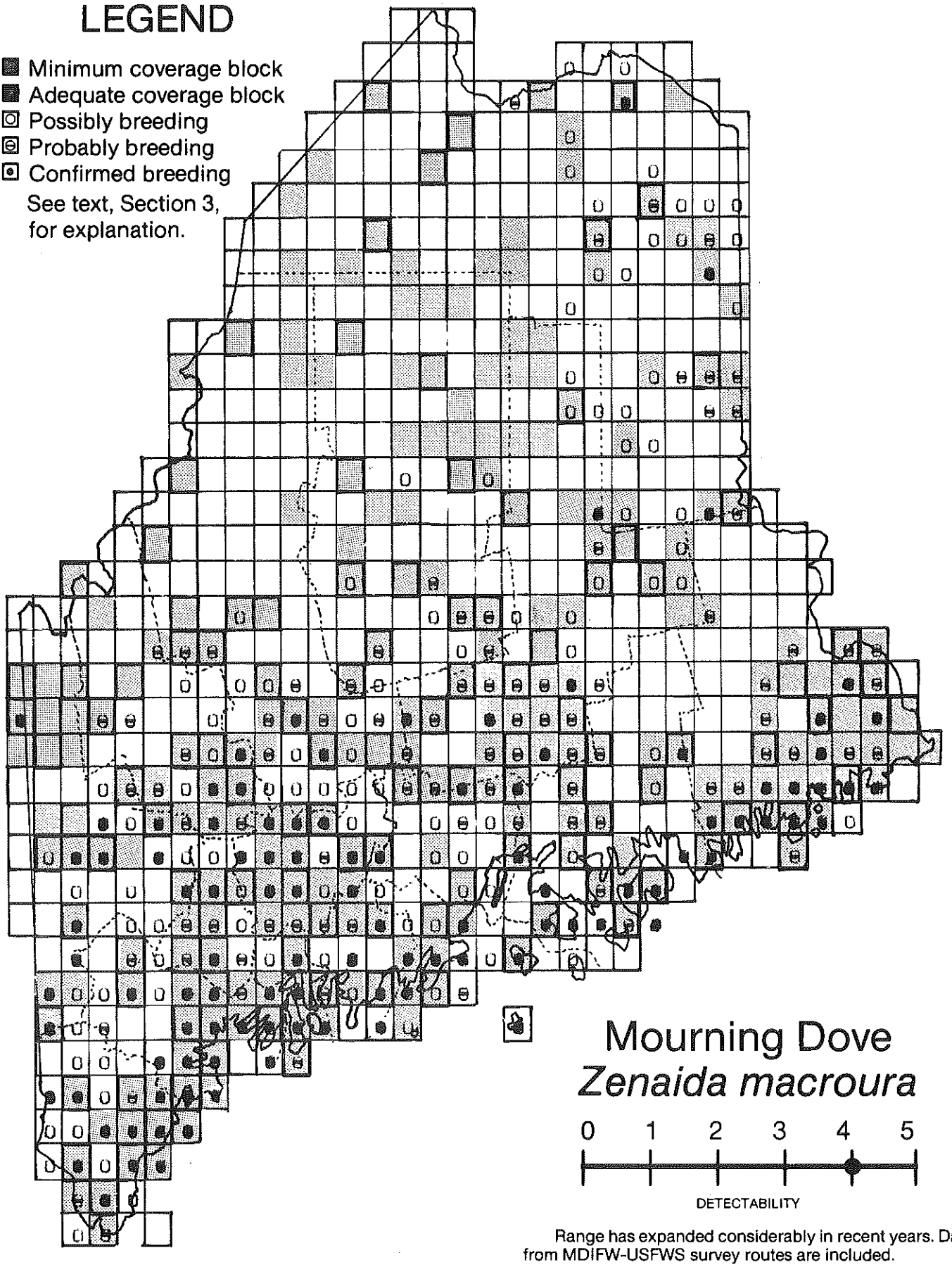
Atlantic Puffin
Fratercula arctica

0 1 2 3 4 5

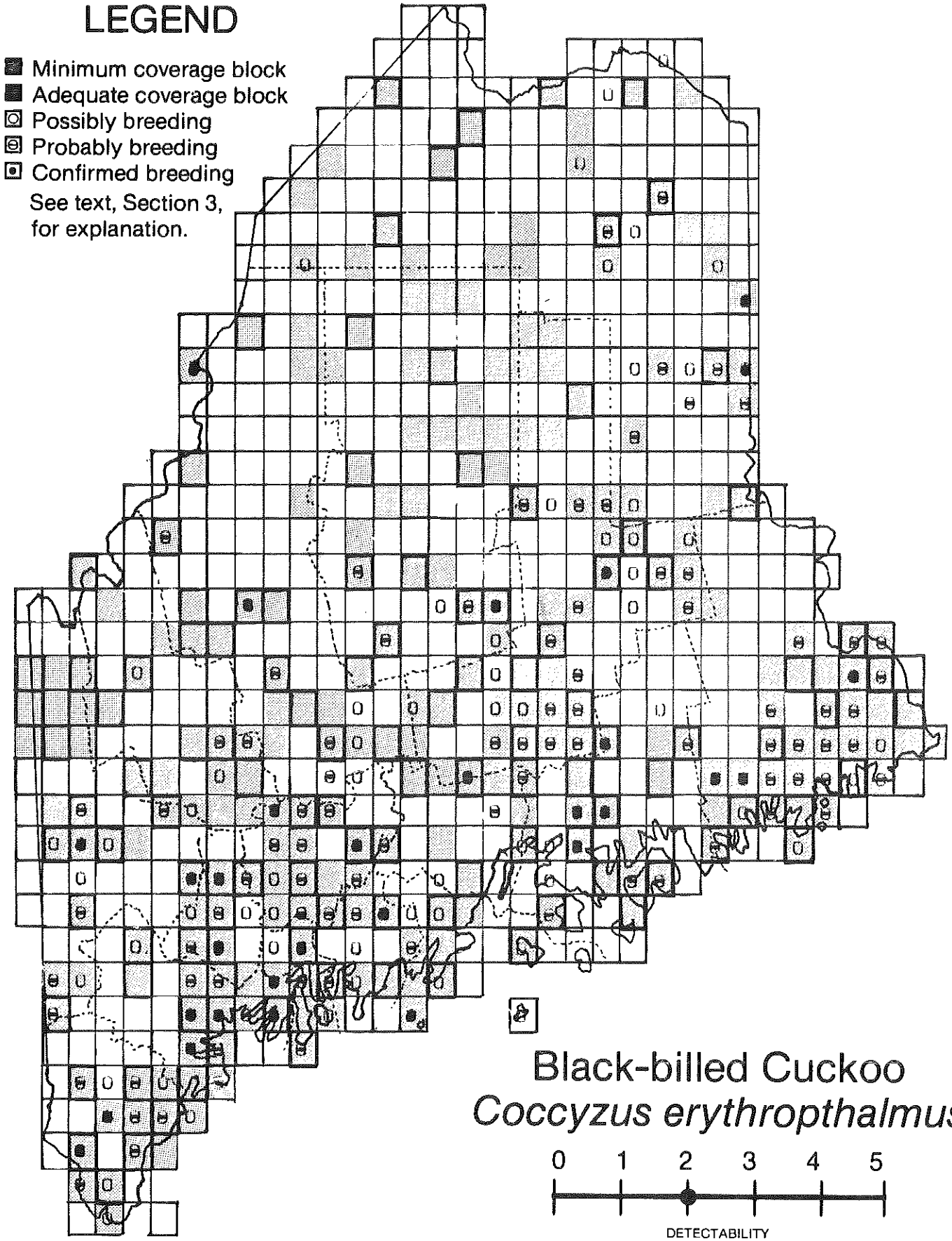
DETECTABILITY

Reaches the southern edge of its breeding range at Eastern Egg Rock, where birds transplanted there have bred; it remains to be seen whether these will become self-sustaining. Matinicus Rock also supports about 125 pairs (Korschgen 1979).

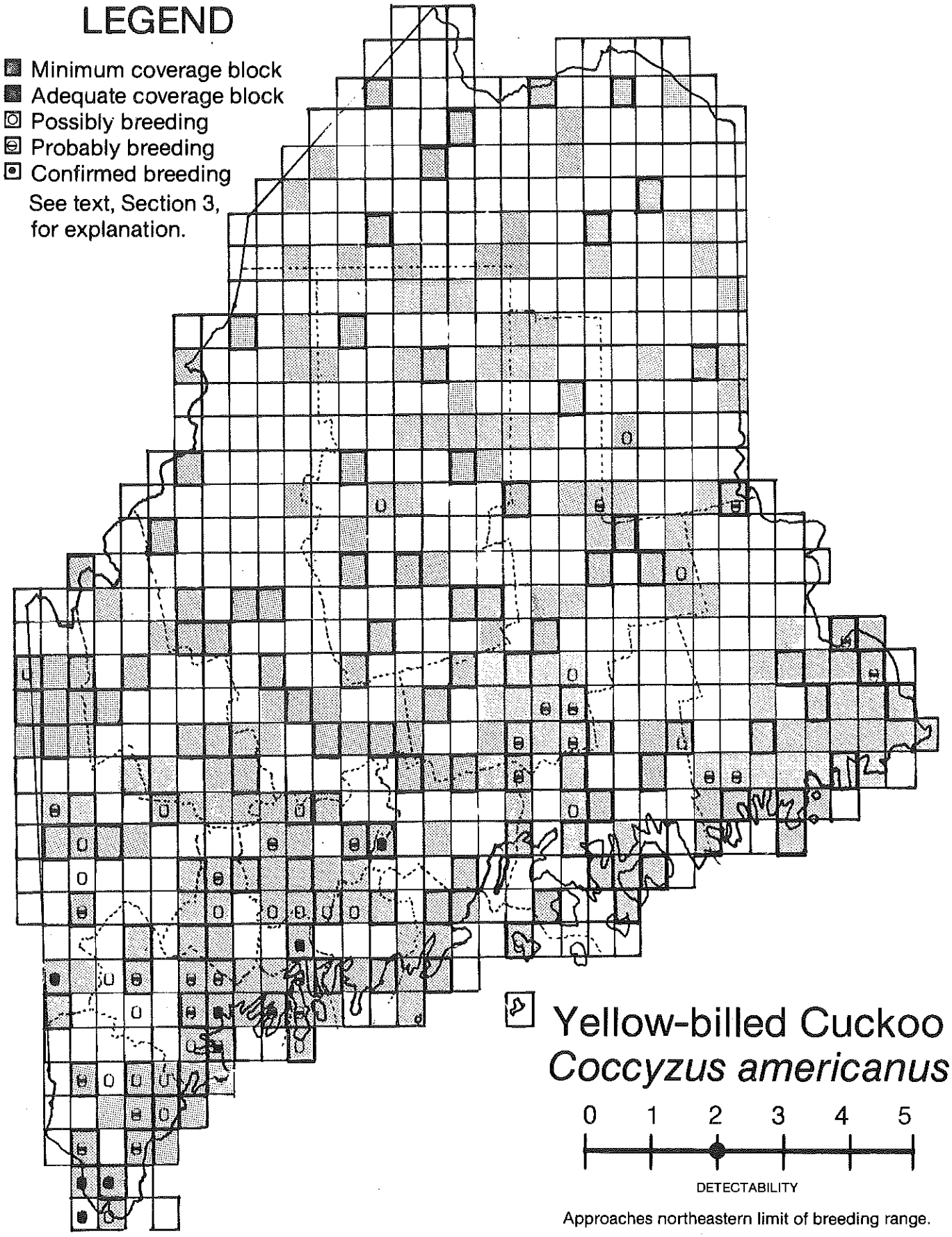

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Rock Dove
Columba livia
0 1 2 3 4 5
DETECTABILITY

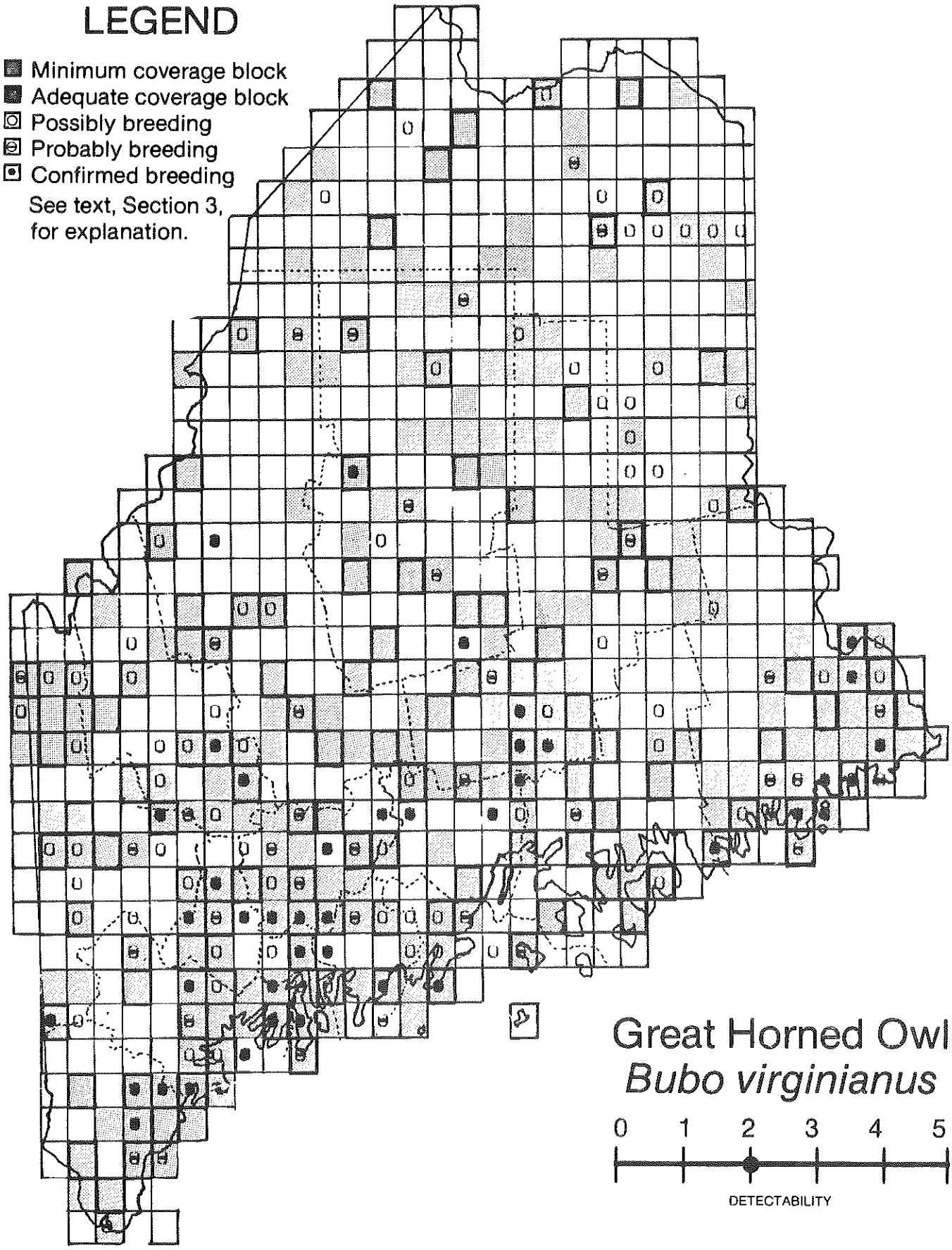


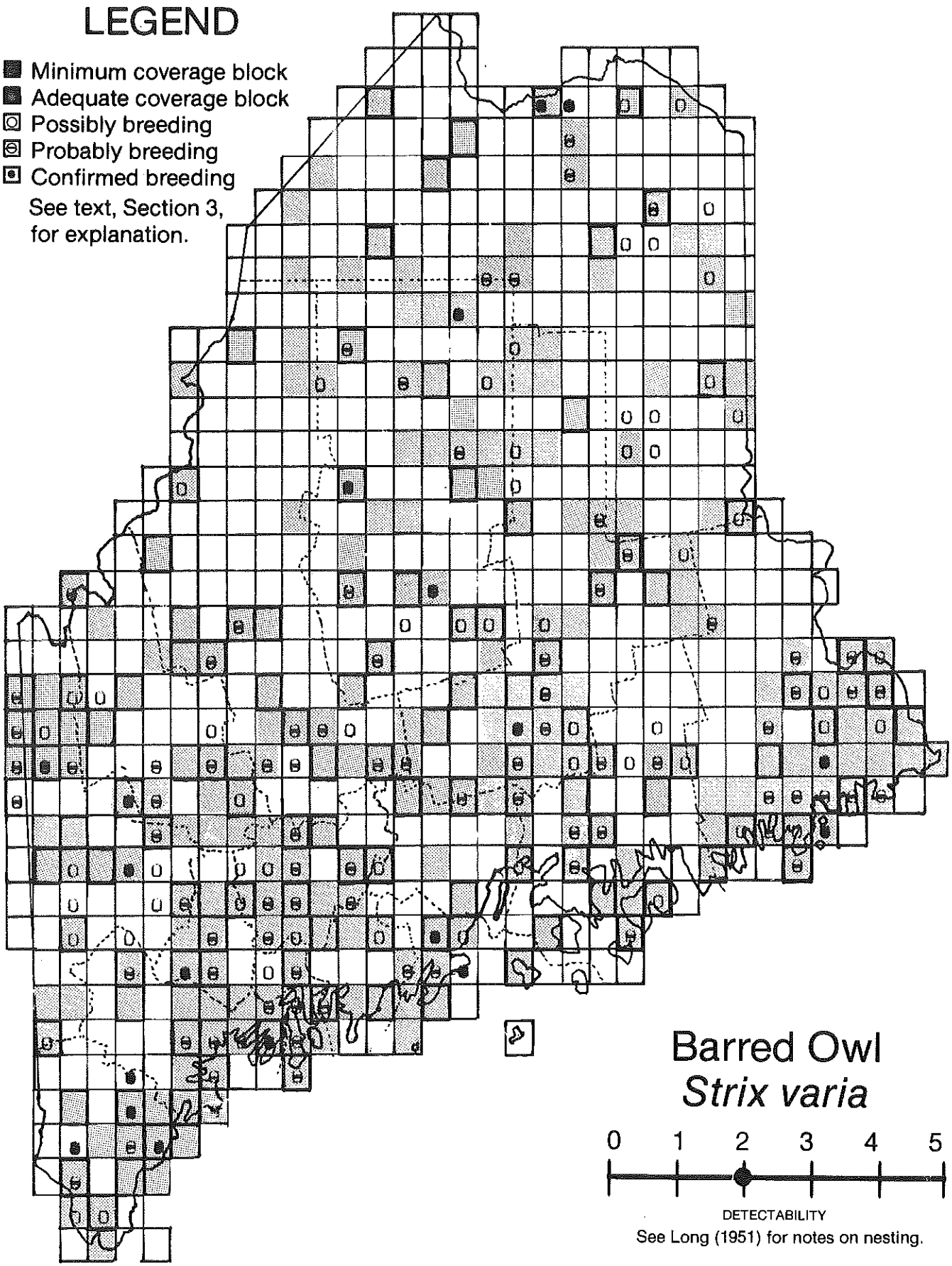
Range has expanded considerably in recent years. Data from MDIFW-USFWS survey routes are included.

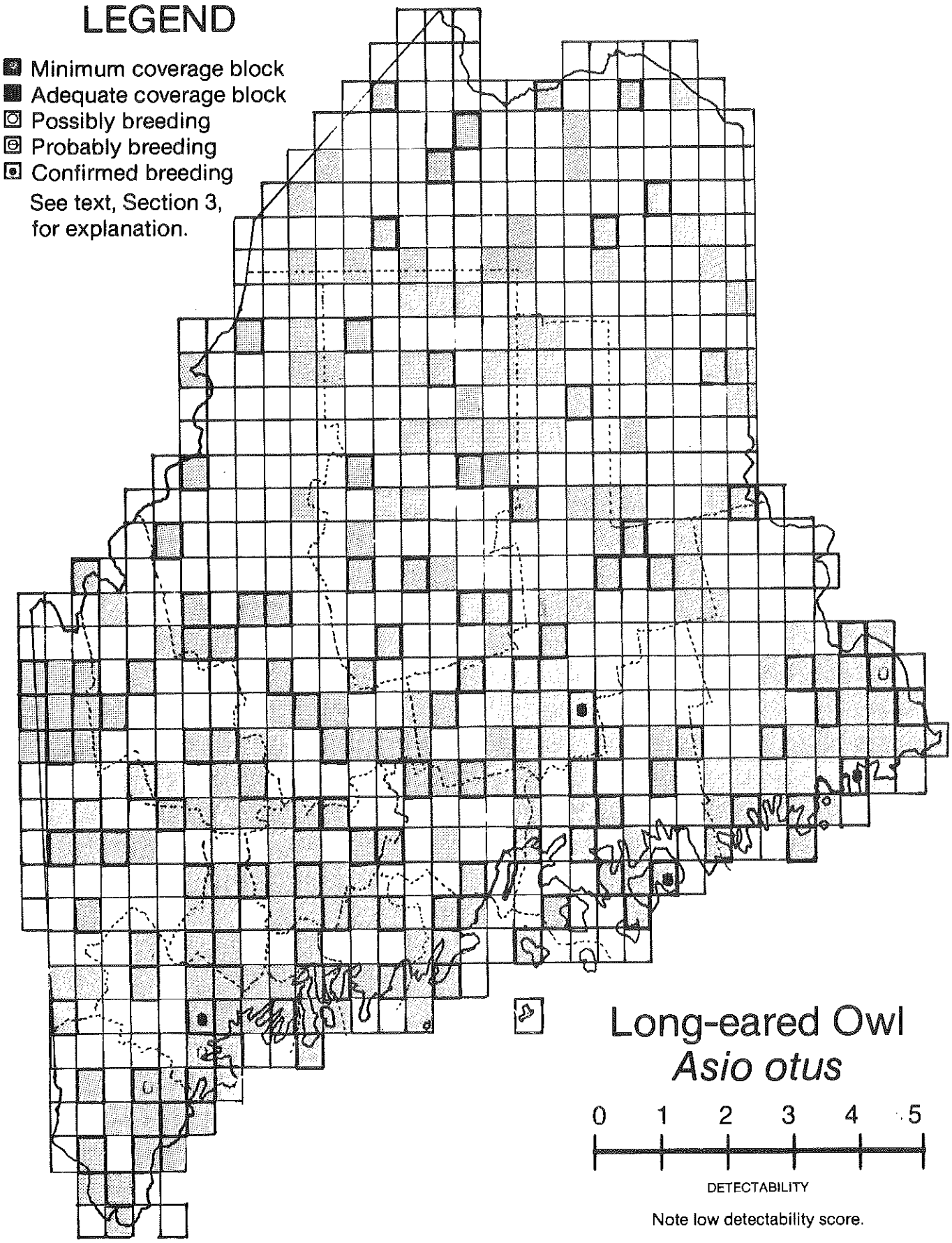


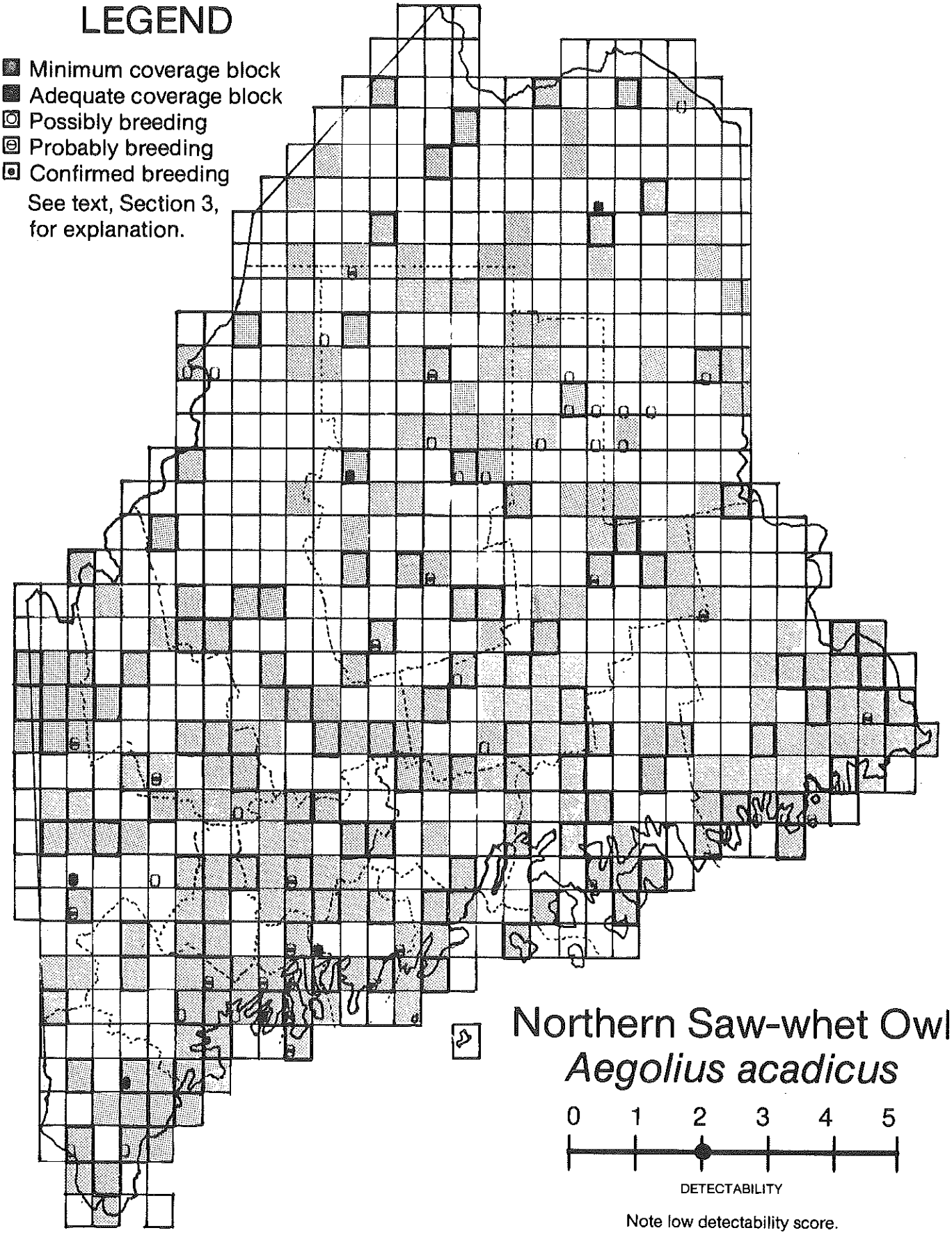
Less regular in the northwestern part of the state.

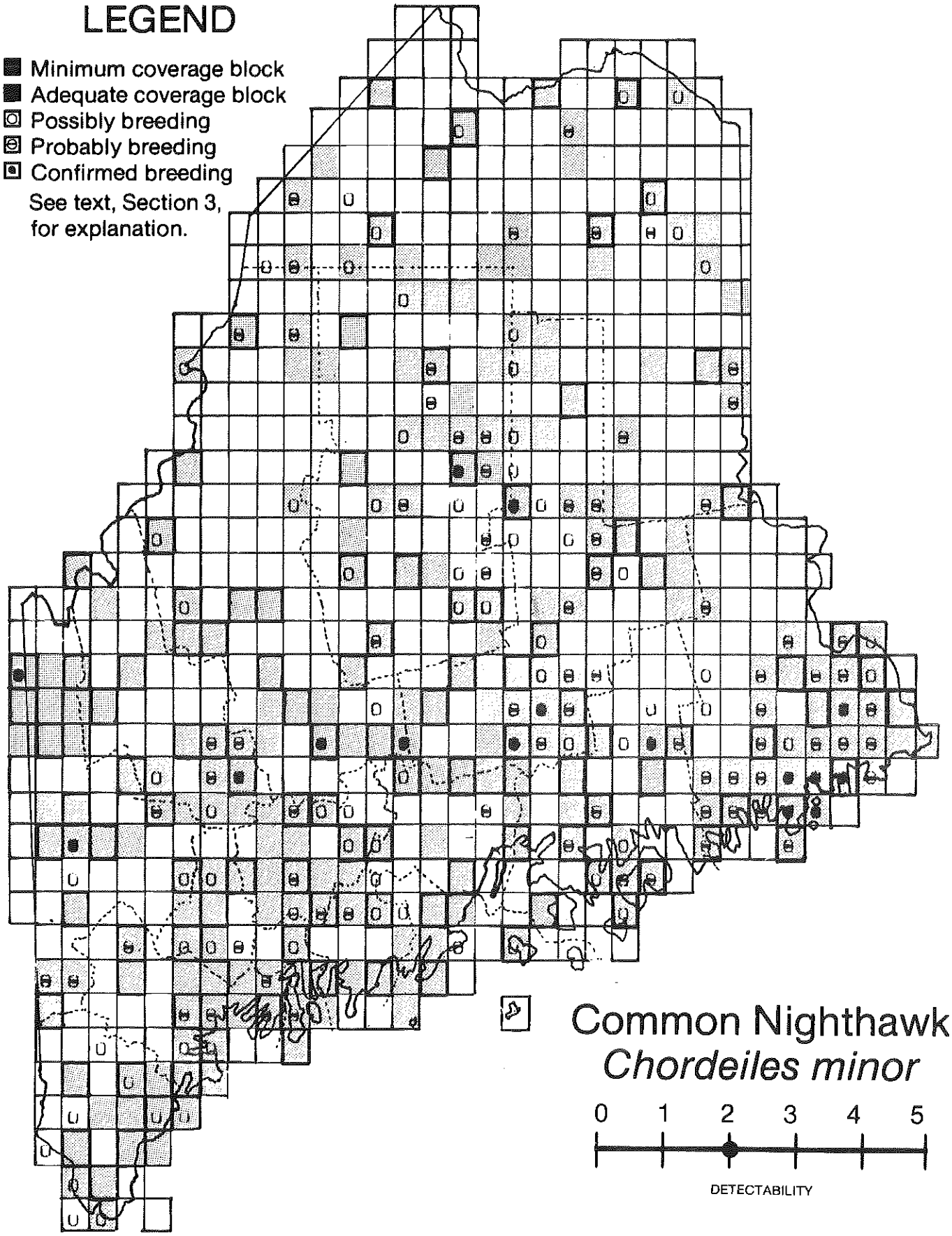

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Yellow-billed Cuckoo
Coccyzus americanus
0 1 2 3 4 5
DETECTABILITY
Approaches northeastern limit of breeding range.

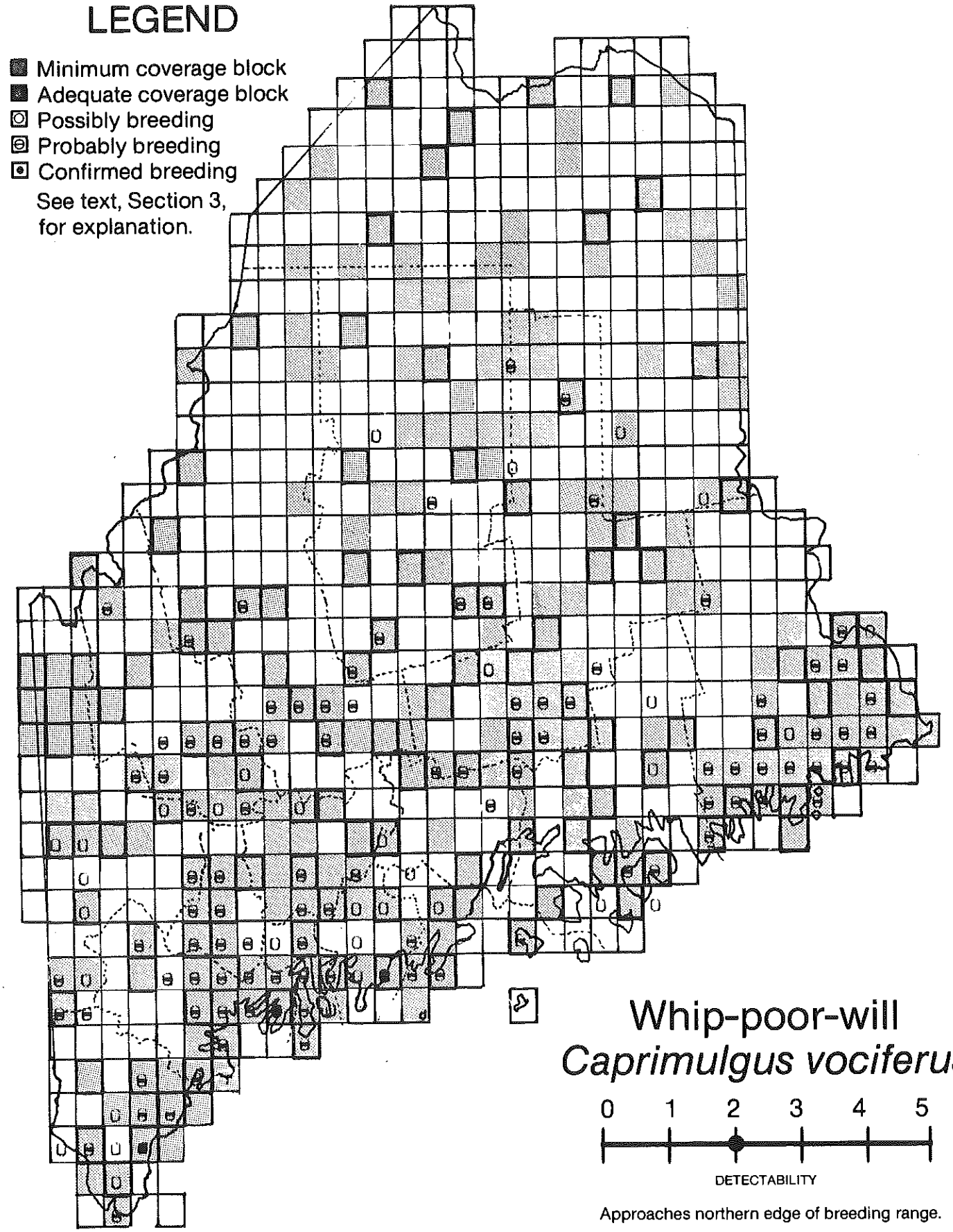

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Great Horned Owl
Bubo virginianus
0 1 2 3 4 5
DETECTABILITY


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Barred Owl
Strix varia
0 1 2 3 4 5
DETECTABILITY
See Long (1951) for notes on nesting.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Long-eared Owl
Asio otus
0 1 2 3 4 5
DETECTABILITY
Note low detectability score.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Northern Saw-whet Owl
Aegolius acadicus
0 1 2 3 4 5
DETECTABILITY
Note low detectability score.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Common Nighthawk
Chordeiles minor
0 1 2 3 4 5
DETECTABILITY

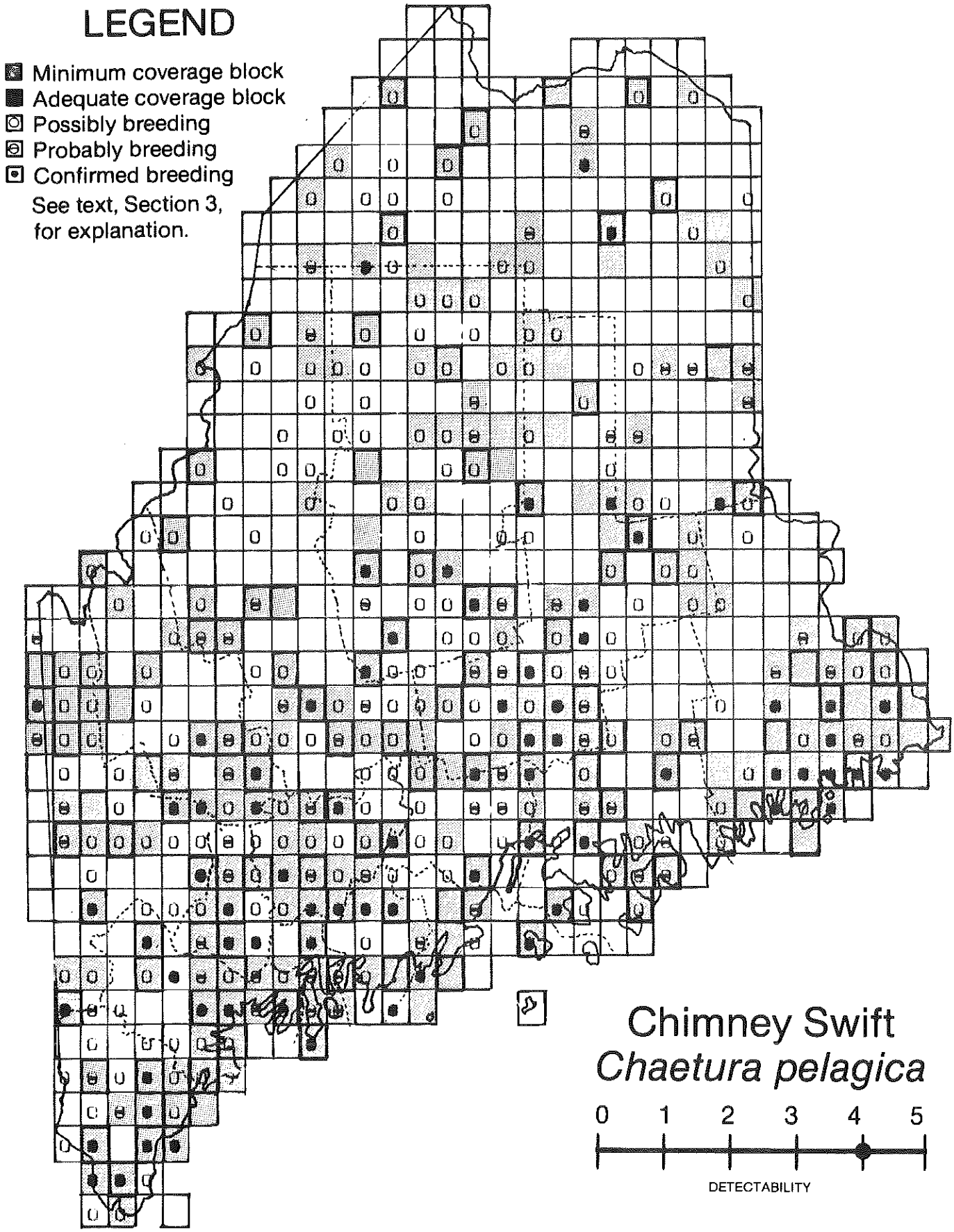


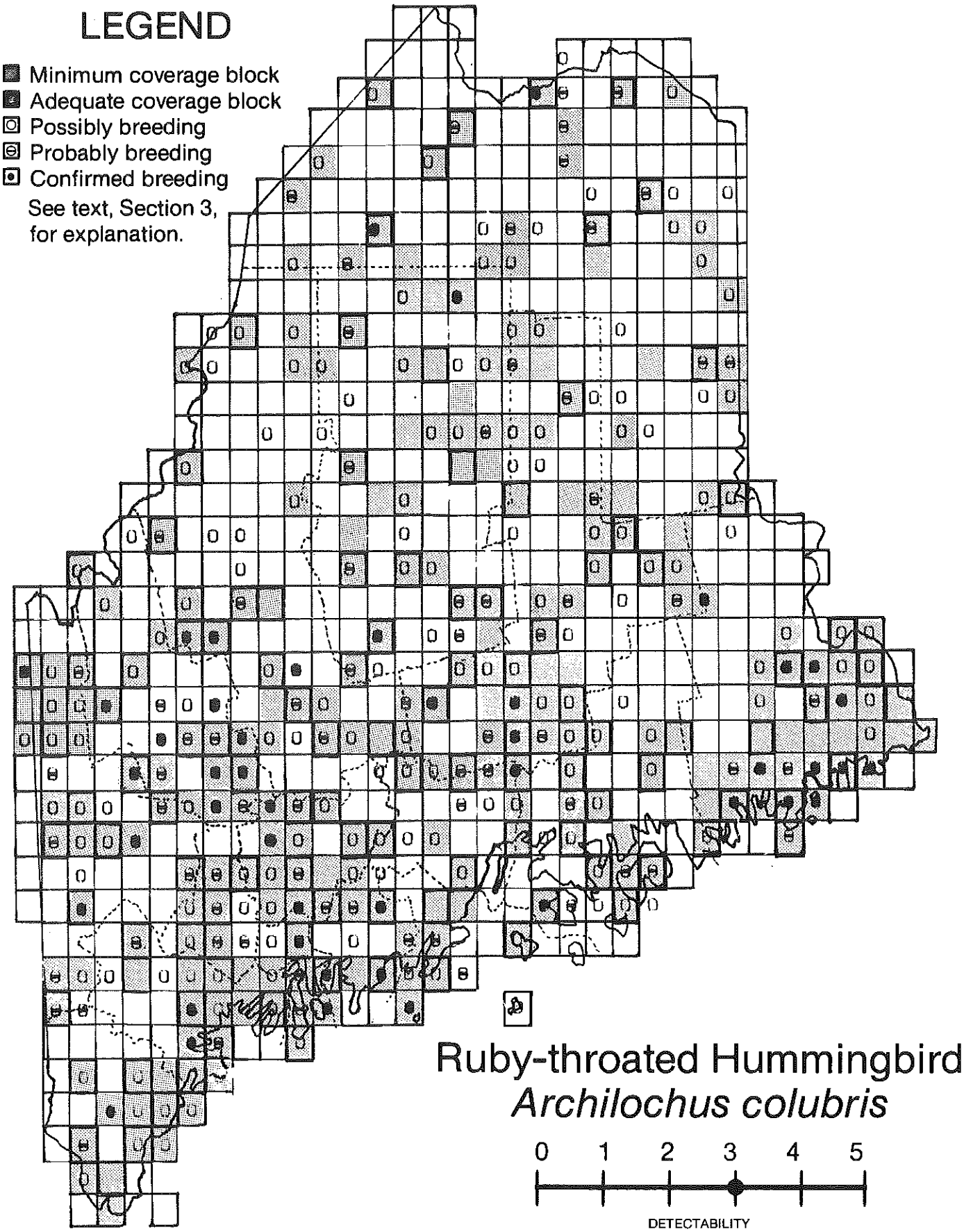
Whip-poor-will
Caprimulgus vociferus

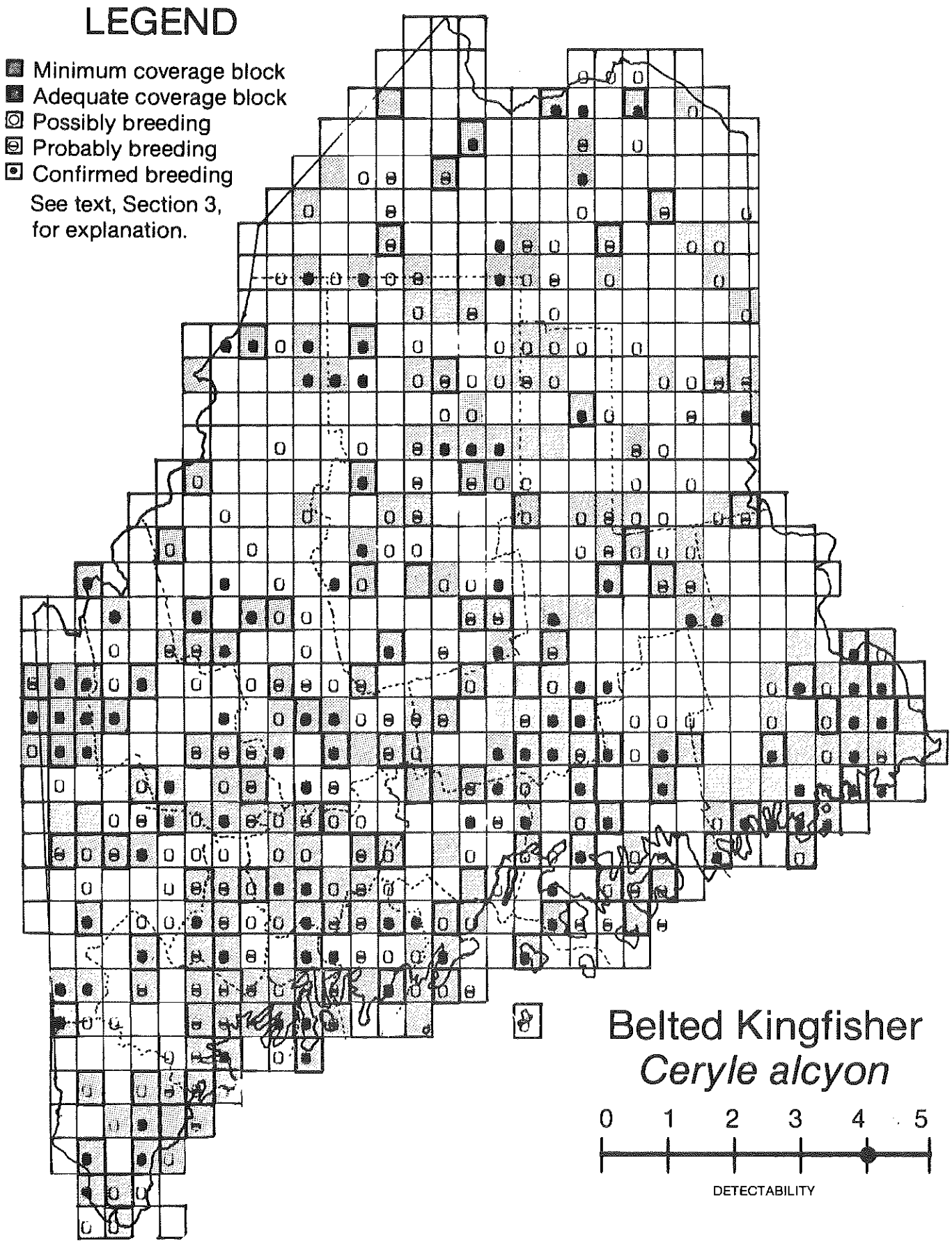
0 1 2 3 4 5

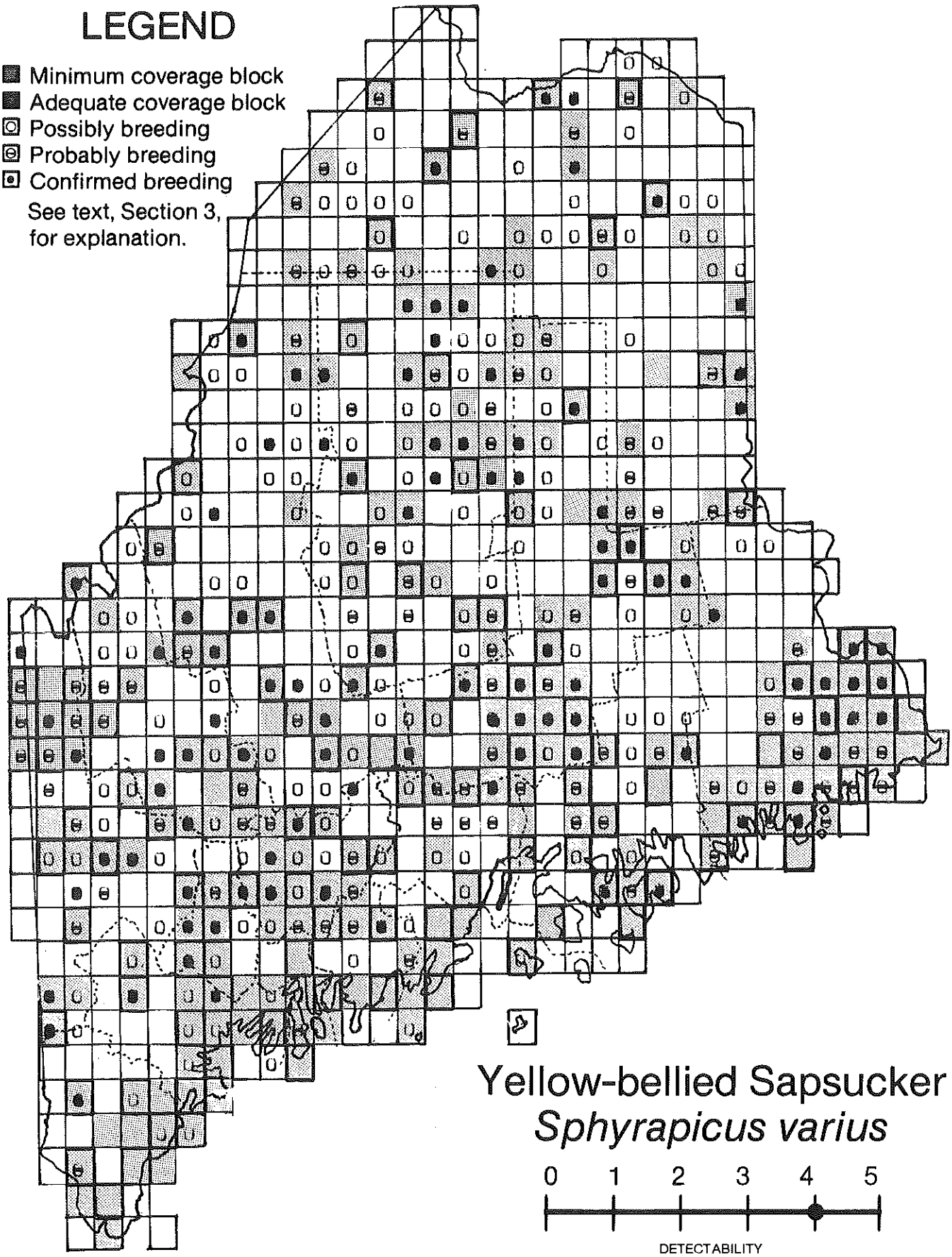
DETECTABILITY

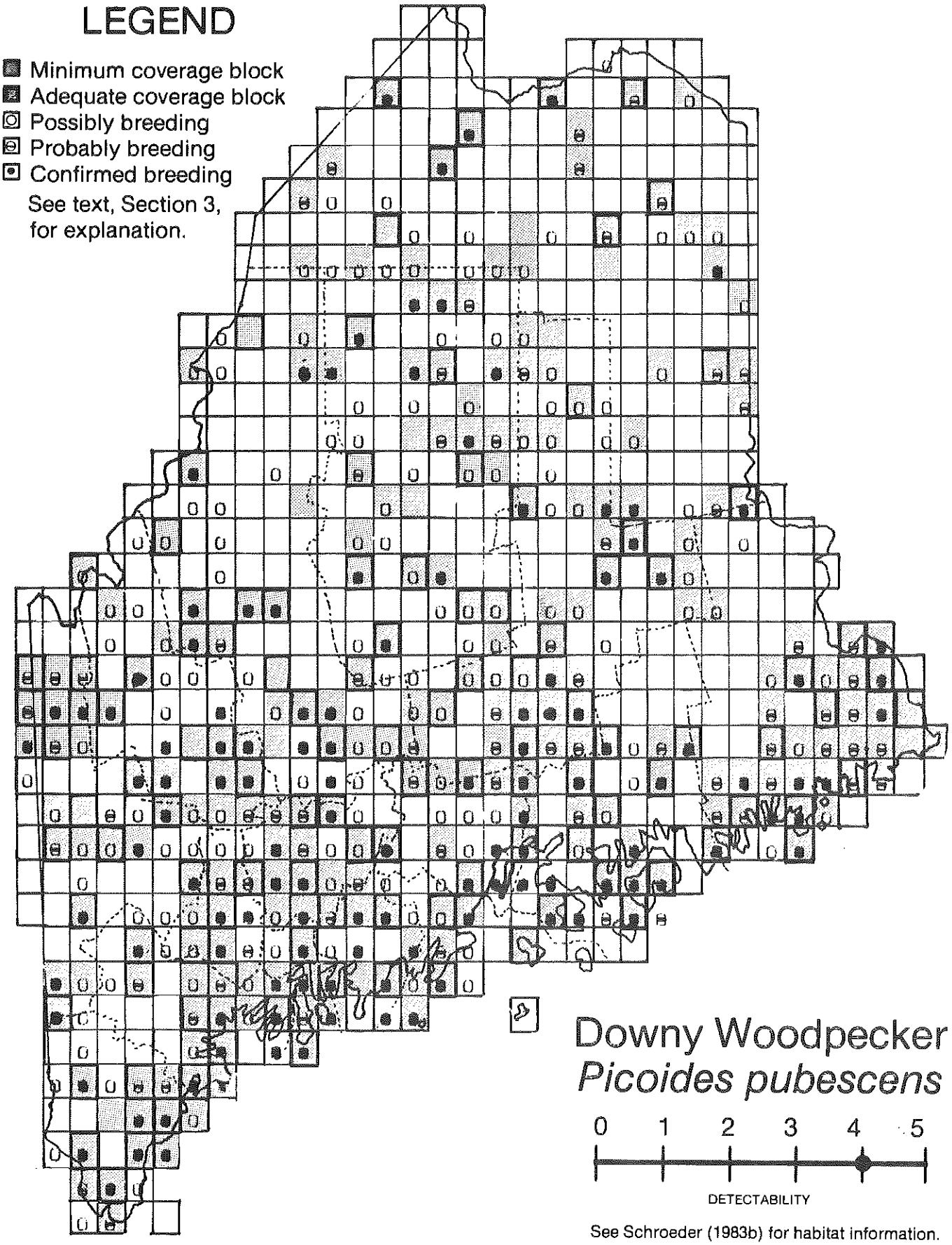
Approaches northern edge of breeding range.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Chimney Swift
Chaetura pelagica
0 1 2 3 4 5
DETECTABILITY

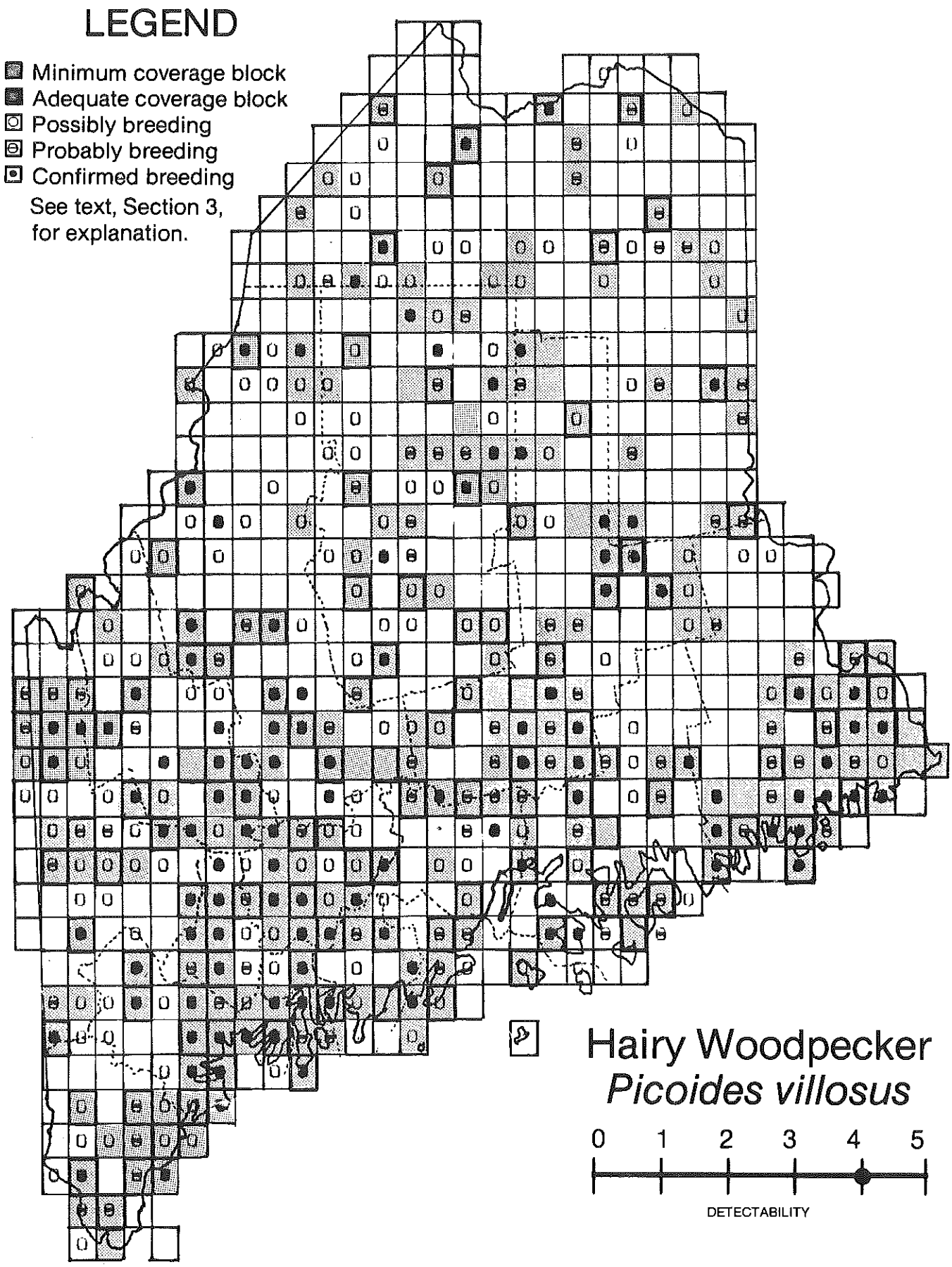

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Ruby-throated Hummingbird
Archilochus colubris
0 1 2 3 4 5
DETECTABILITY

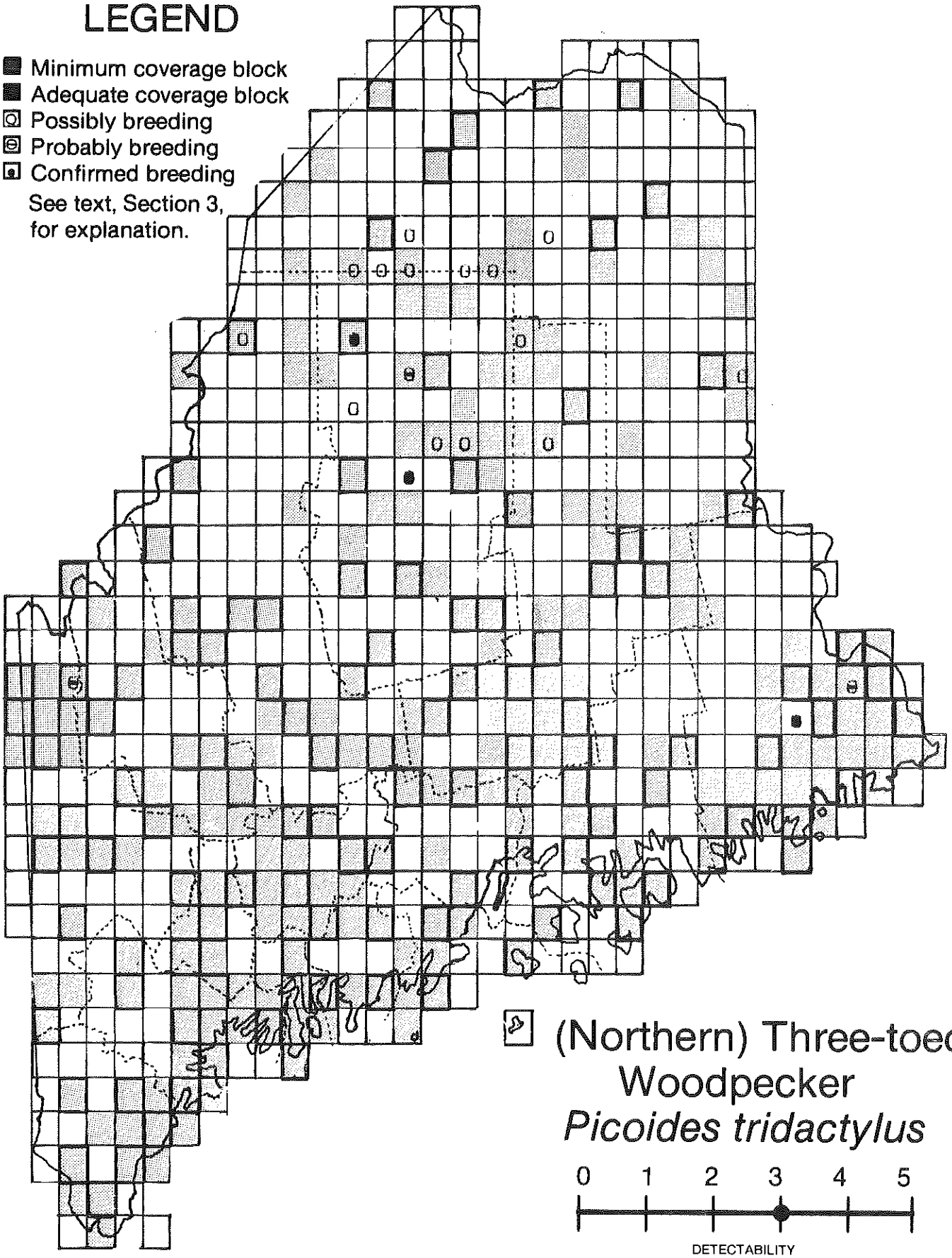

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Belted Kingfisher
Ceryle alcyon
0 1 2 3 4 5
DETECTABILITY


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Yellow-bellied Sapsucker
Sphyrapicus varius
0 1 2 3 4 5
DETECTABILITY



See Schroeder (1983b) for habitat information.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Hairy Woodpecker
Picoides villosus
0 1 2 3 4 5
DETECTABILITY

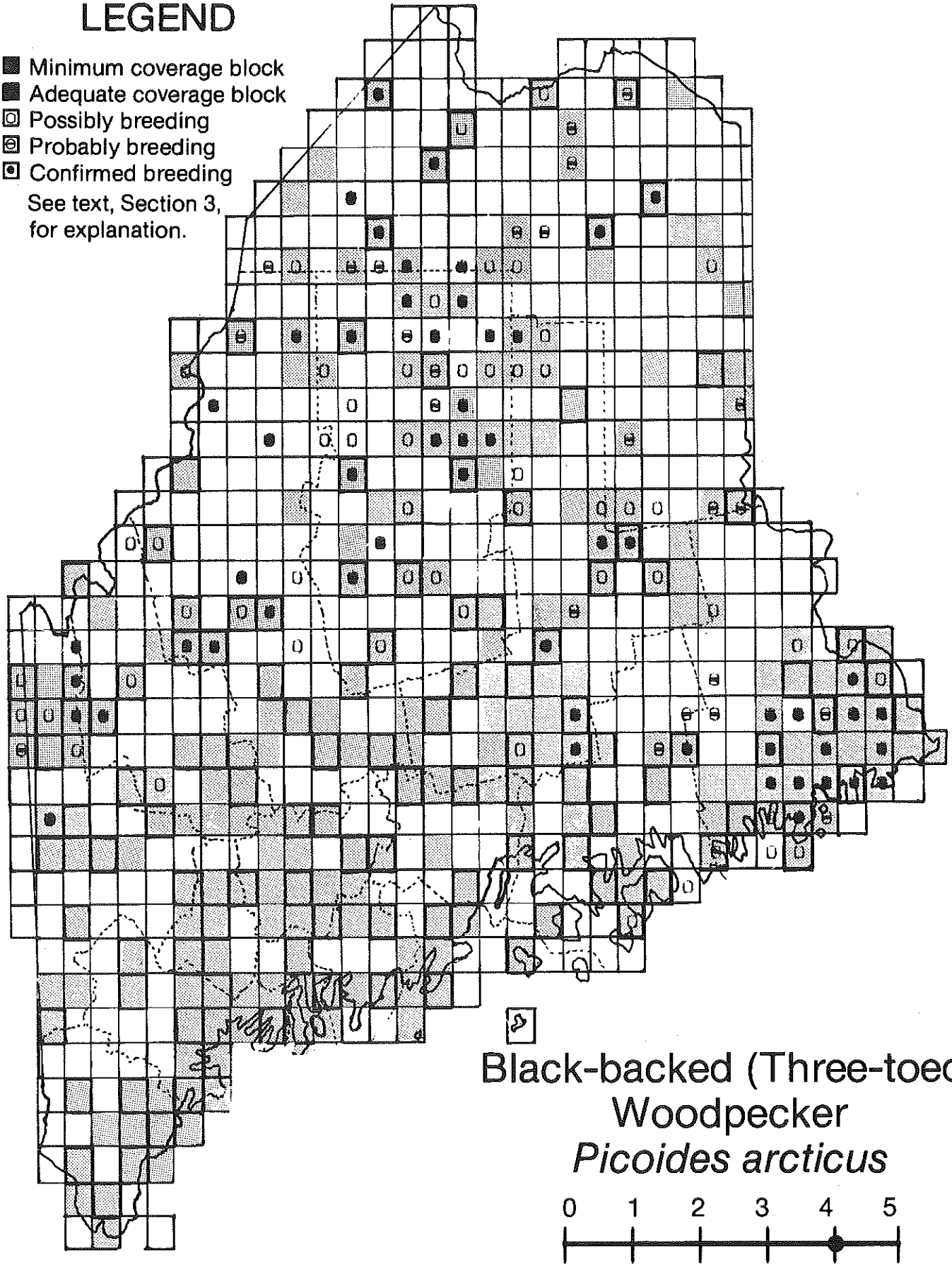


(Northern) Three-toed Woodpecker
Picoides tridactylus

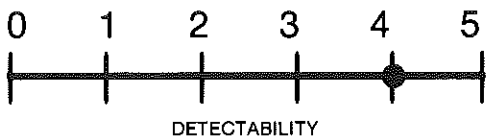
0 1 2 3 4 5

DETECTABILITY

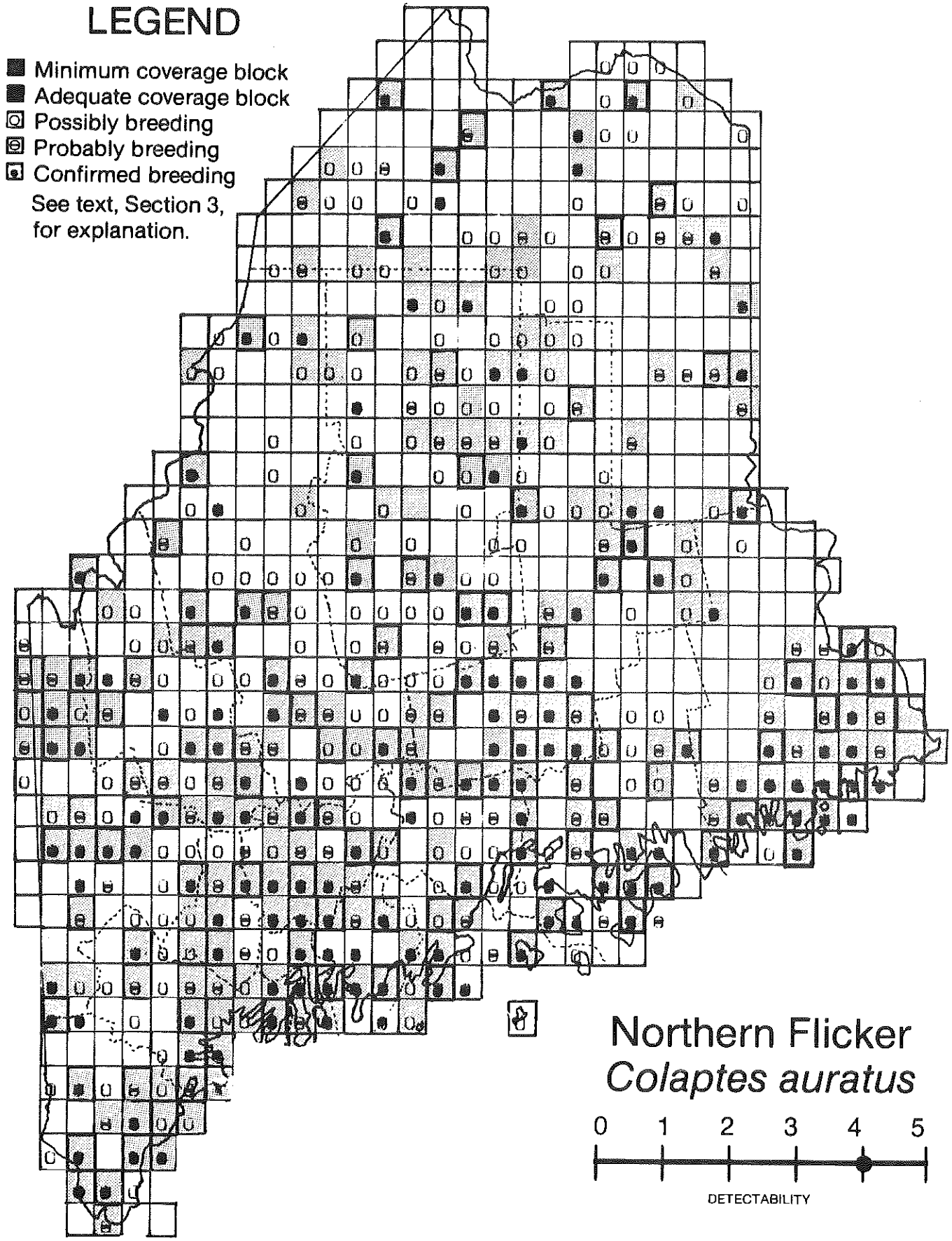
Reaches southern limit of breeding range in the spruce-fir regions of the state.

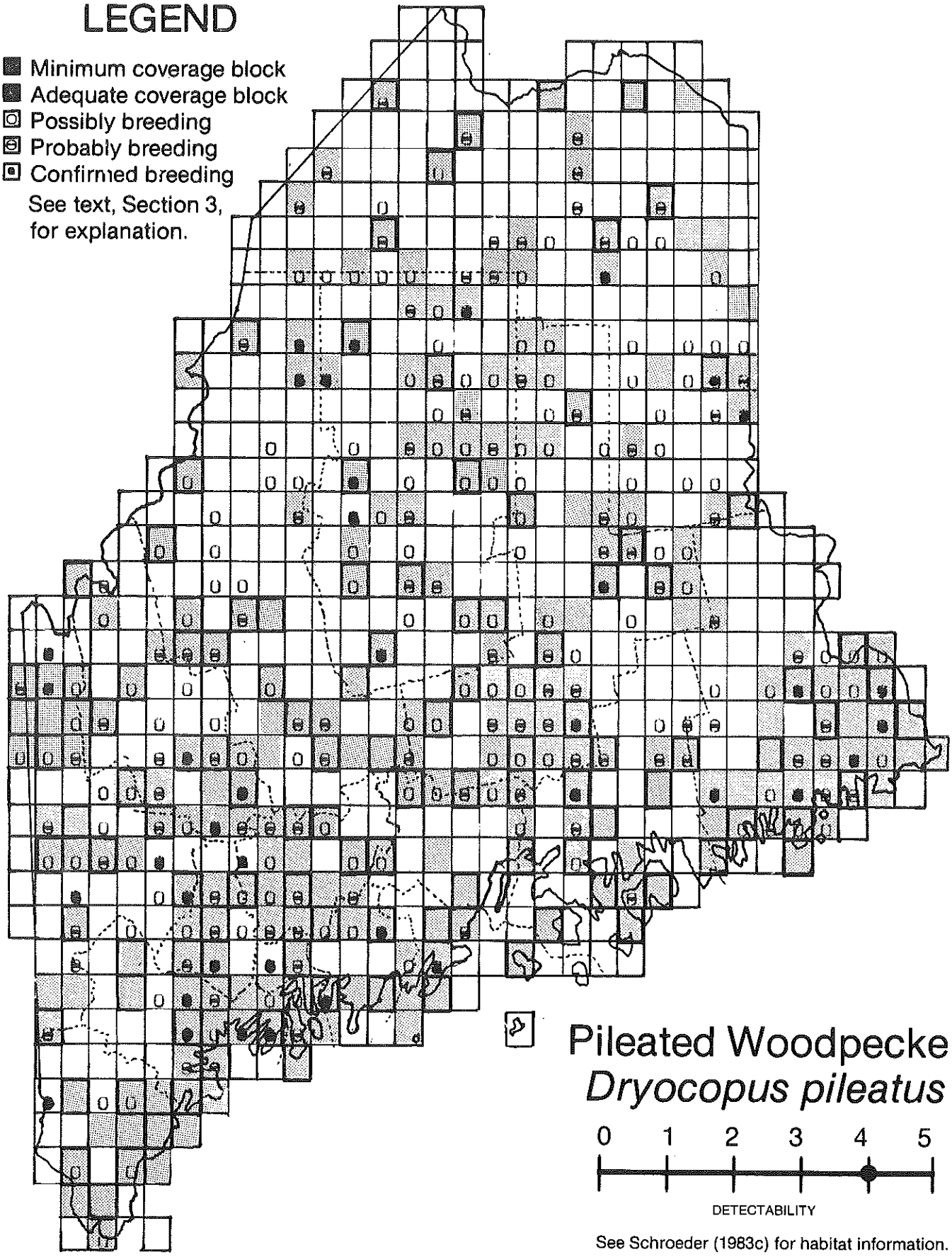


Black-backed (Three-toed) Woodpecker
Picoides arcticus

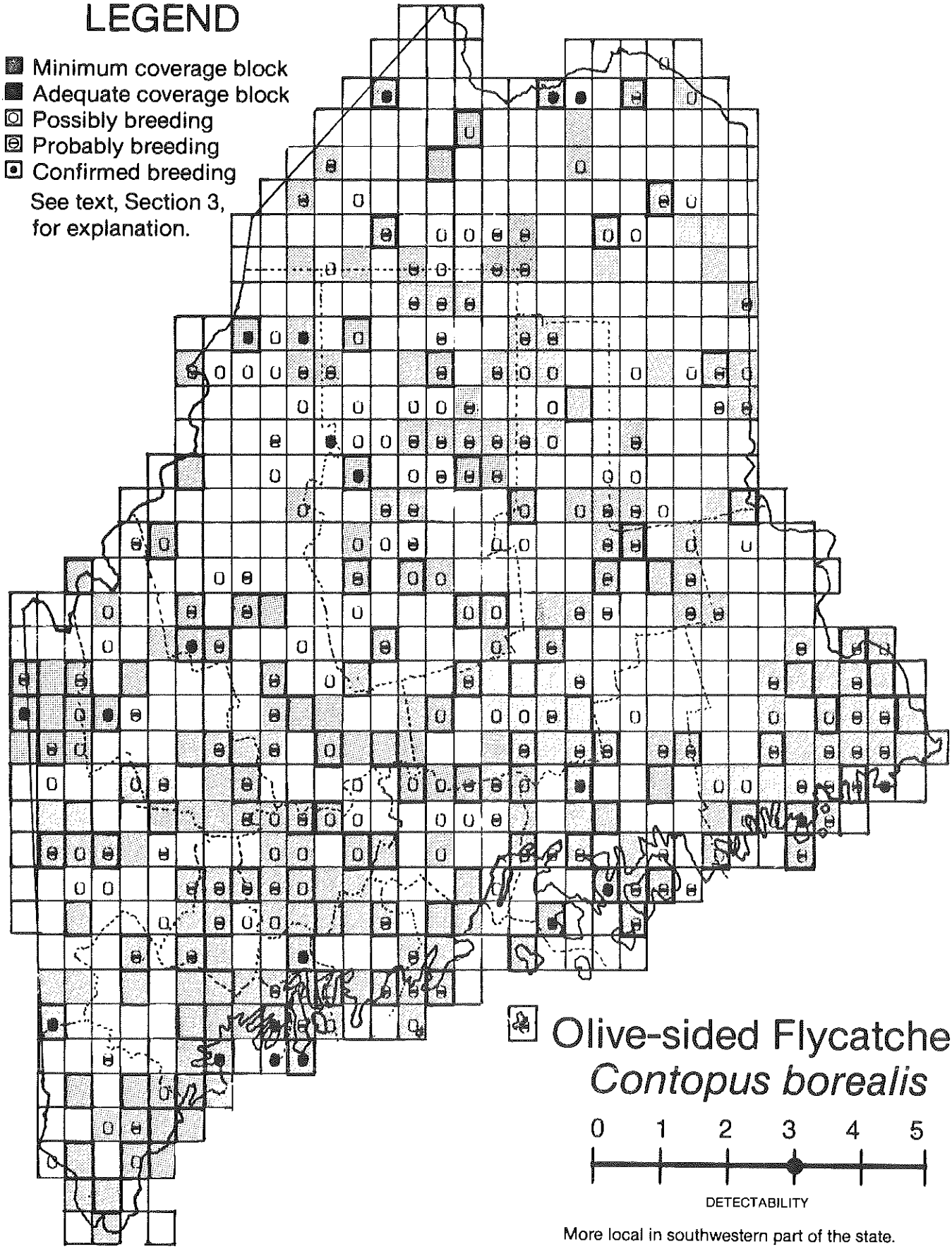


Reaches southern limit of breeding range in the spruce-fir regions of the state. See Taber (1951).

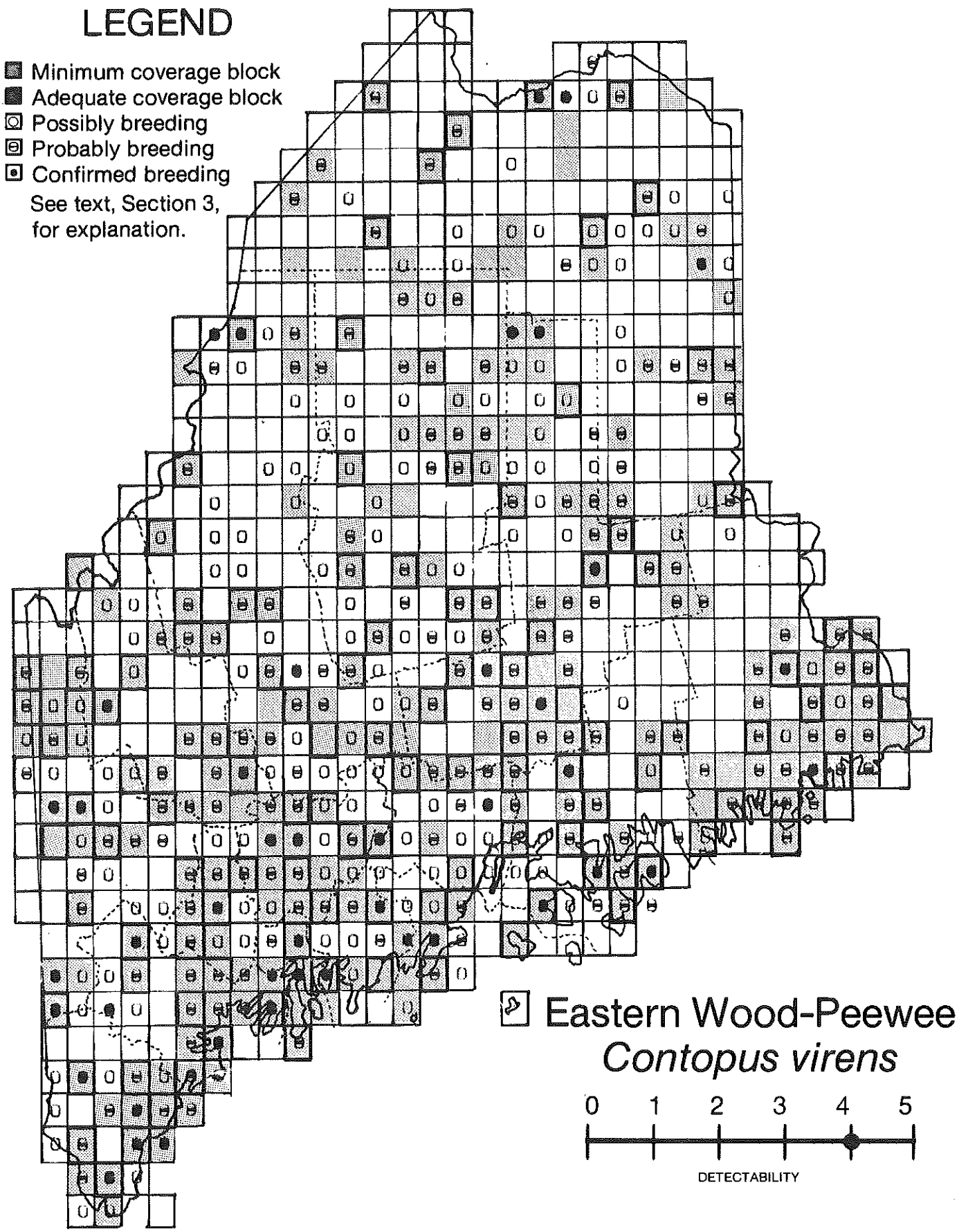

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Northern Flicker
Colaptes auratus
0 1 2 3 4 5
DETECTABILITY

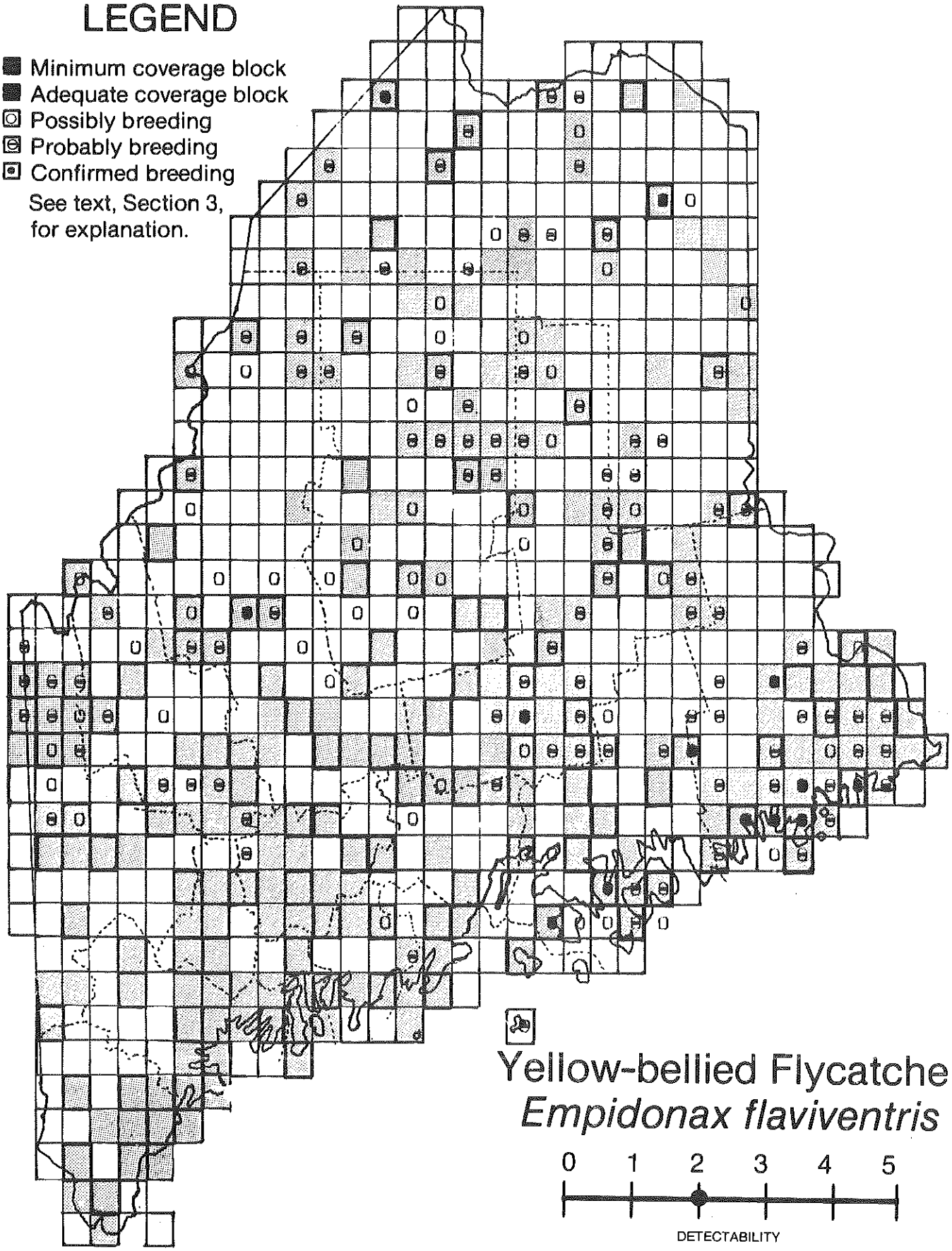


See Schroeder (1983c) for habitat information.

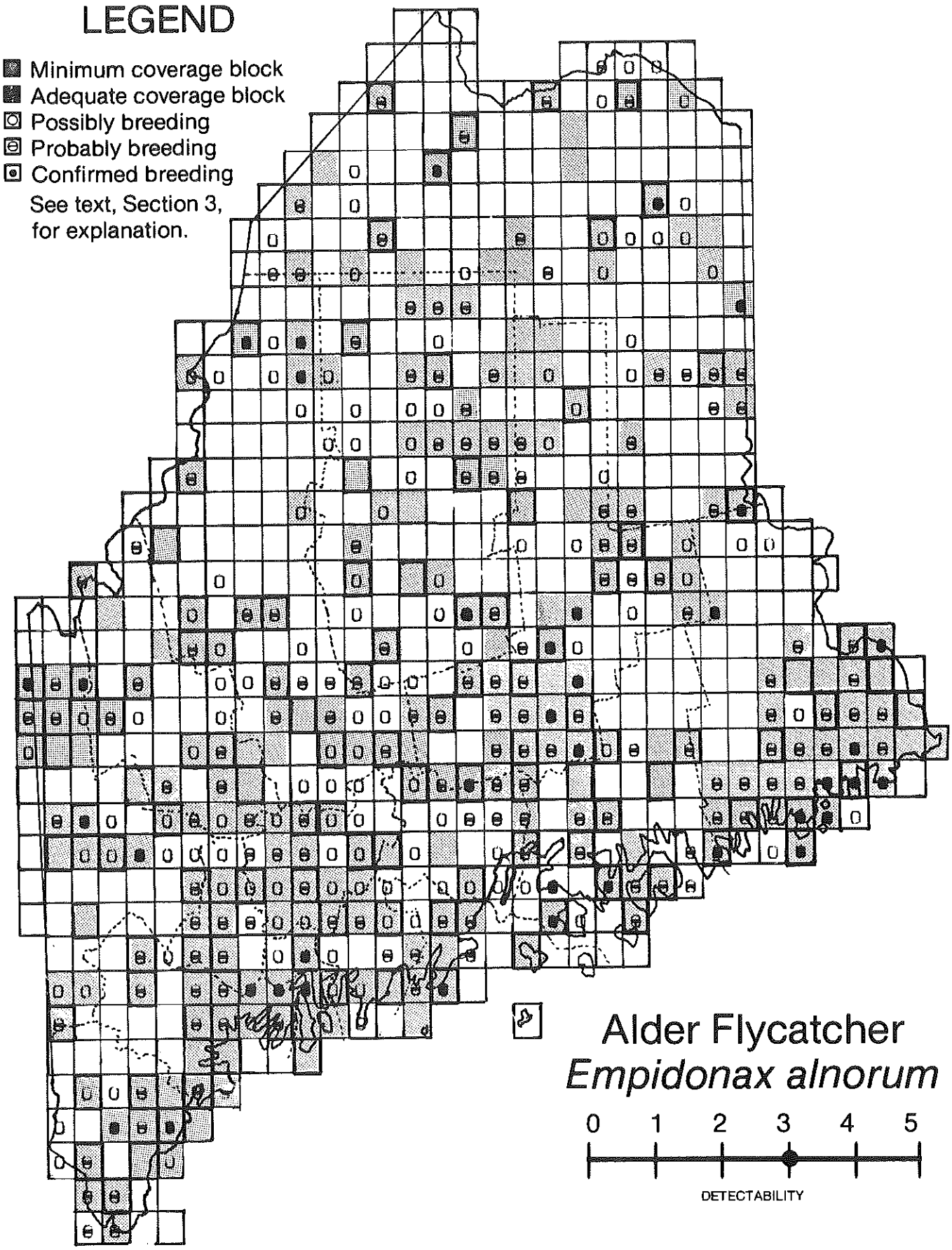


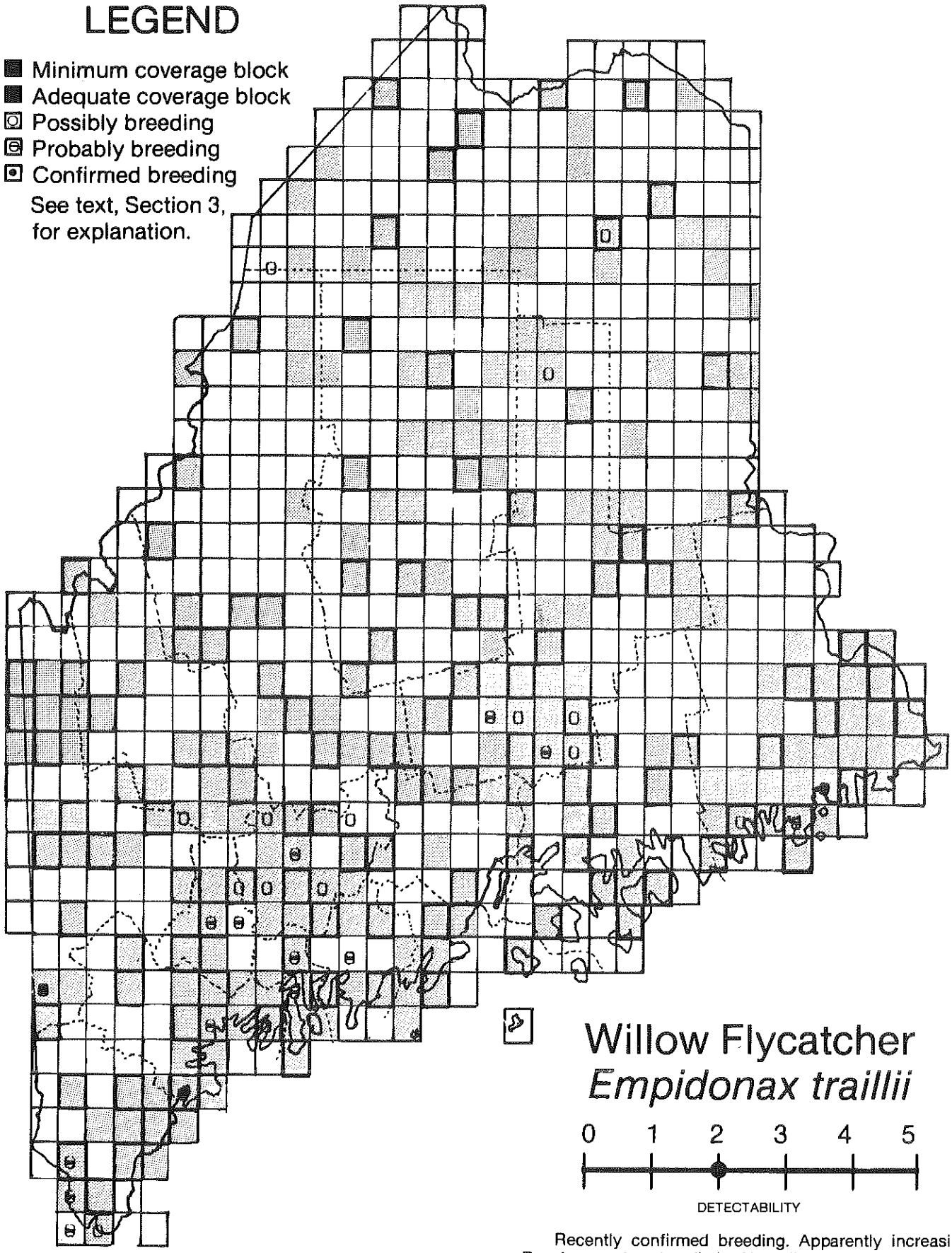
More local in southwestern part of the state.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Eastern Wood-Peewee
Contopus virens
0 1 2 3 4 5
DETECTABILITY

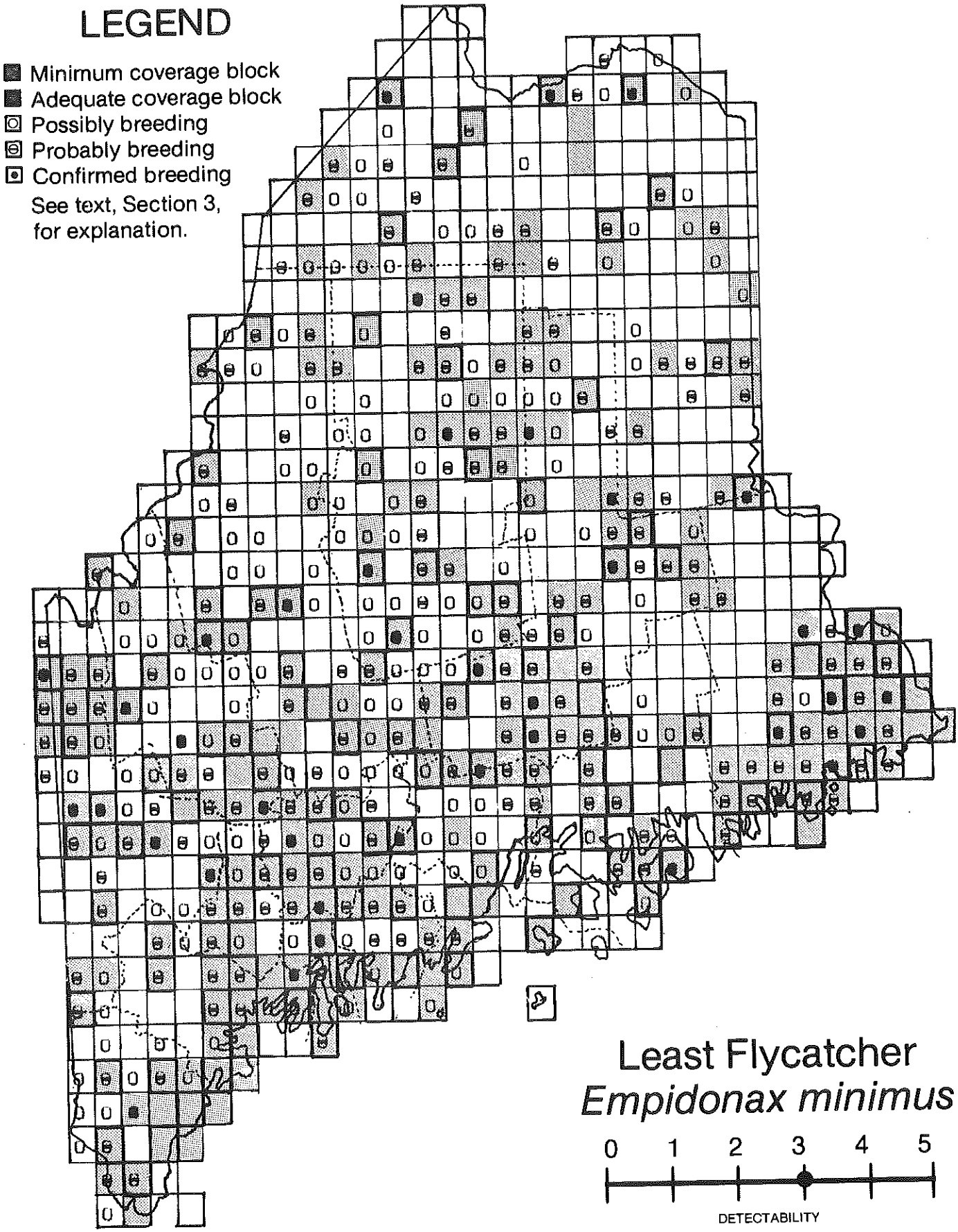


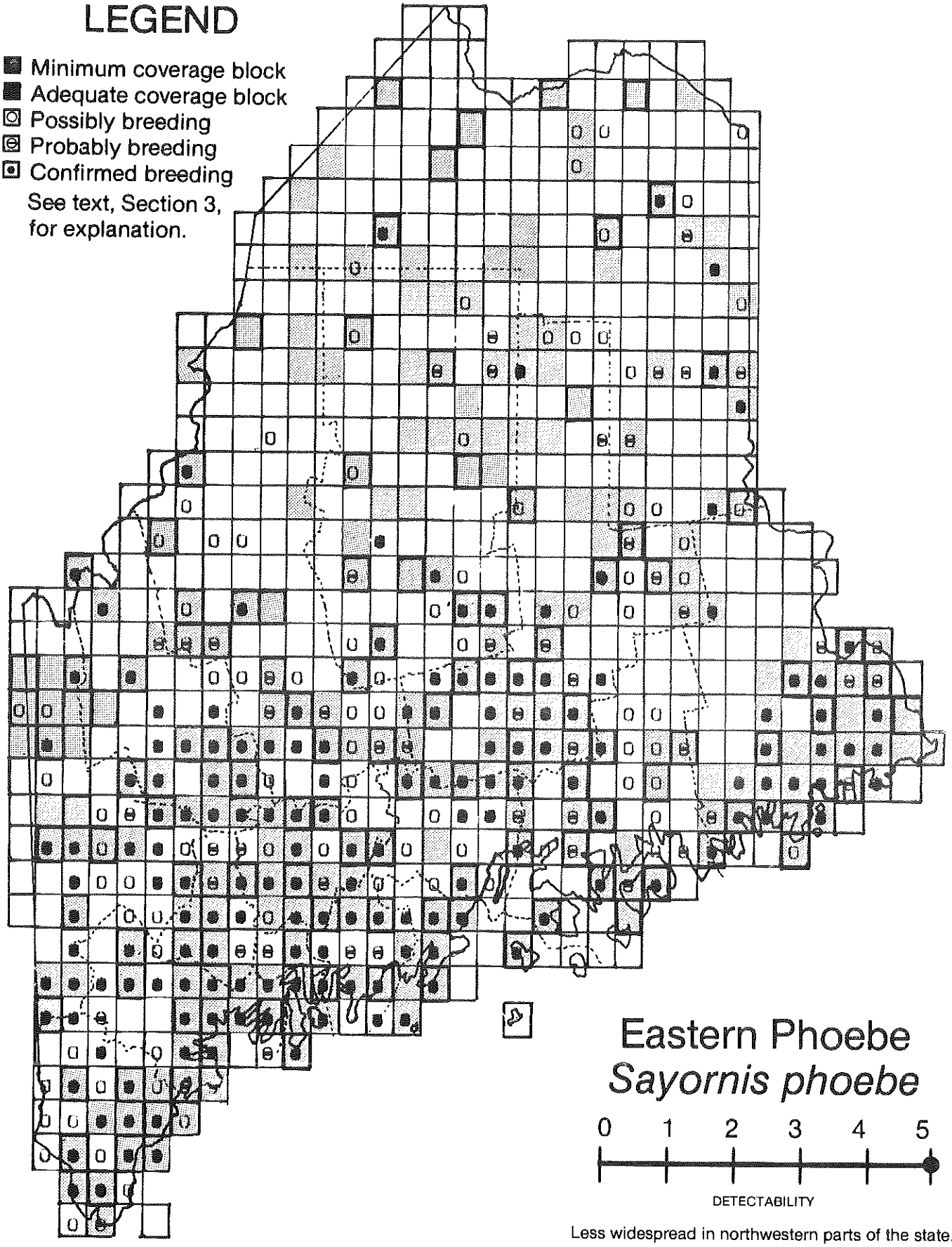
Reaches southern limit of breeding range.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Alder Flycatcher
Empidonax alnorum
0 1 2 3 4 5
DETECTABILITY

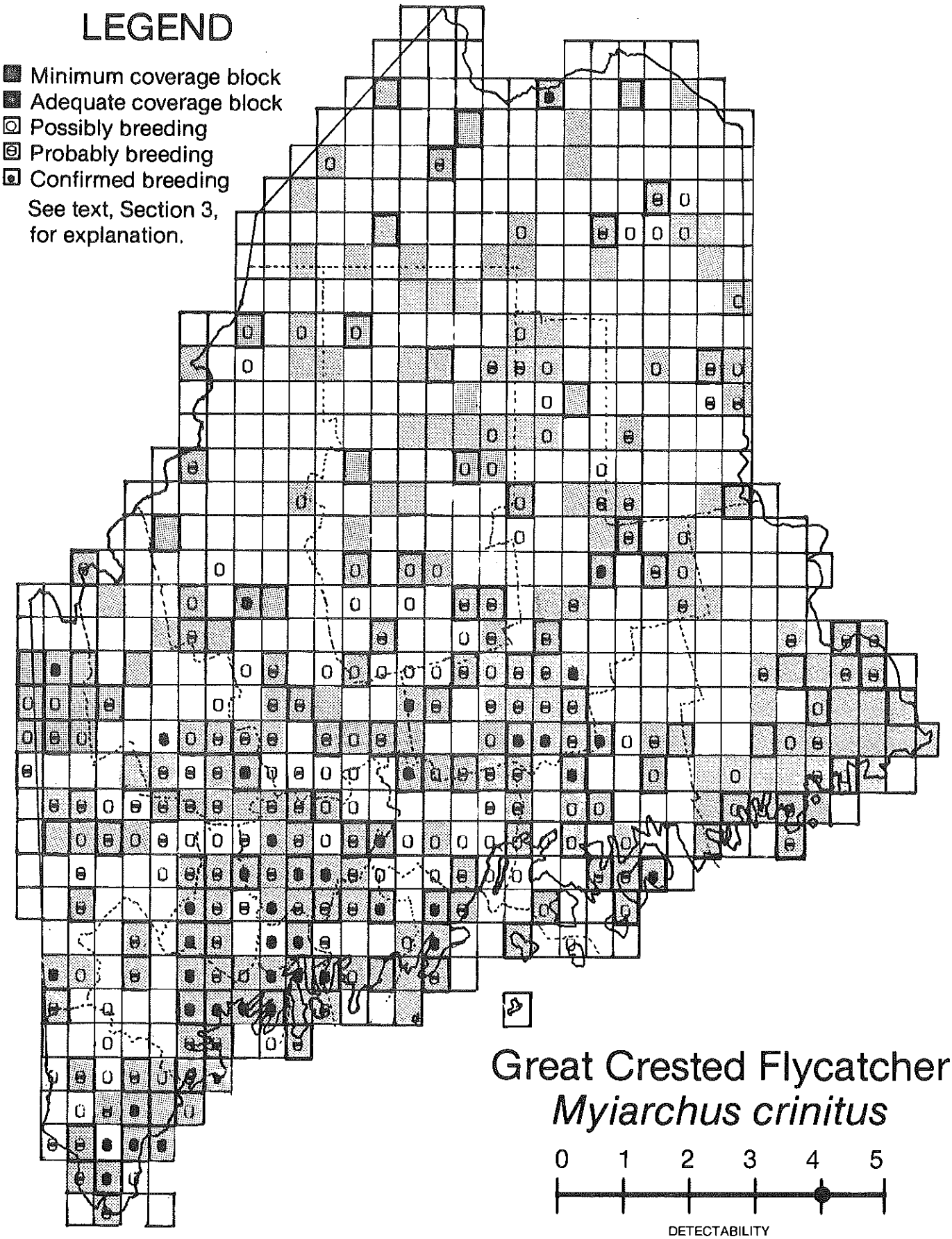


Recently confirmed breeding. Apparently increasing. Reaches northeastern limit of breeding range.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Least Flycatcher
Empidonax minimus
0 1 2 3 4 5
DETECTABILITY

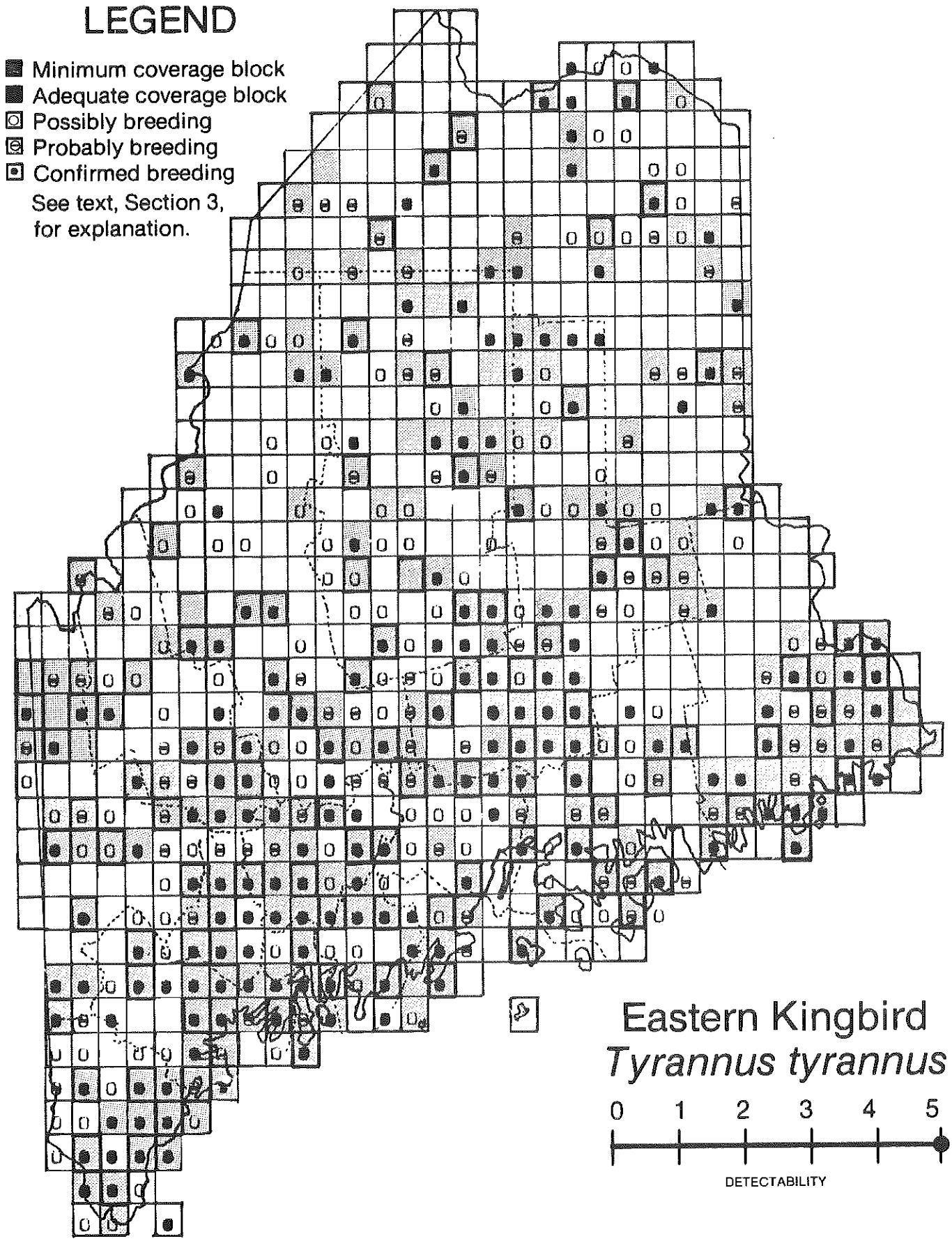


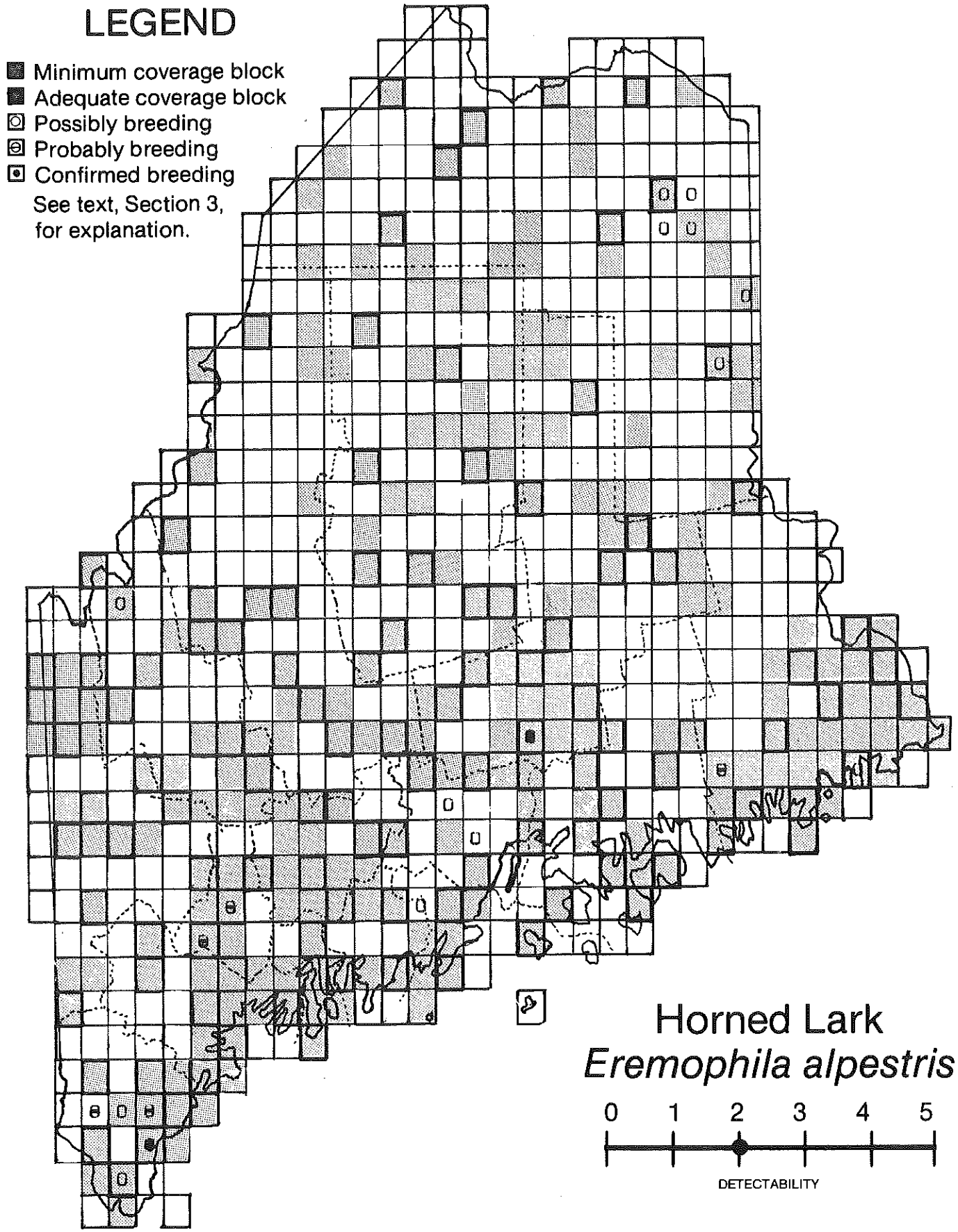
Less widespread in northwestern parts of the state.

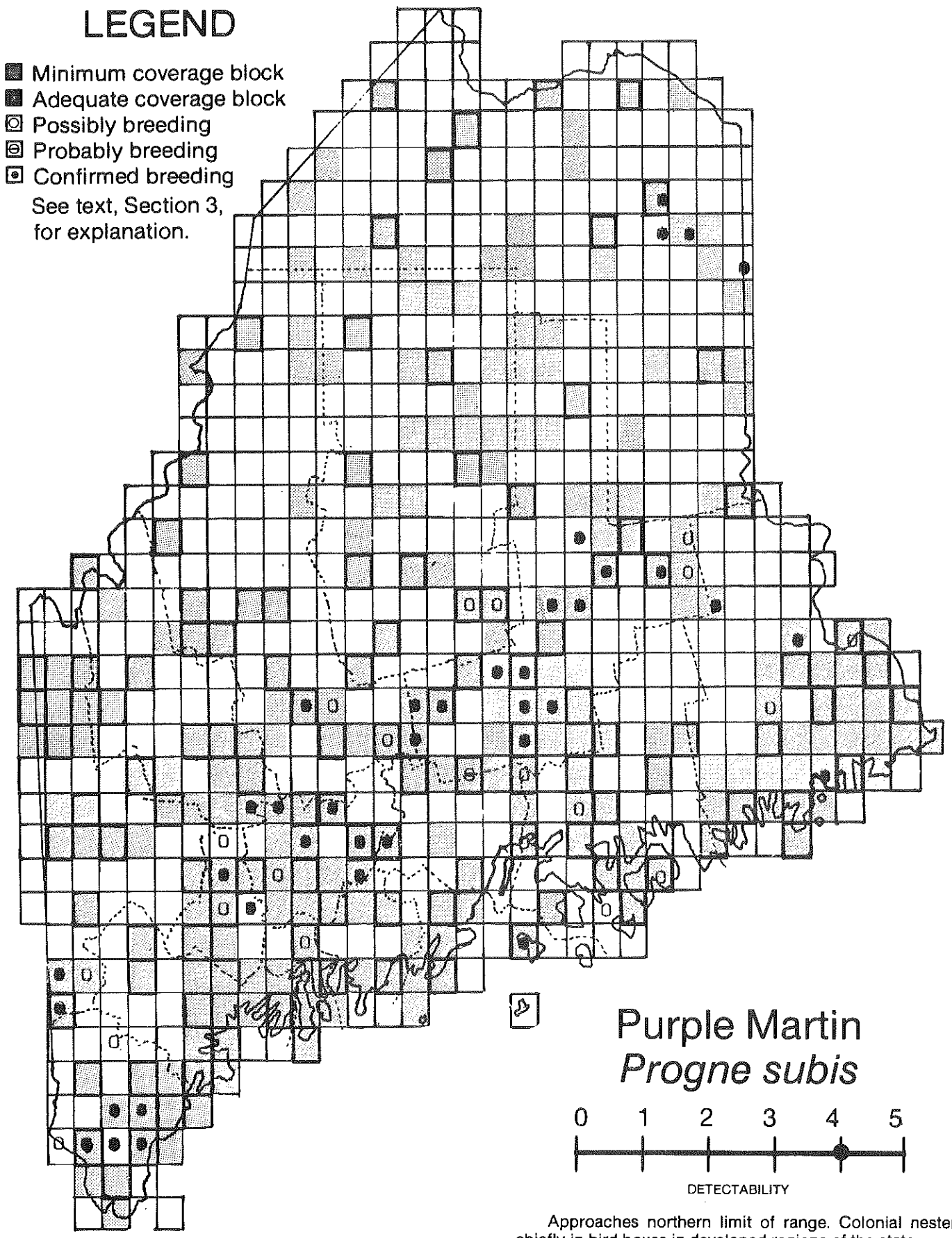


Great Crested Flycatcher
Myiarchus crinitus

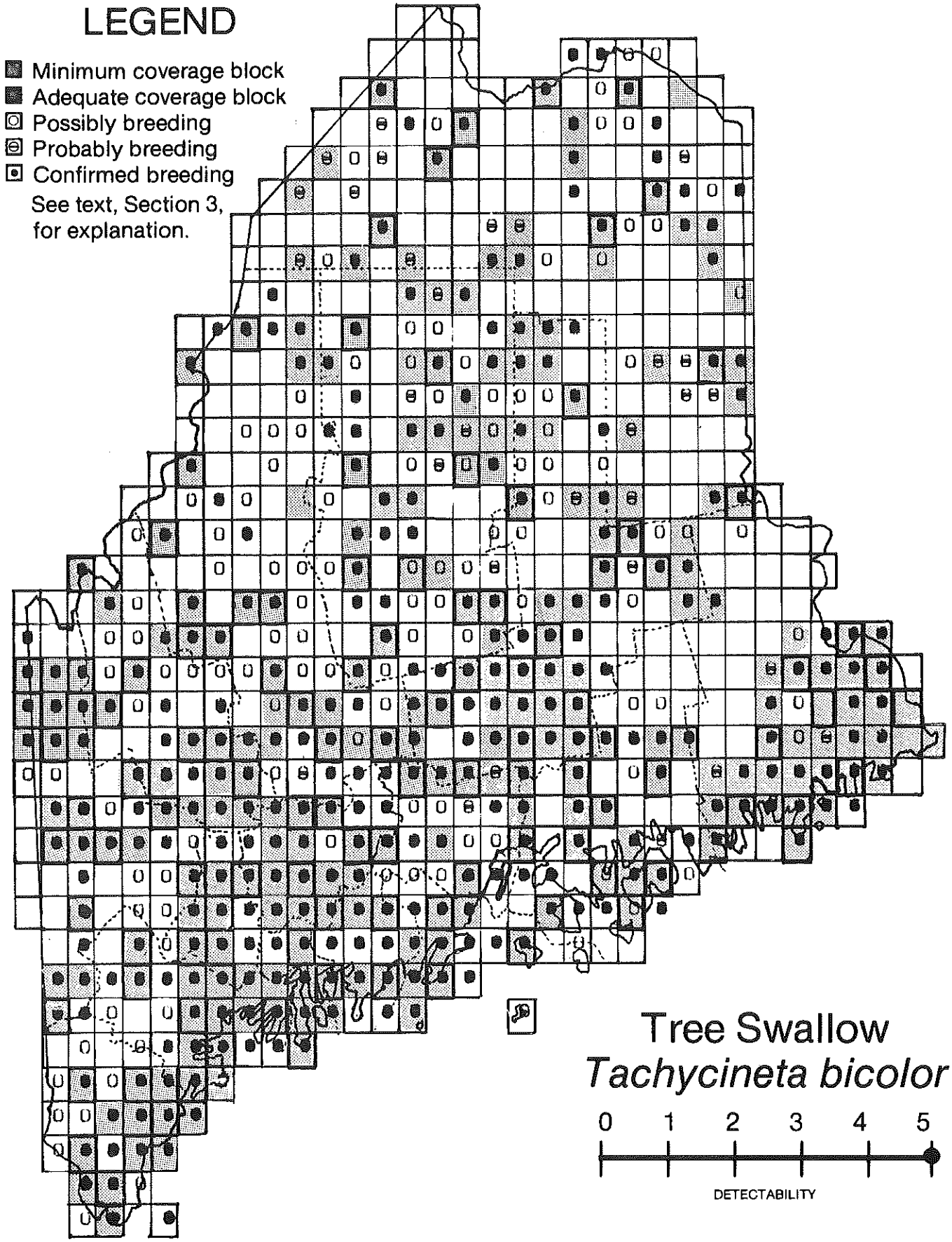
Less widespread in northwestern parts of the state.

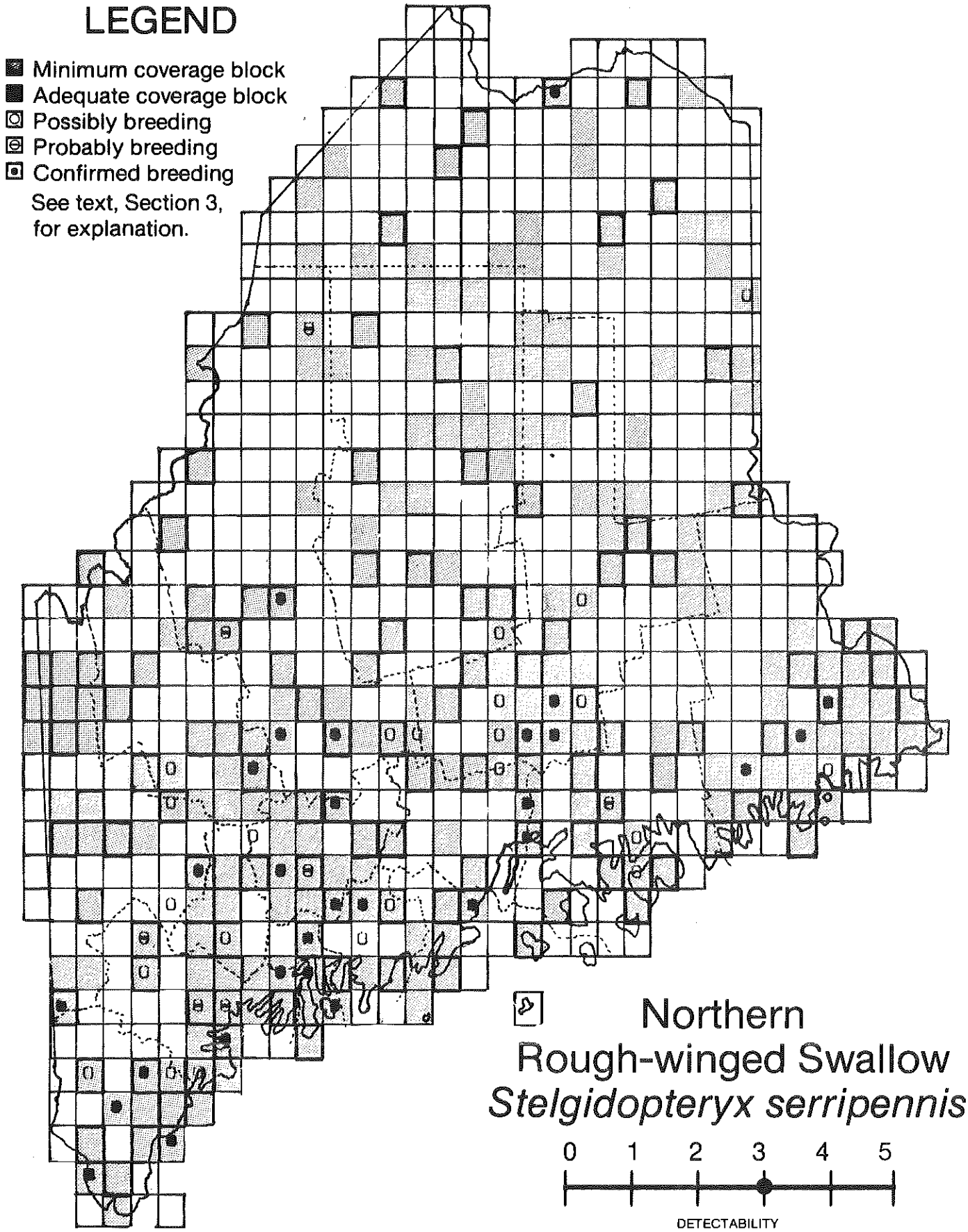

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Eastern Kingbird
Tyrannus tyrannus
0 1 2 3 4 5
DETECTABILITY


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Horned Lark
Eremophila alpestris
0 1 2 3 4 5
DETECTABILITY

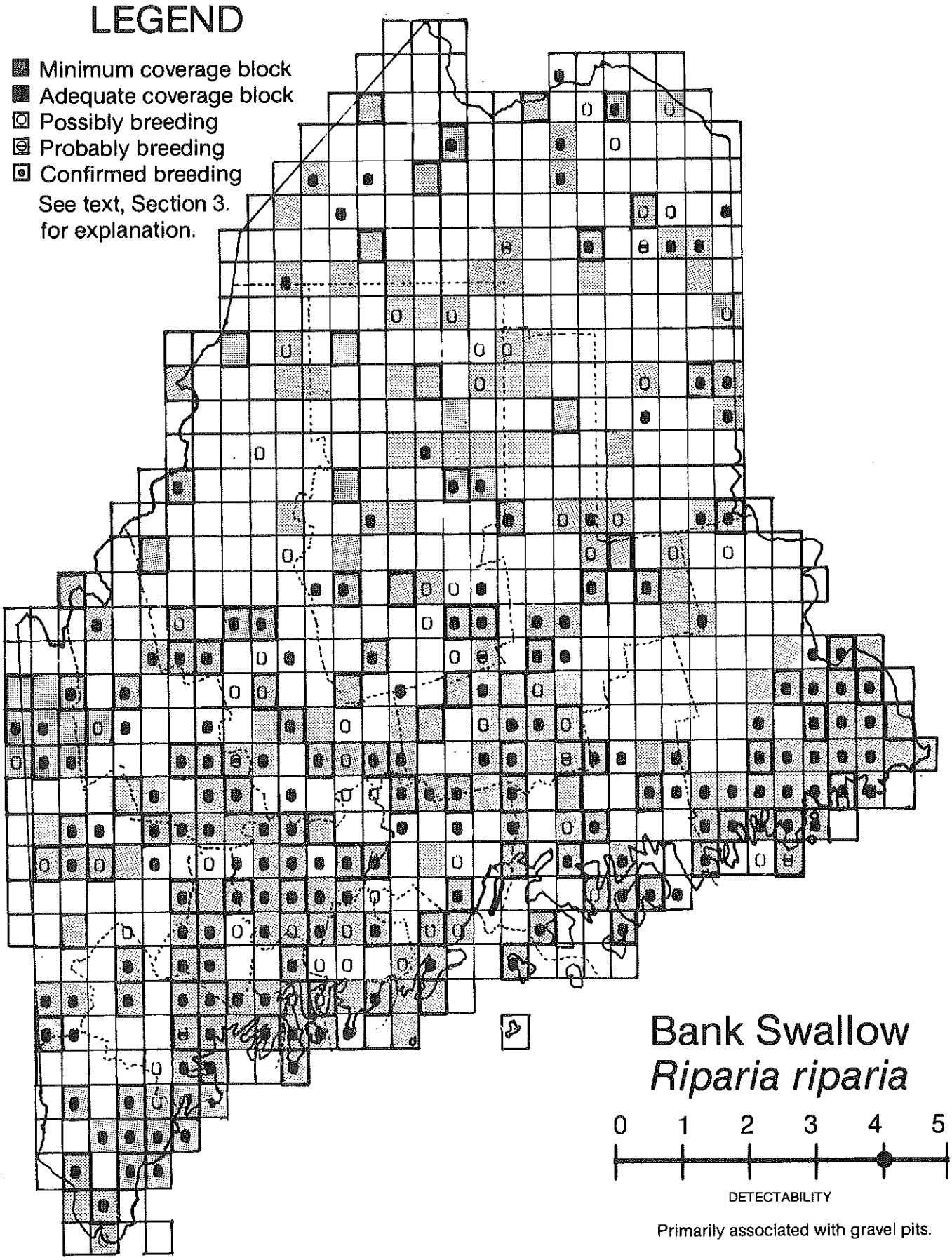


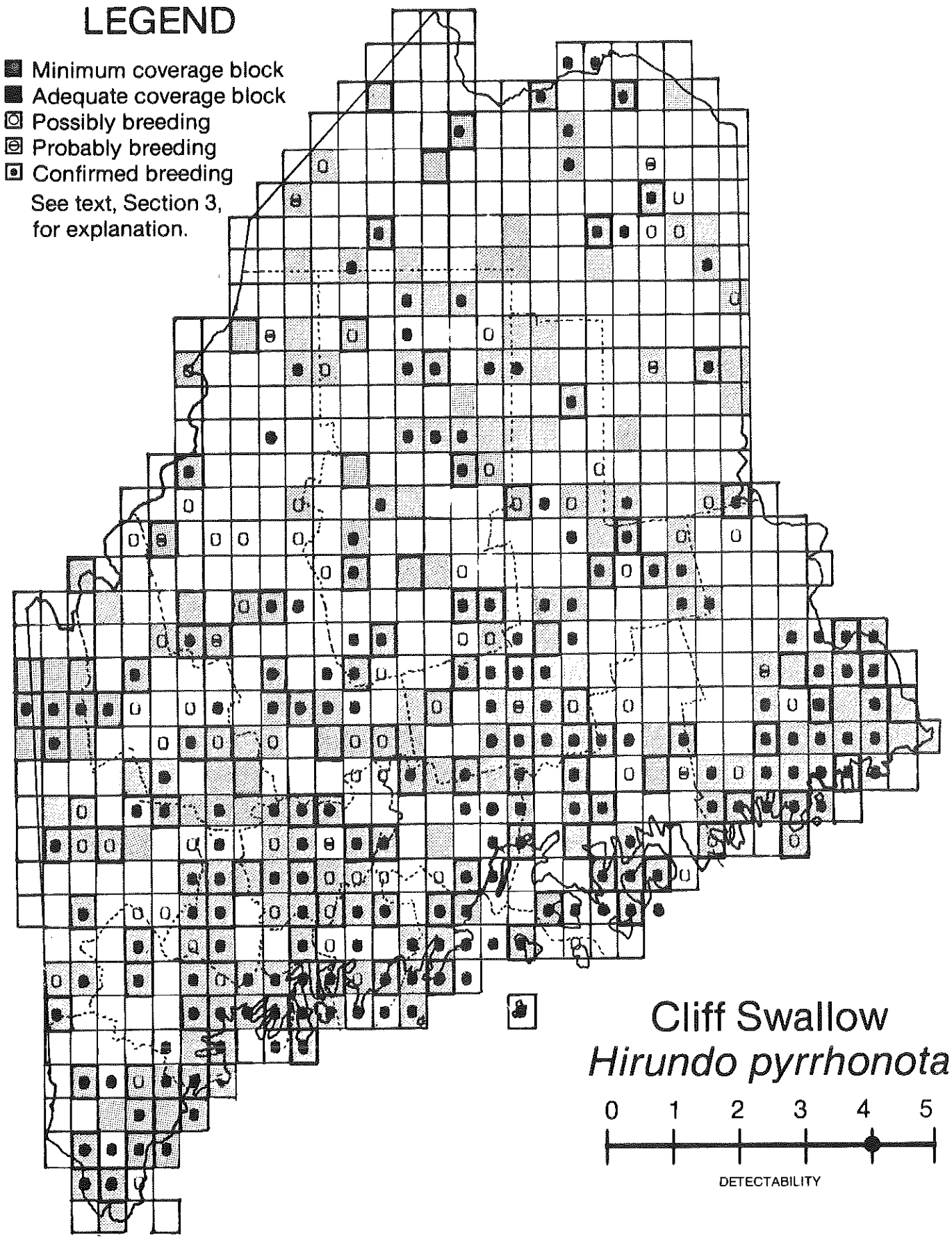
Approaches northern limit of range. Colonial nester, chiefly in bird boxes in developed regions of the state.

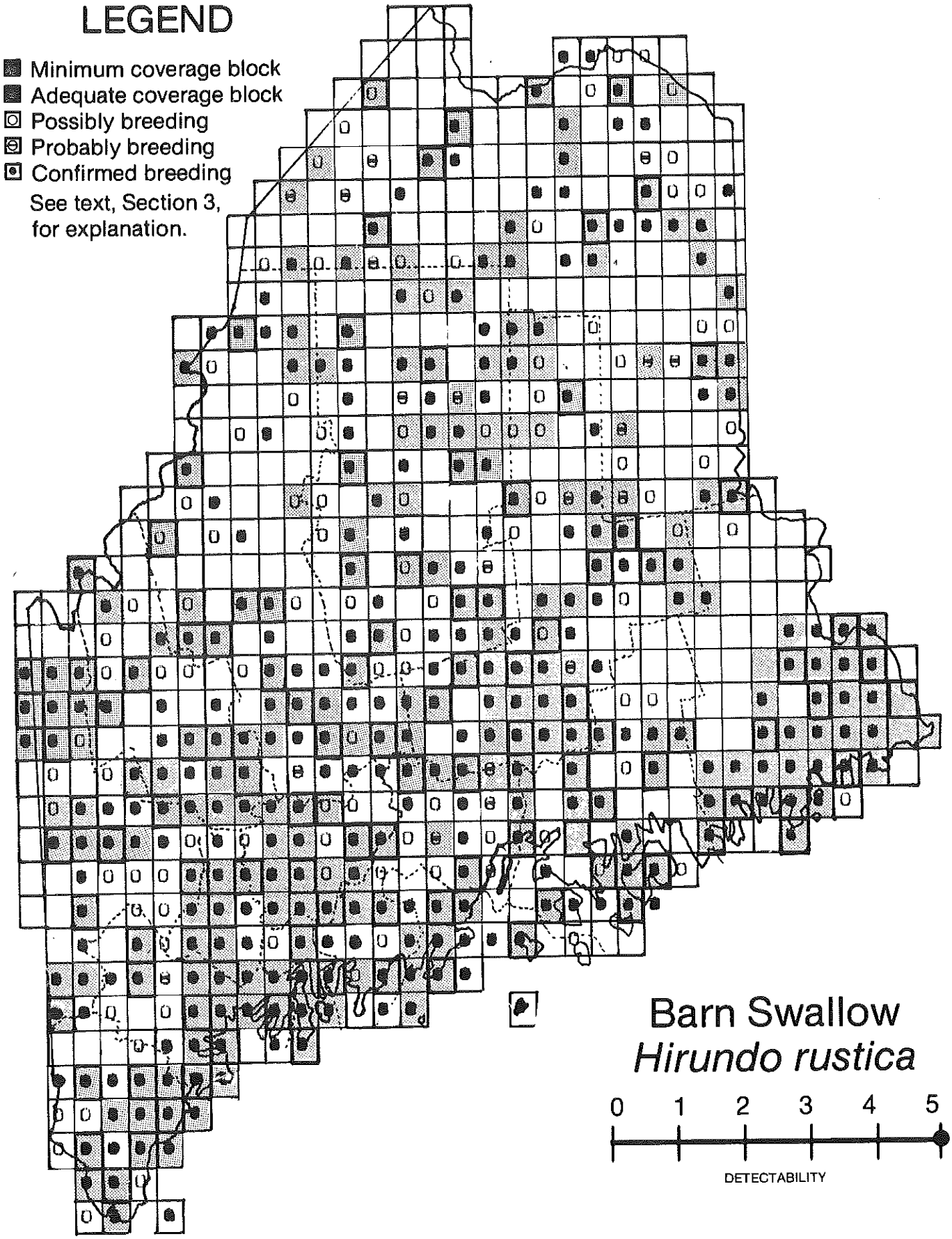

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Tree Swallow
Tachycineta bicolor
0 1 2 3 4 5
DETECTABILITY

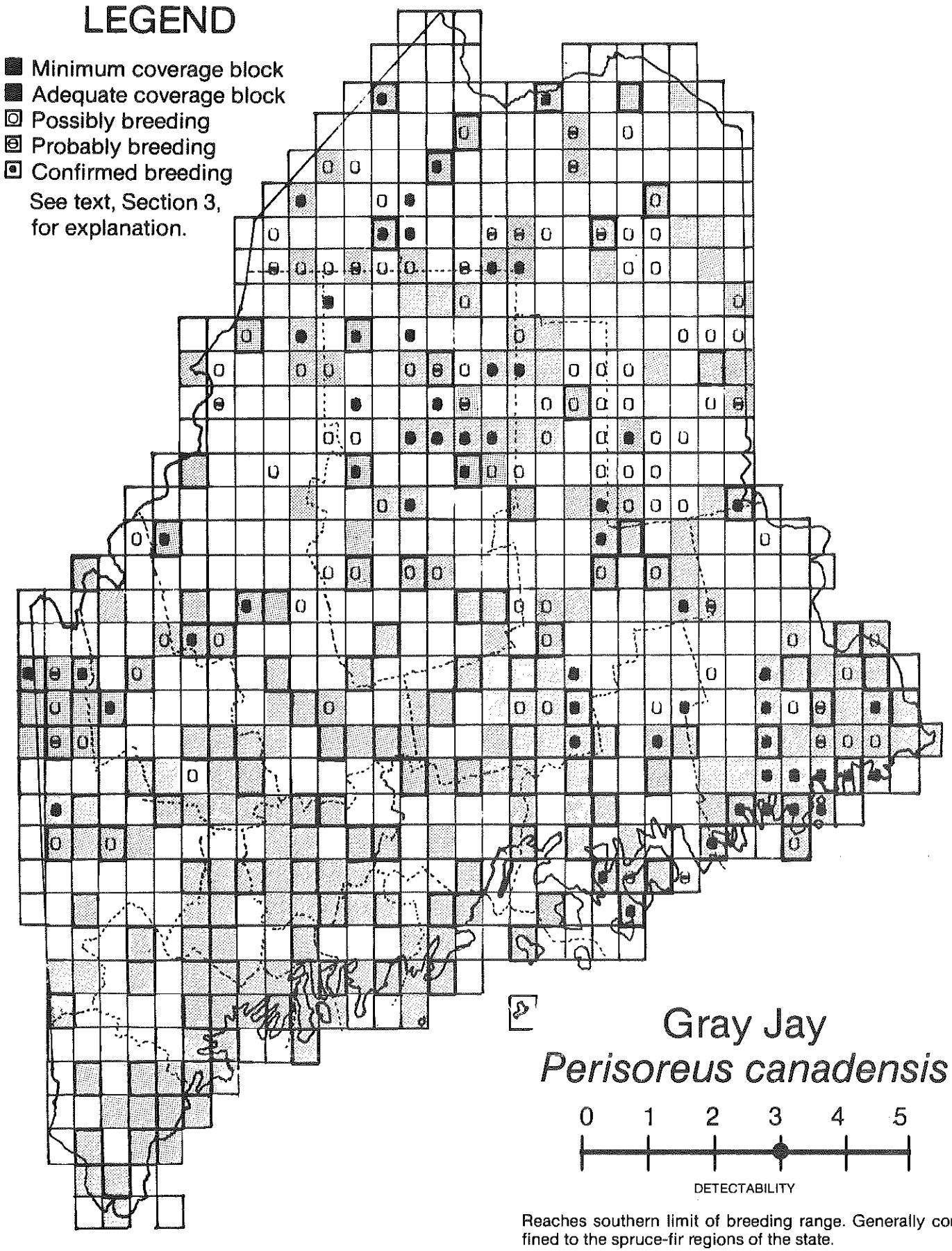


Reaches northern limit of breeding range. Note low detectability score.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3. for explanation.
Bank Swallow
Riparia riparia
0 1 2 3 4 5
DETECTABILITY
Primarily associated with gravel pits.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Cliff Swallow
Hirundo pyrrhonota
0 1 2 3 4 5
DETECTABILITY


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Barn Swallow
Hirundo rustica
0 1 2 3 4 5
DETECTABILITY

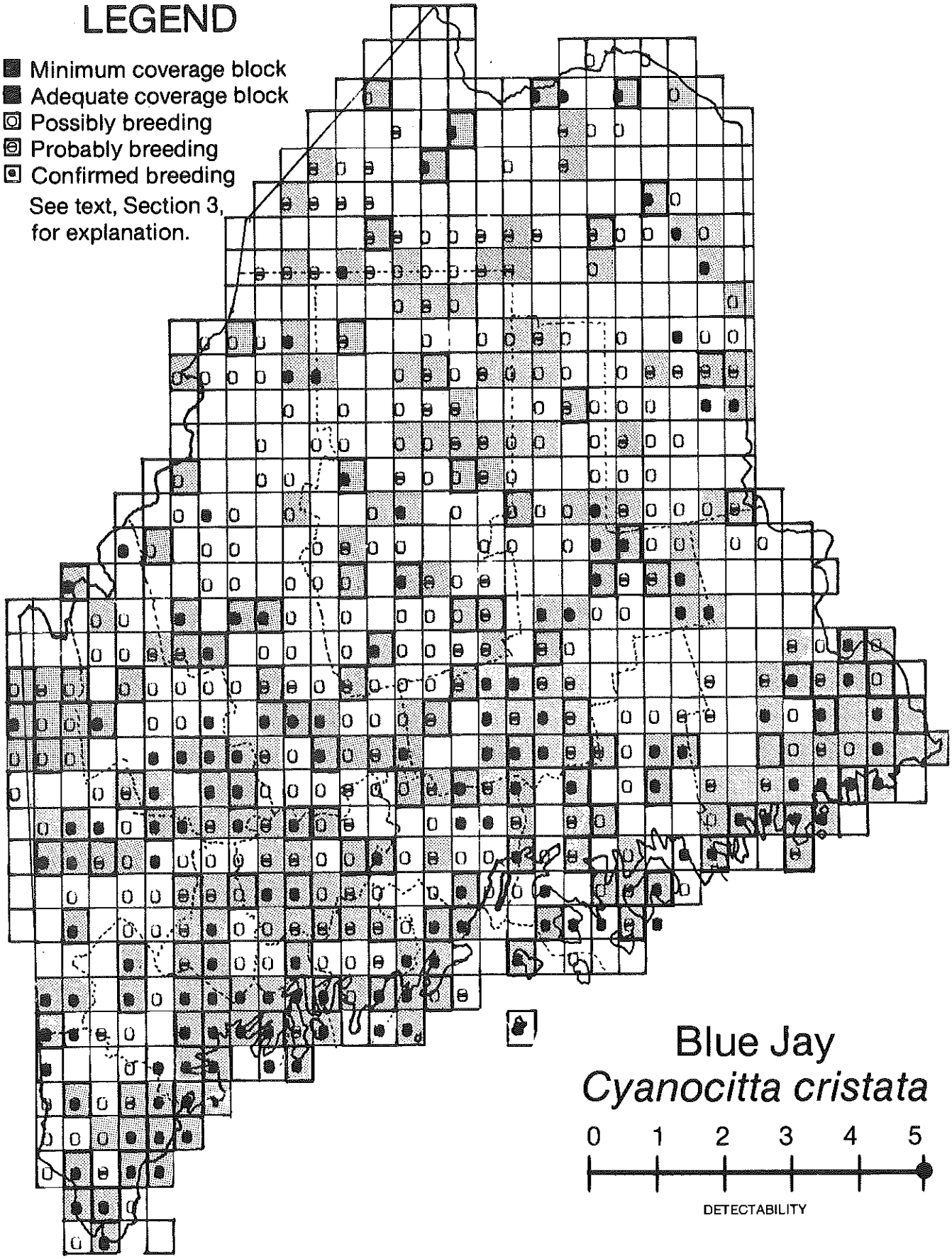


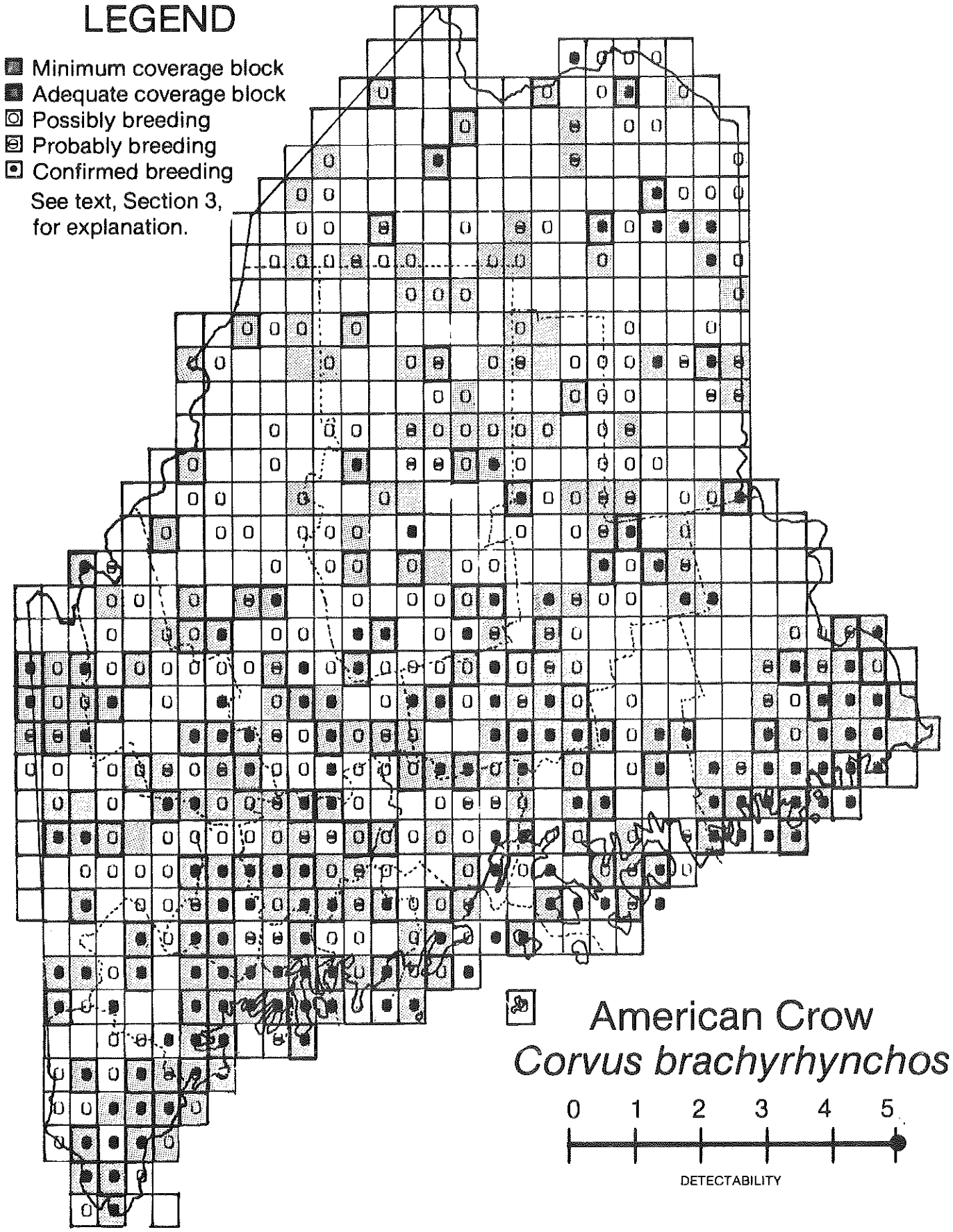
Gray Jay
Perisoreus canadensis

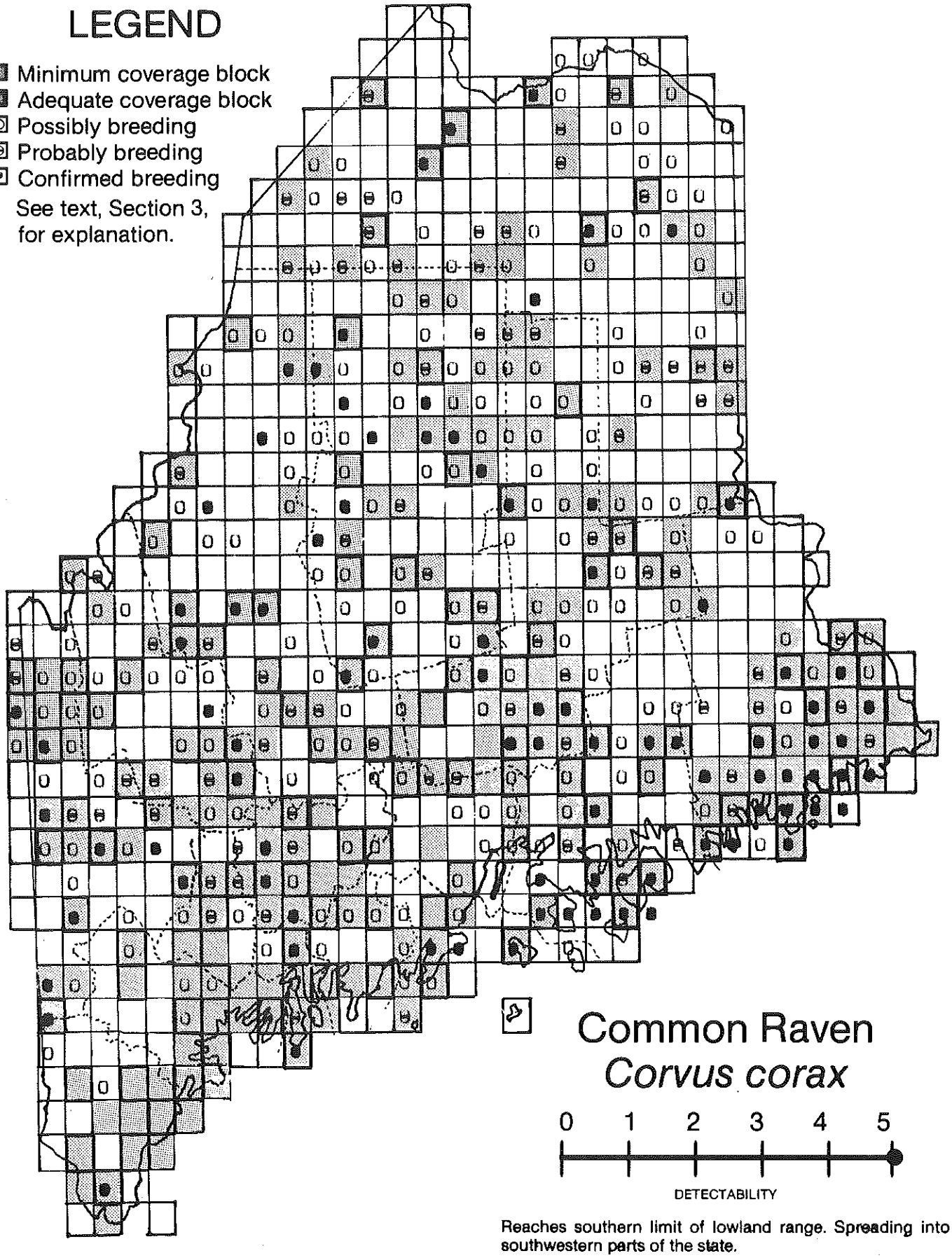
0 1 2 3 4 5

DETECTABILITY

Reaches southern limit of breeding range. Generally confined to the spruce-fir regions of the state.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Blue Jay
Cyanocitta cristata
0 1 2 3 4 5
DETECTABILITY


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
American Crow
Corvus brachyrhynchos
0 1 2 3 4 5
DETECTABILITY

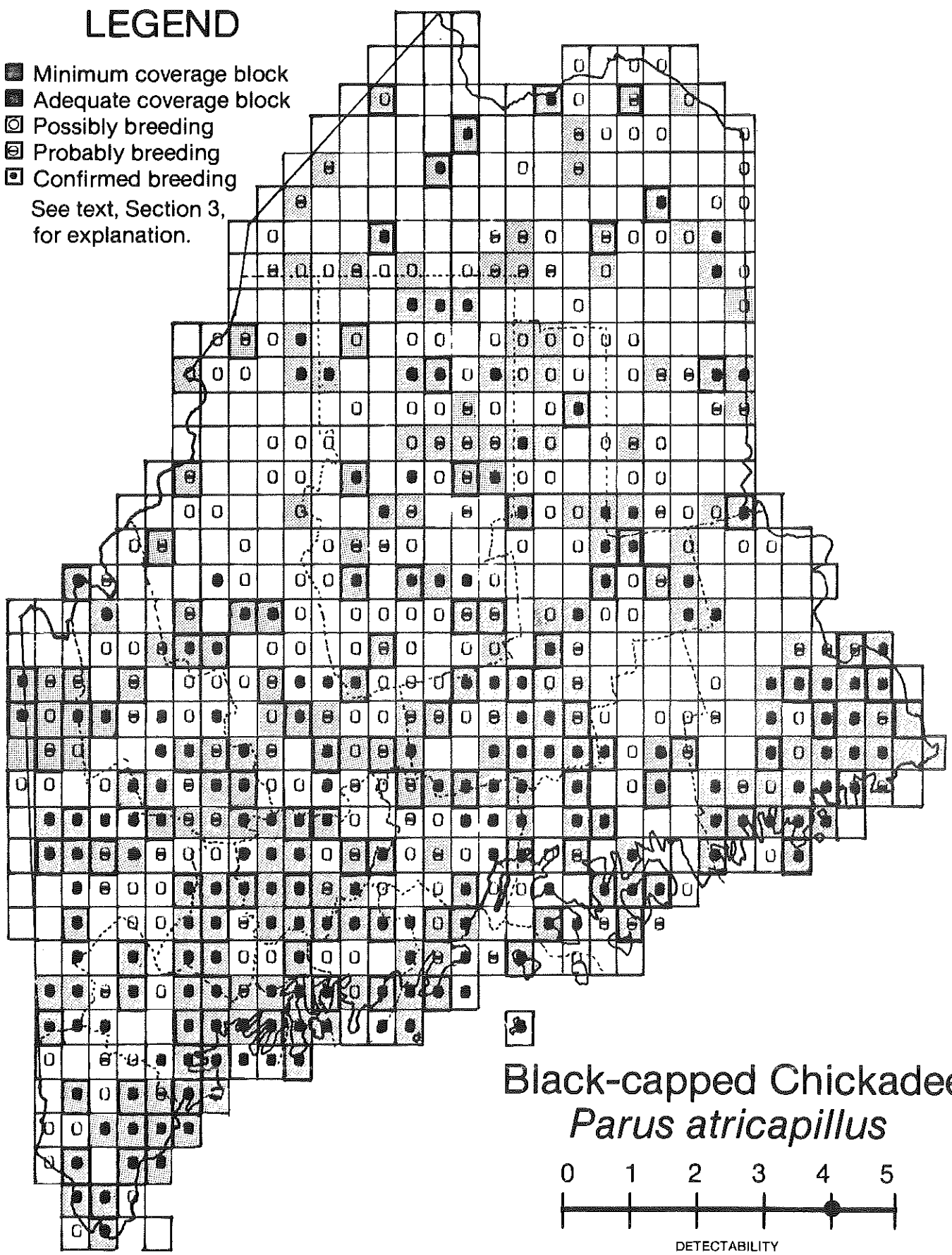


Common Raven
Corvus corax

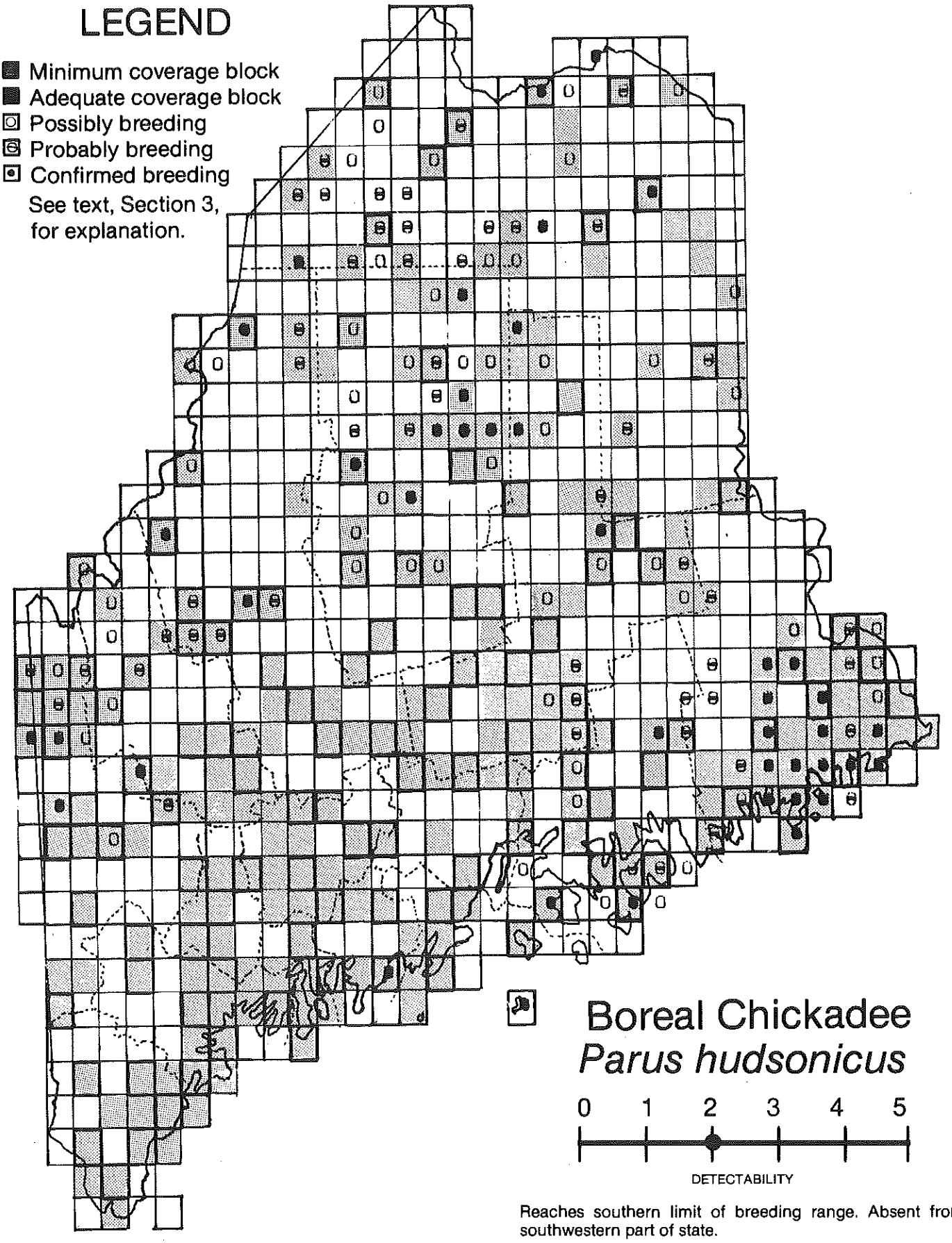
0 1 2 3 4 5

DETECTABILITY

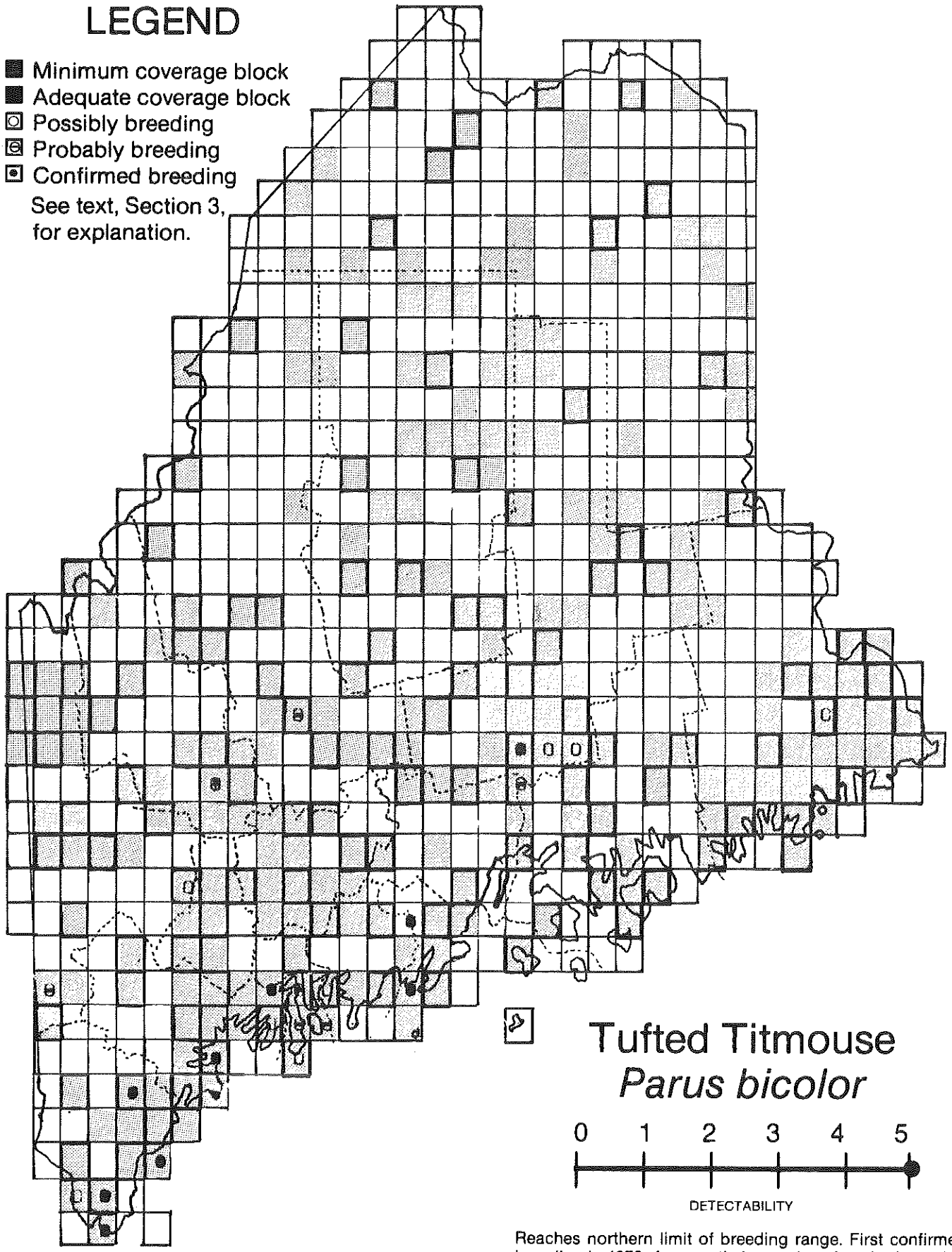
Reaches southern limit of lowland range. Spreading into southwestern parts of the state.



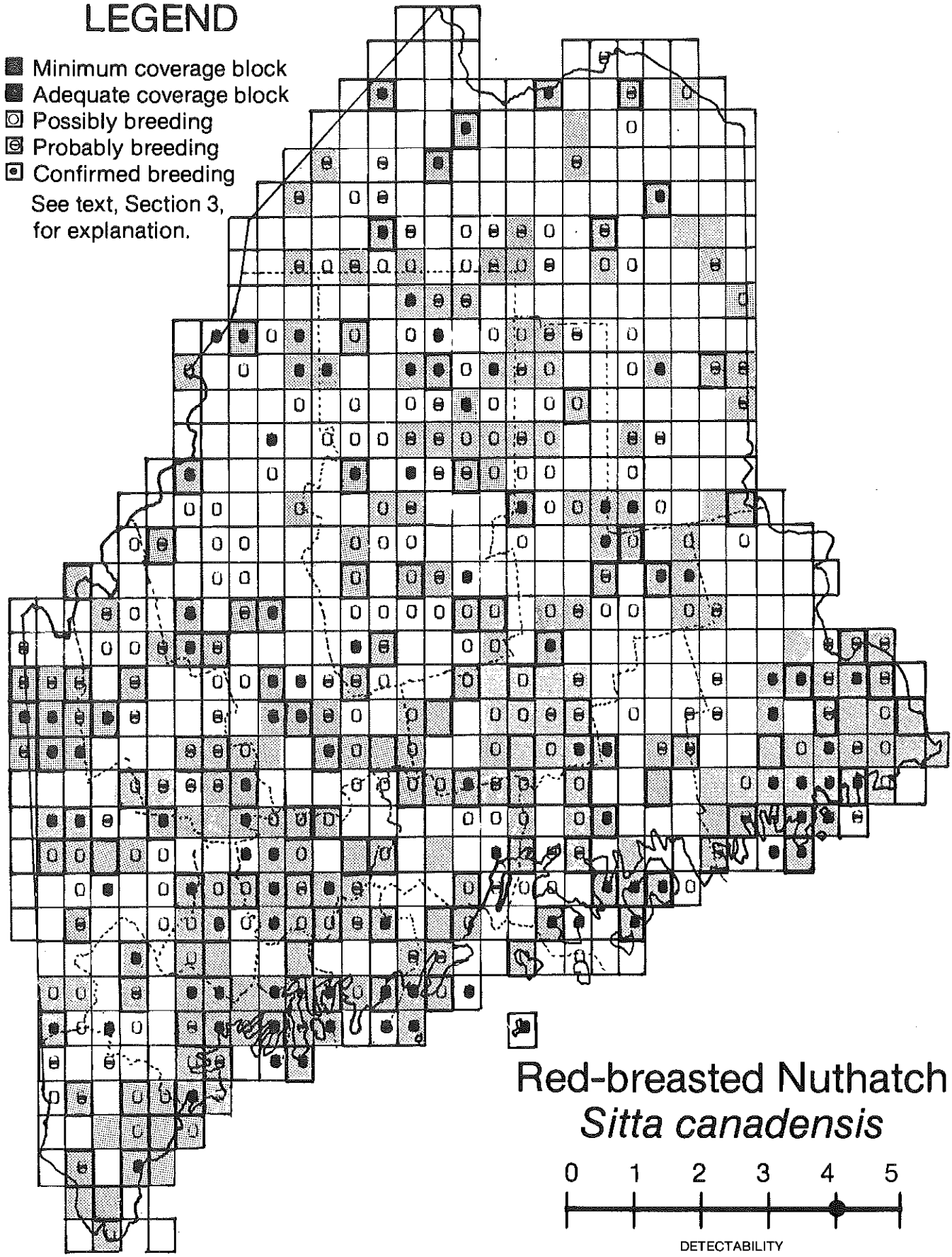
See Schroeder (1983a) for habitat information.

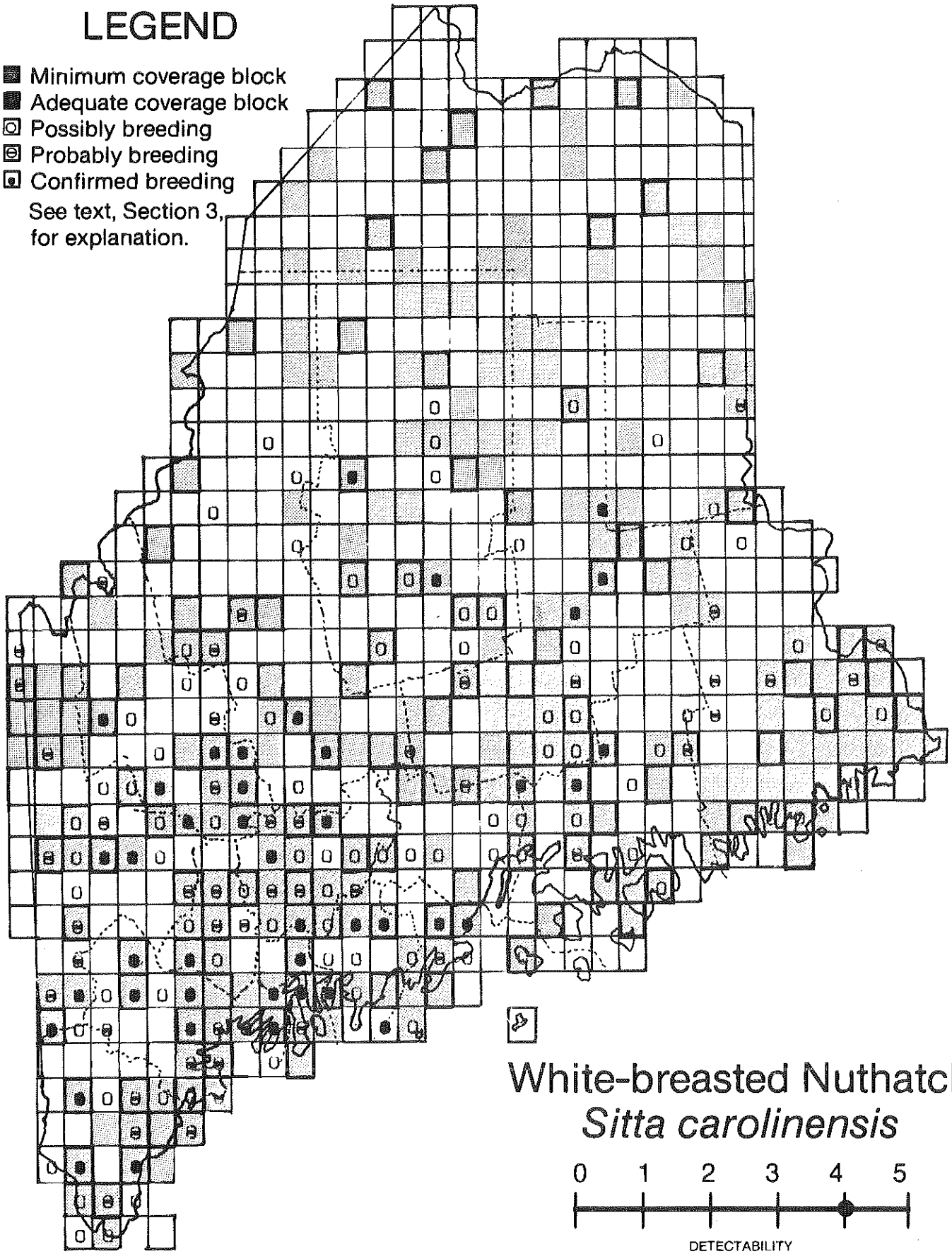


Reaches southern limit of breeding range. Absent from southwestern part of state.

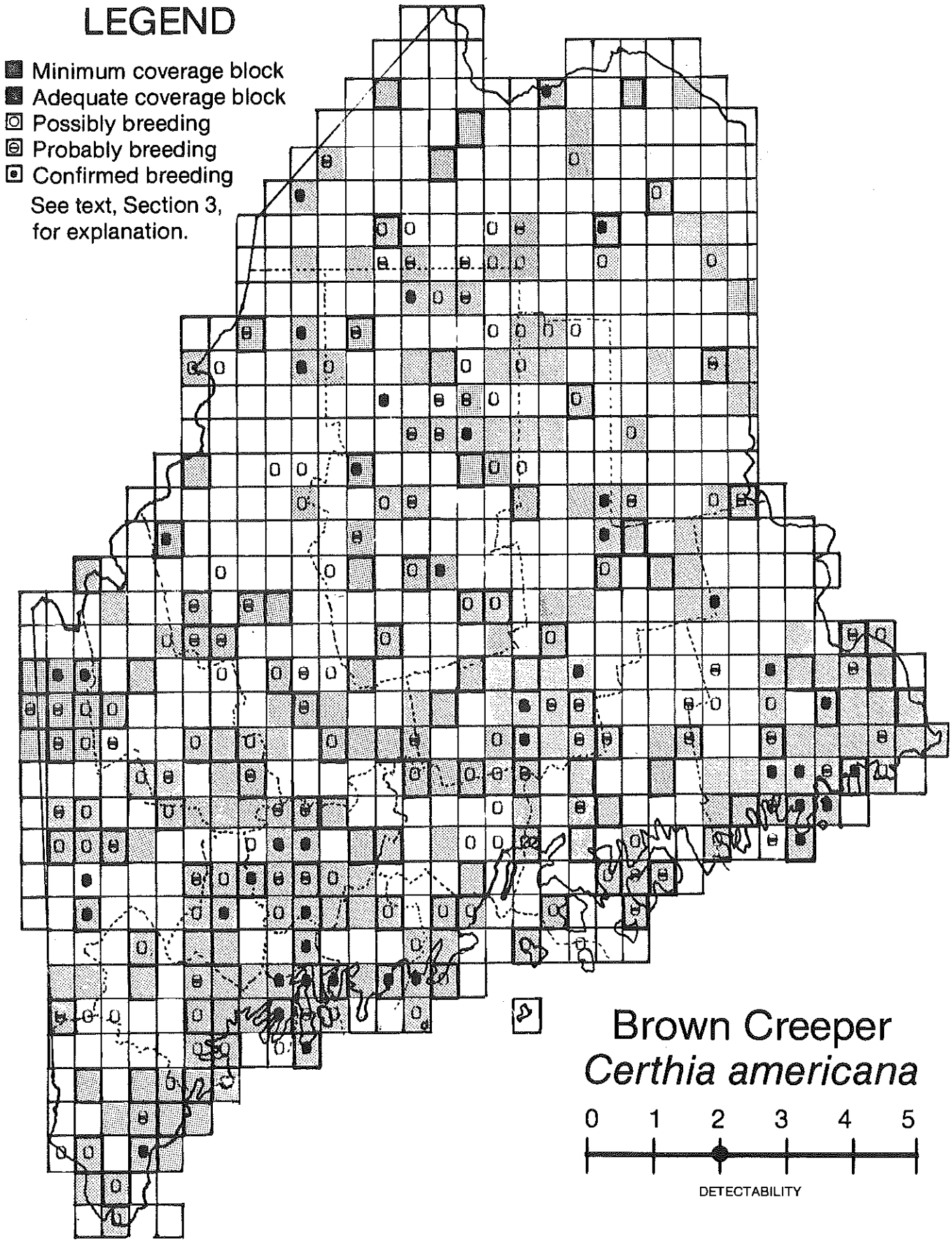


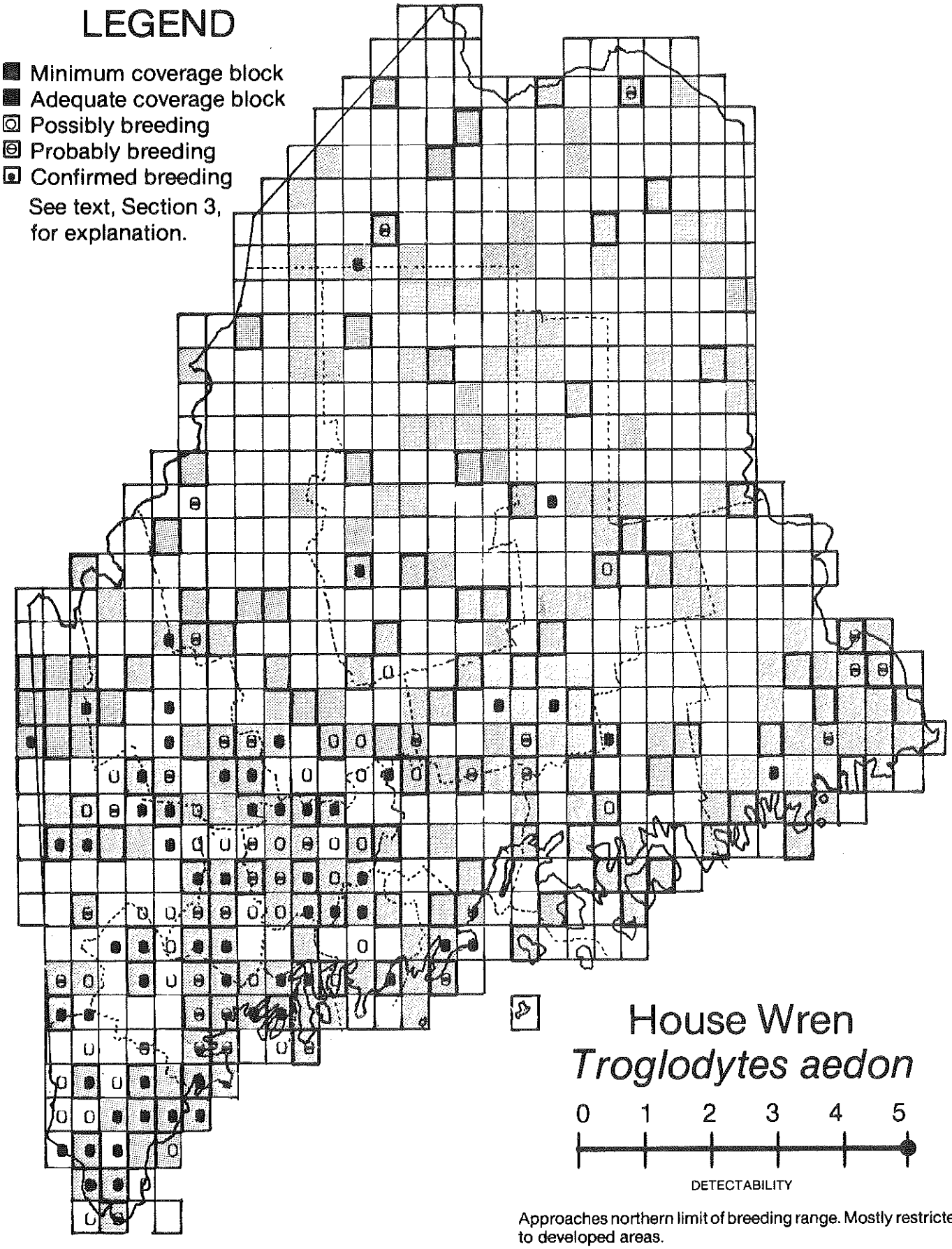
Reaches northern limit of breeding range. First confirmed breeding in 1978. Apparently increasing. A major incursion occurred in 1983.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Red-breasted Nuthatch
Sitta canadensis
0 1 2 3 4 5
DETECTABILITY

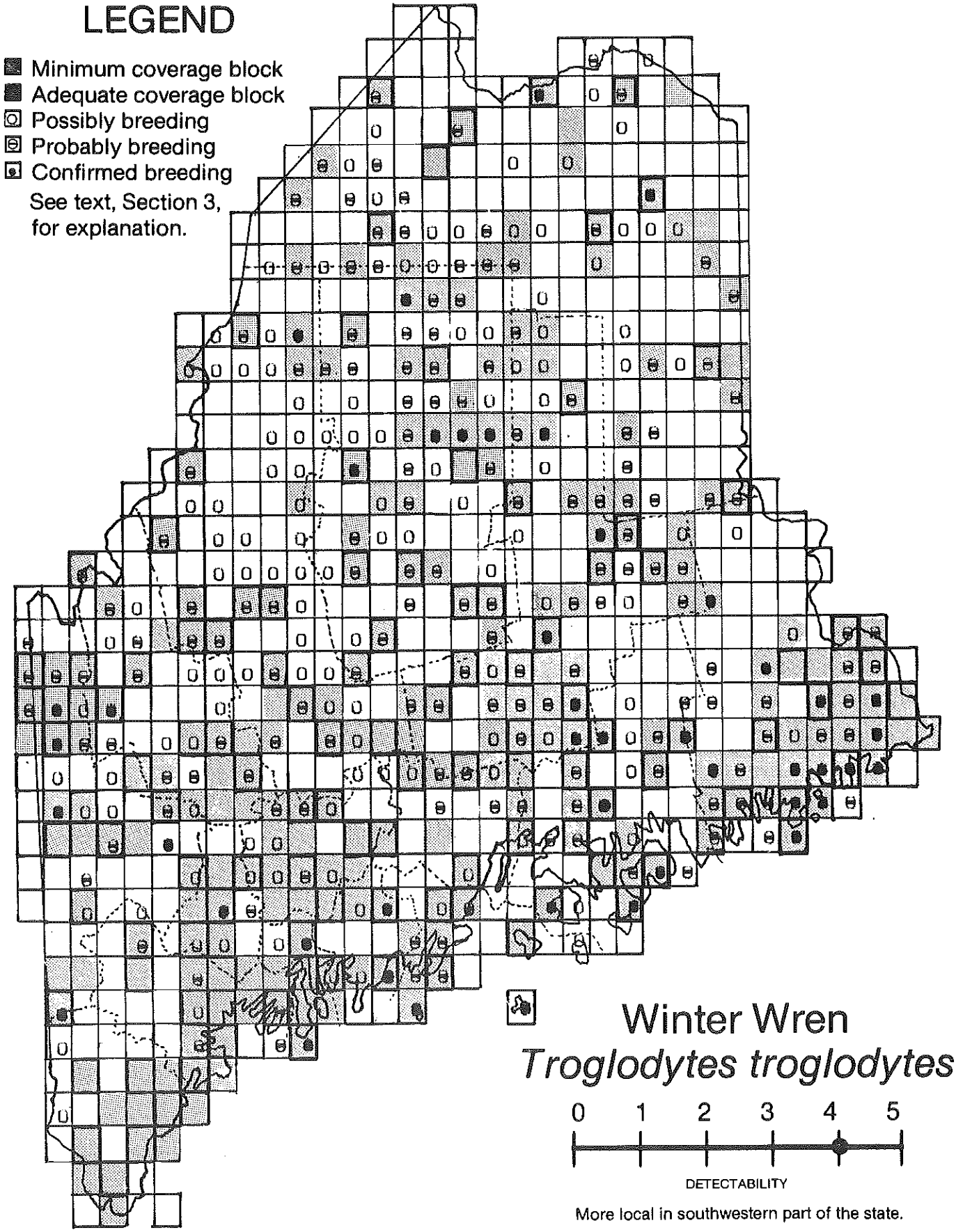


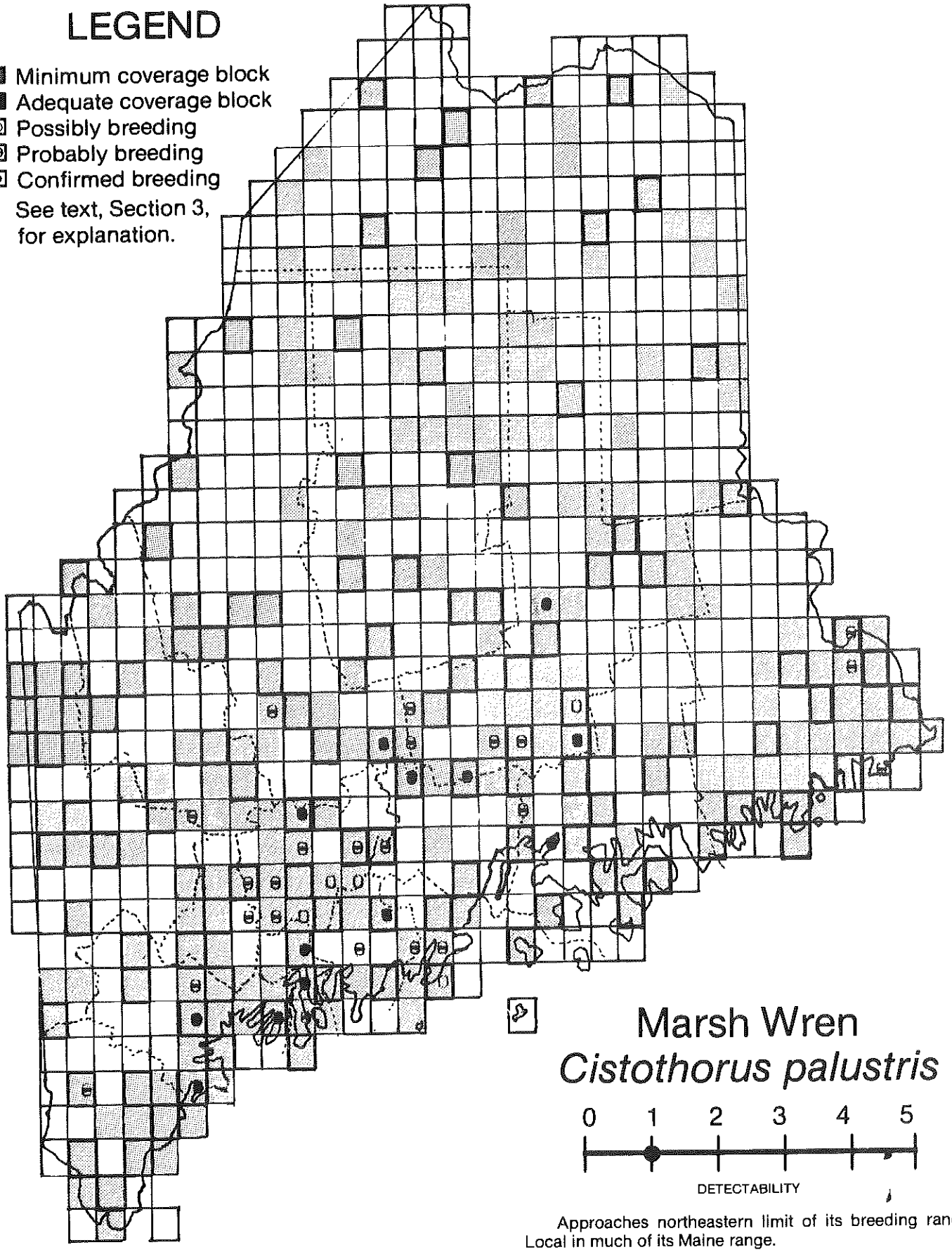
Approaches northern limit of breeding range.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Brown Creeper
Certhia americana
0 1 2 3 4 5
DETECTABILITY

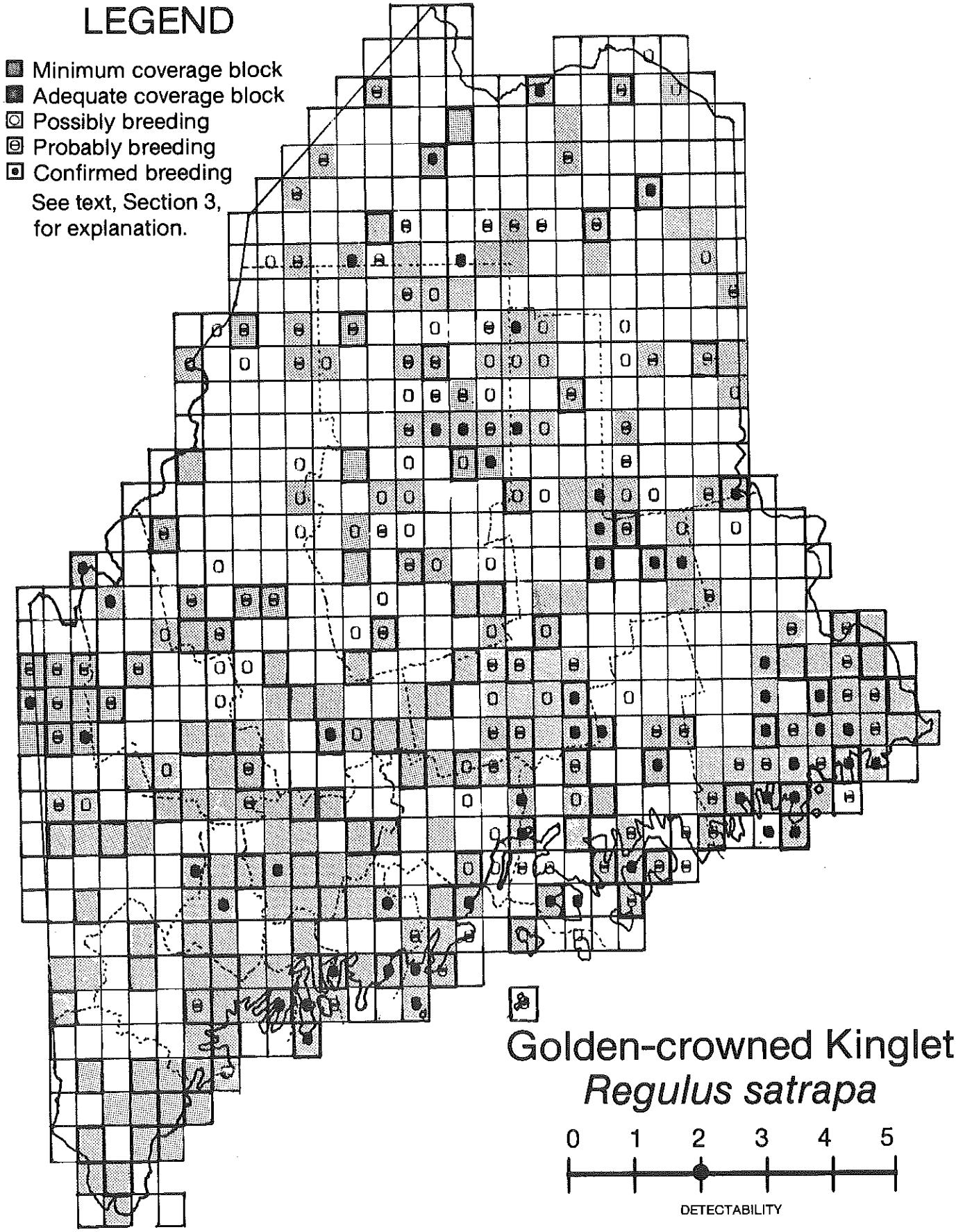


Approaches northern limit of breeding range. Mostly restricted to developed areas.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Winter Wren
Troglodytes troglodytes
0 1 2 3 4 5
DETECTABILITY
More local in southwestern part of the state.

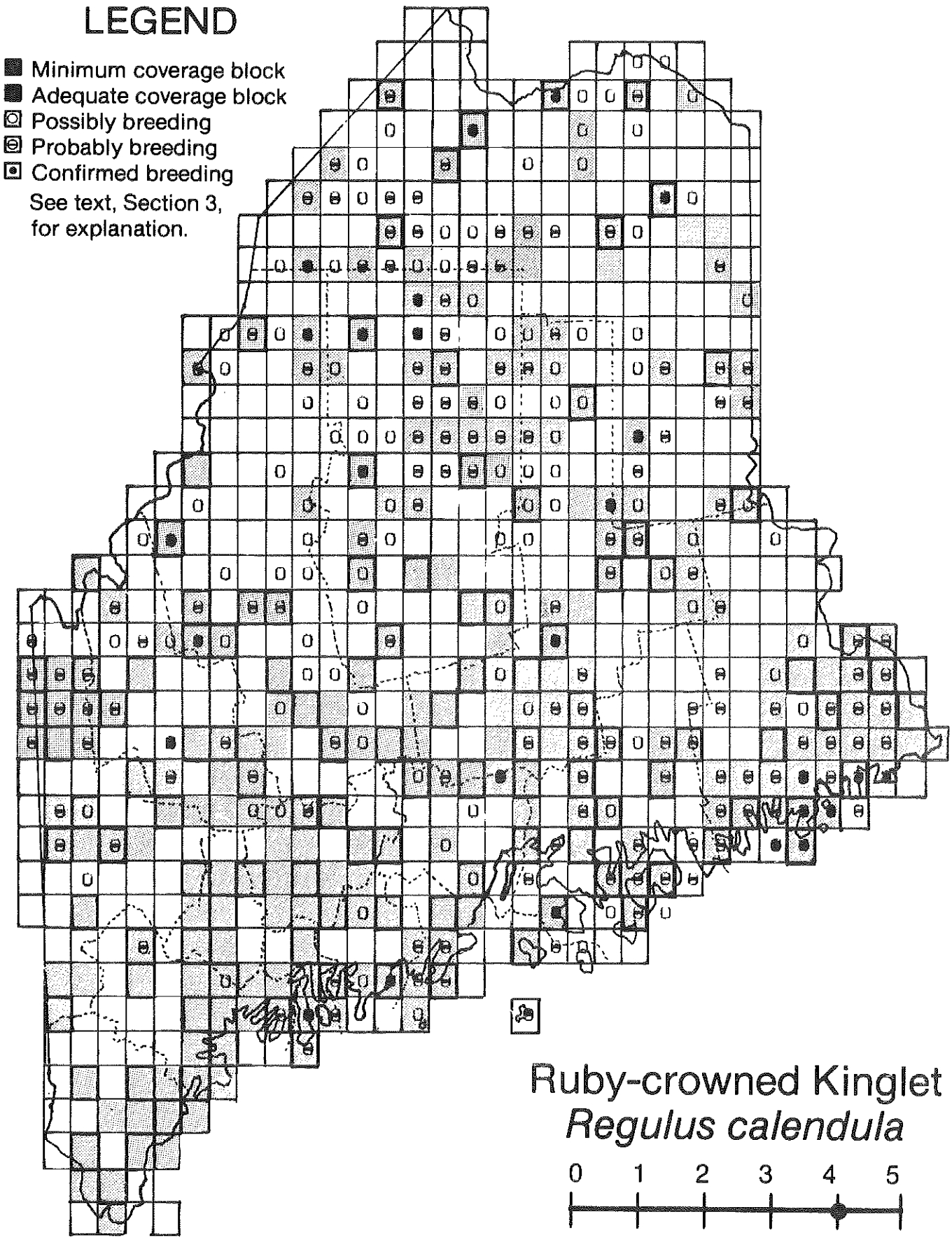


Approaches northeastern limit of its breeding range. Local in much of its Maine range.



Golden-crowned Kinglet
Regulus satrapa

Local in southwestern part of the state.

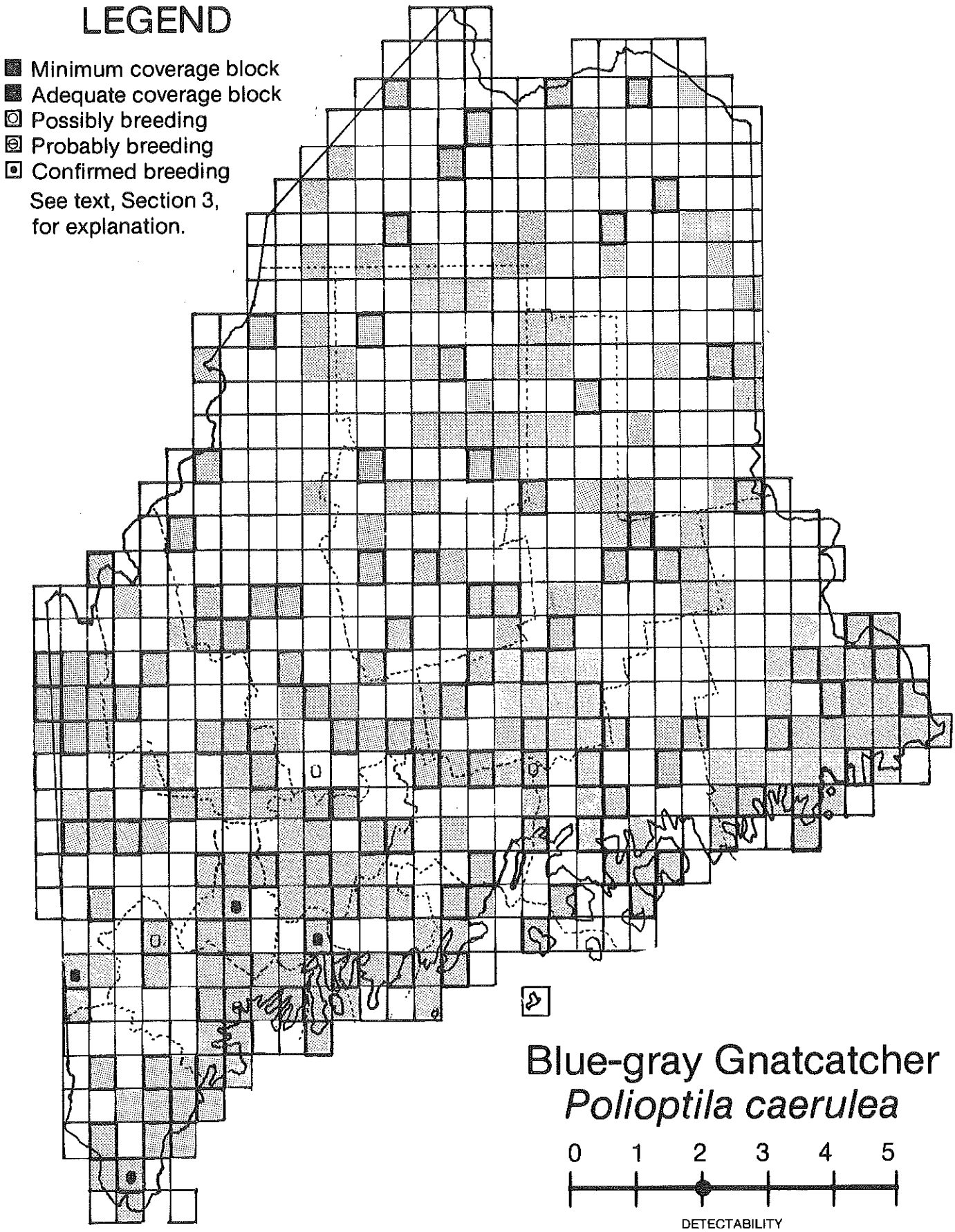


Ruby-crowned Kinglet
Regulus calendula

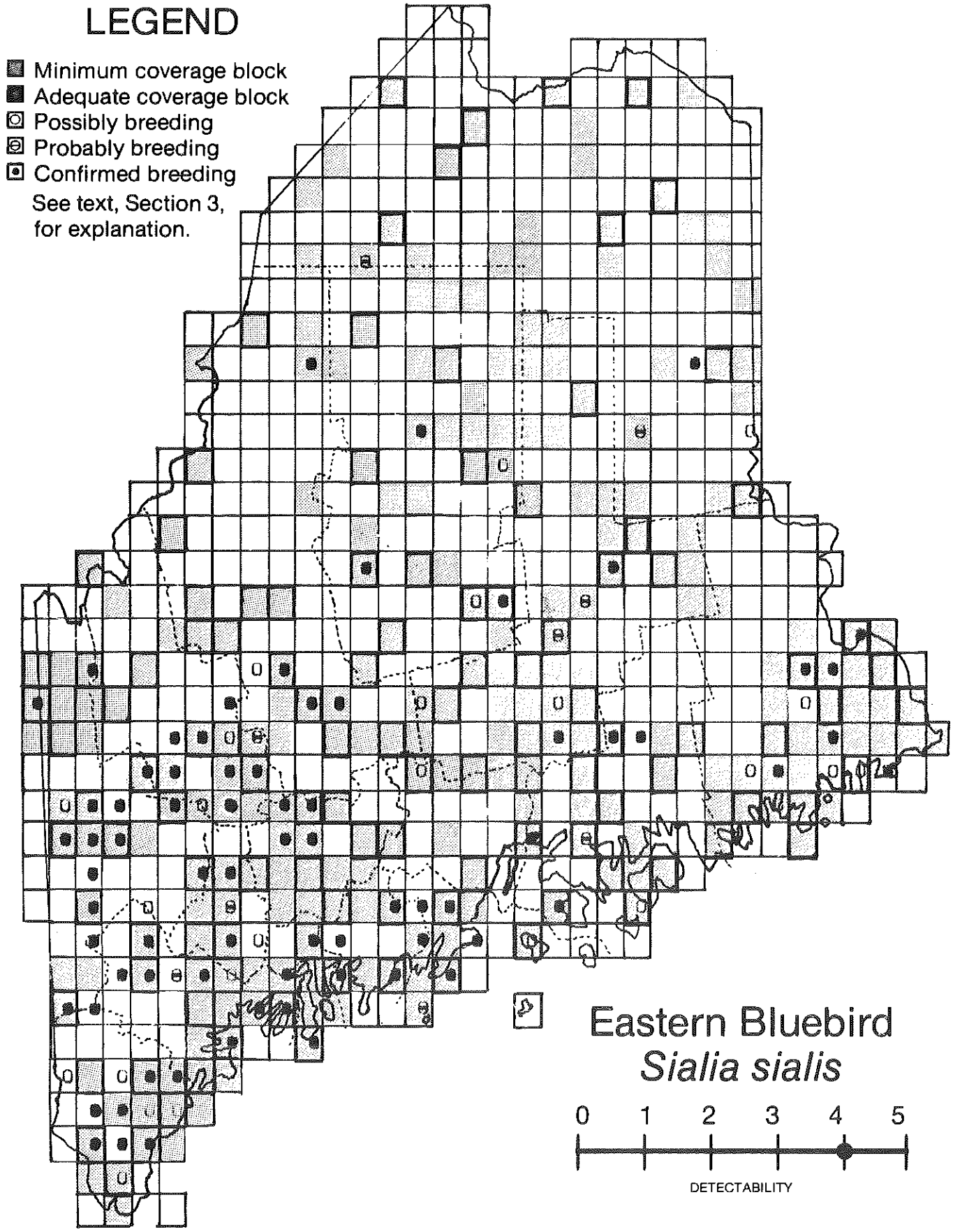
0 1 2 3 4 5

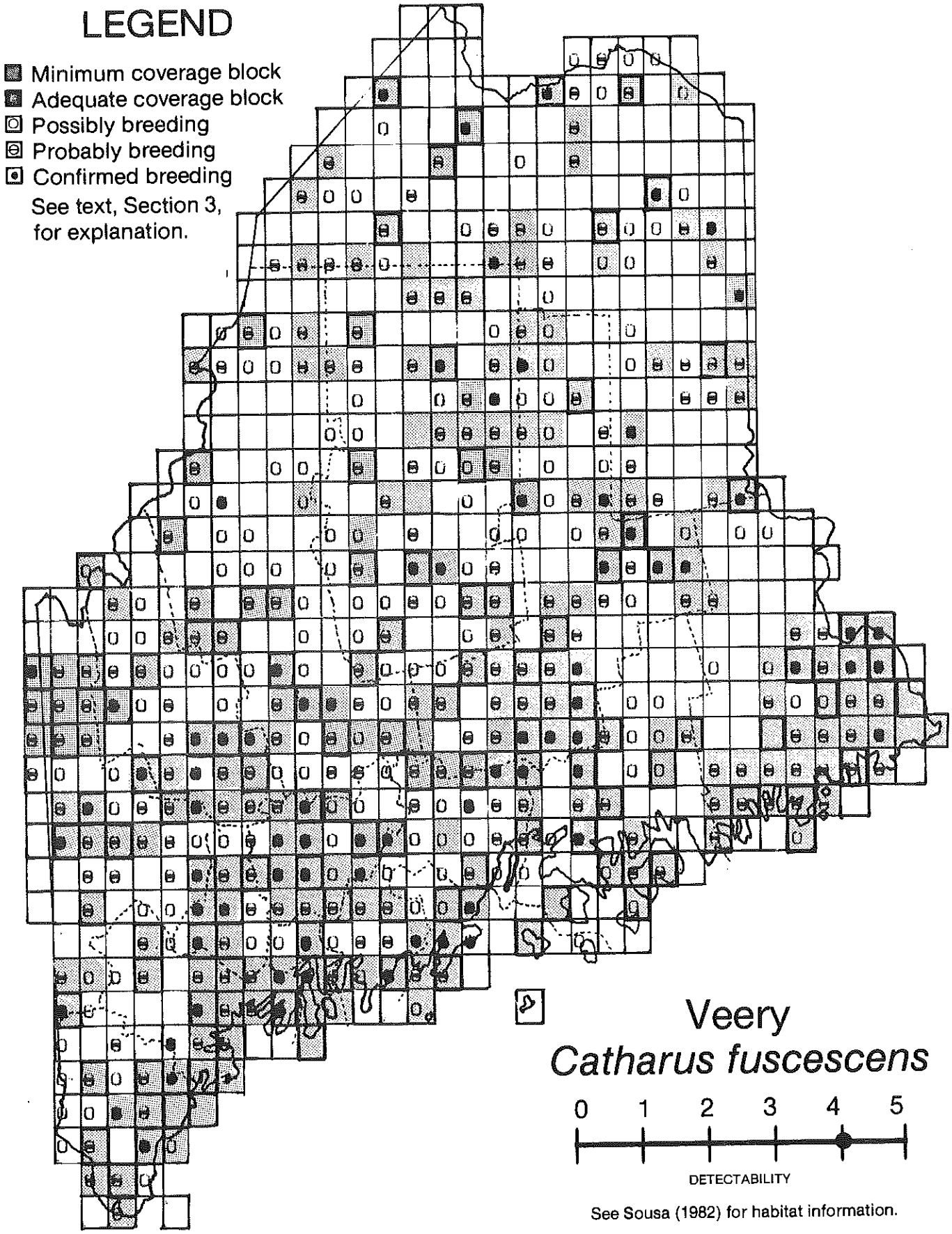
DETECTABILITY

Approaches southern limit of breeding range. Absent from extreme southwestern part of the state.

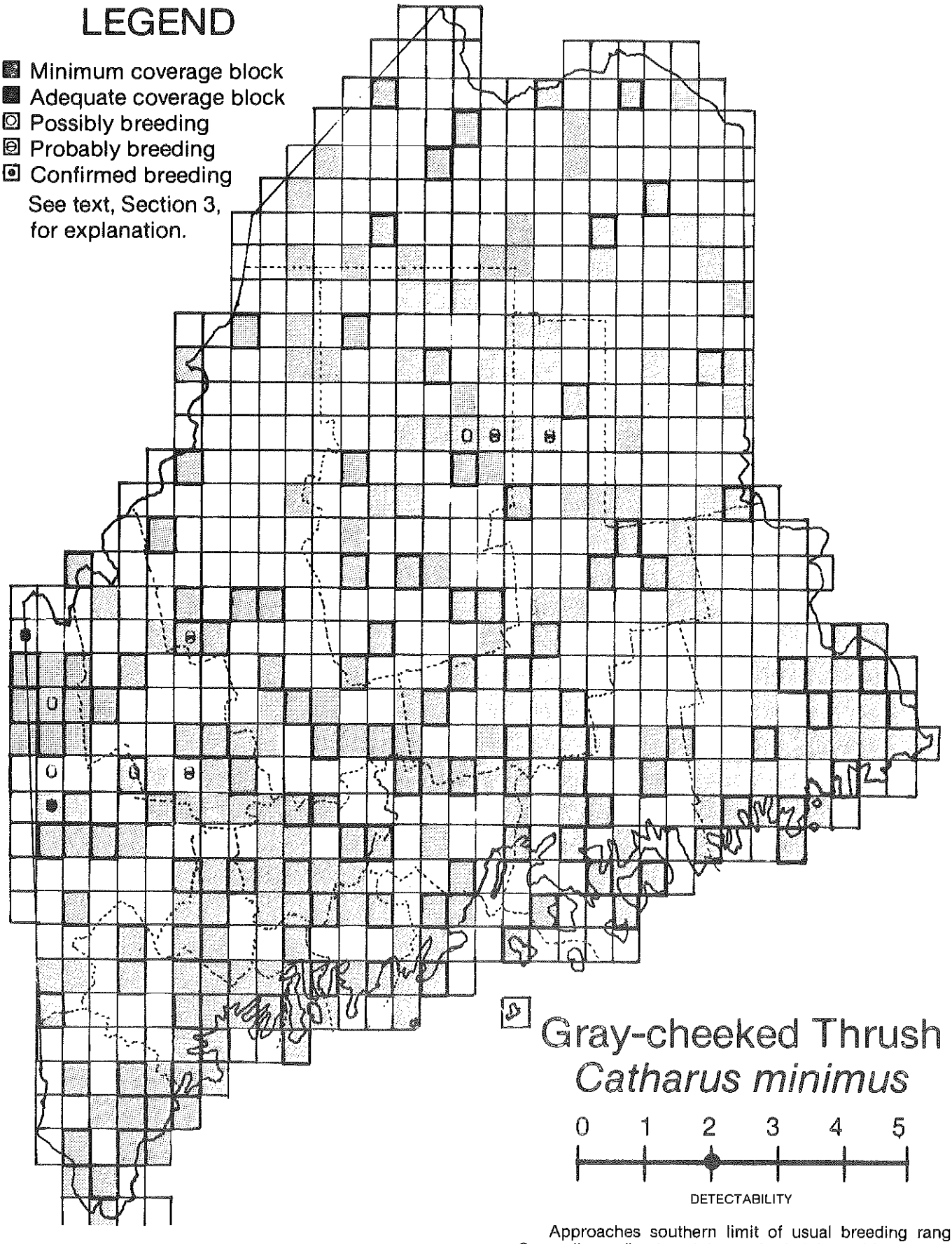


Reaches northern limit of range. First confirmed breeding in 1979. (*Maine Birdlife* 1:36). Possibly increasing. See Despres (1983).

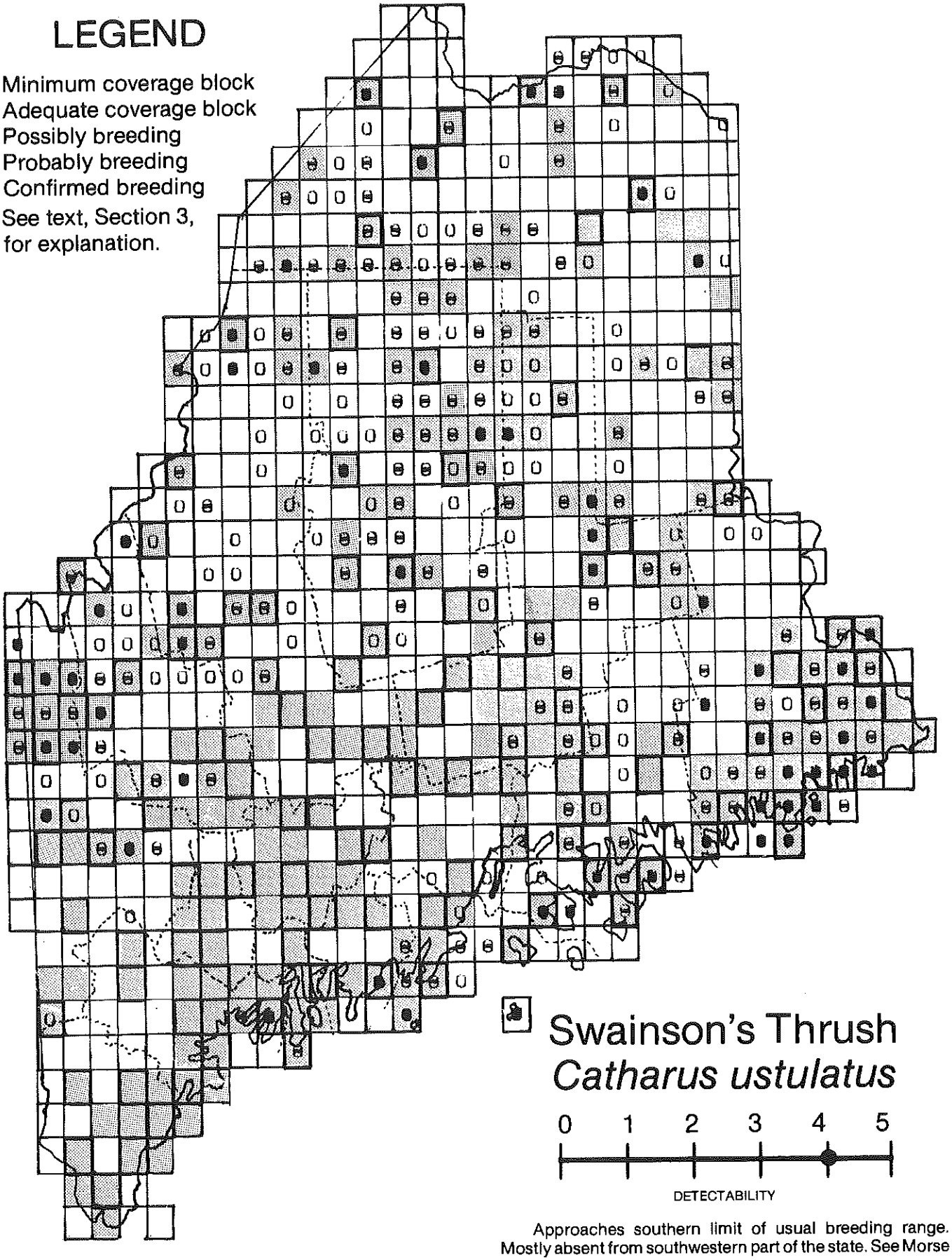

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Eastern Bluebird
Sialia sialis
0 1 2 3 4 5
DETECTABILITY



See Sousa (1982) for habitat information.



Approaches southern limit of usual breeding range. Generally confined to alpine and subalpine habitats.

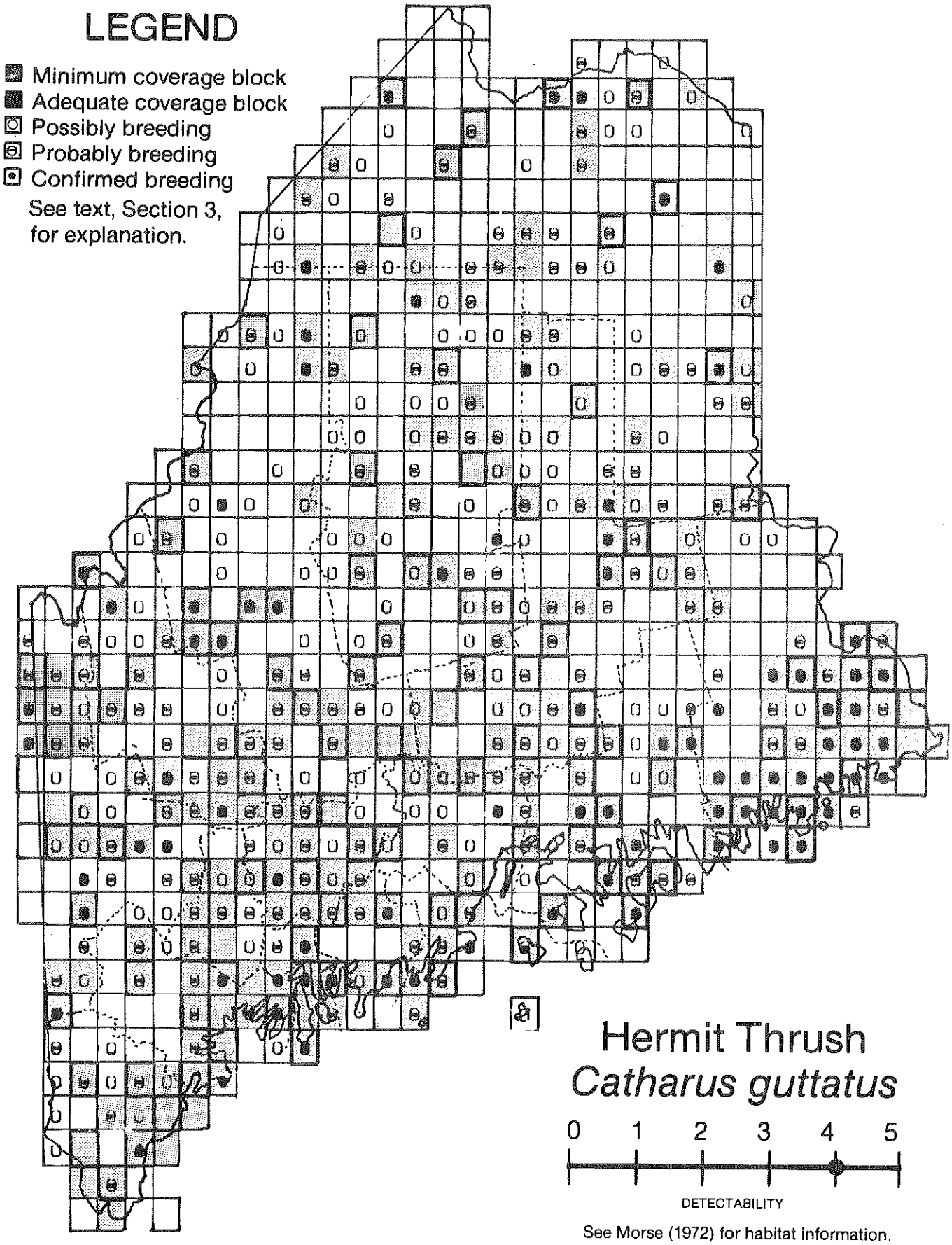


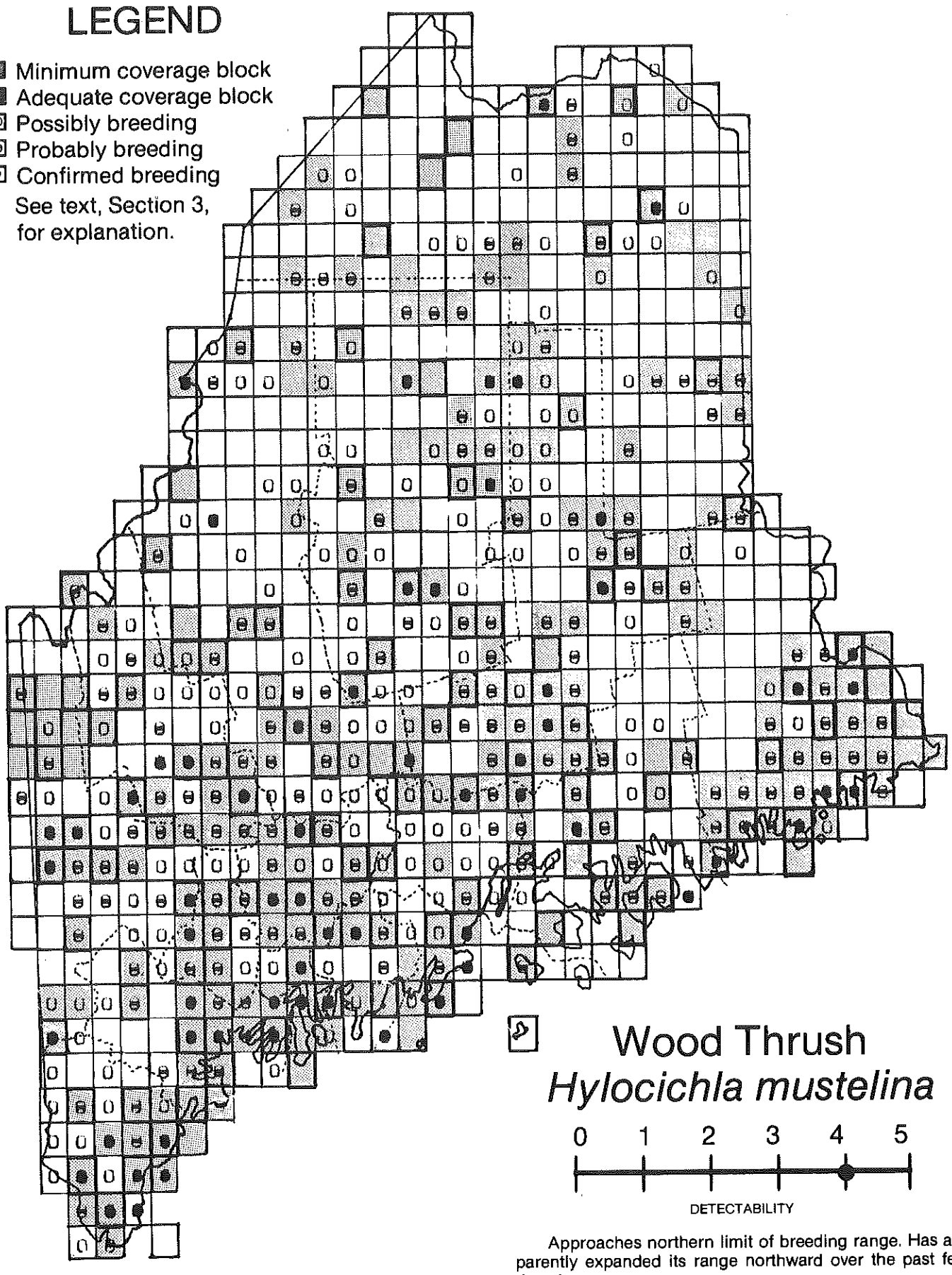
Swainson's Thrush
Catharus ustulatus

0 1 2 3 4 5

DETECTABILITY

Approaches southern limit of usual breeding range. Mostly absent from southwestern part of the state. See Morse (1972).


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Hermit Thrush
Catharus guttatus
0 1 2 3 4 5
DETECTABILITY
See Morse (1972) for habitat information.

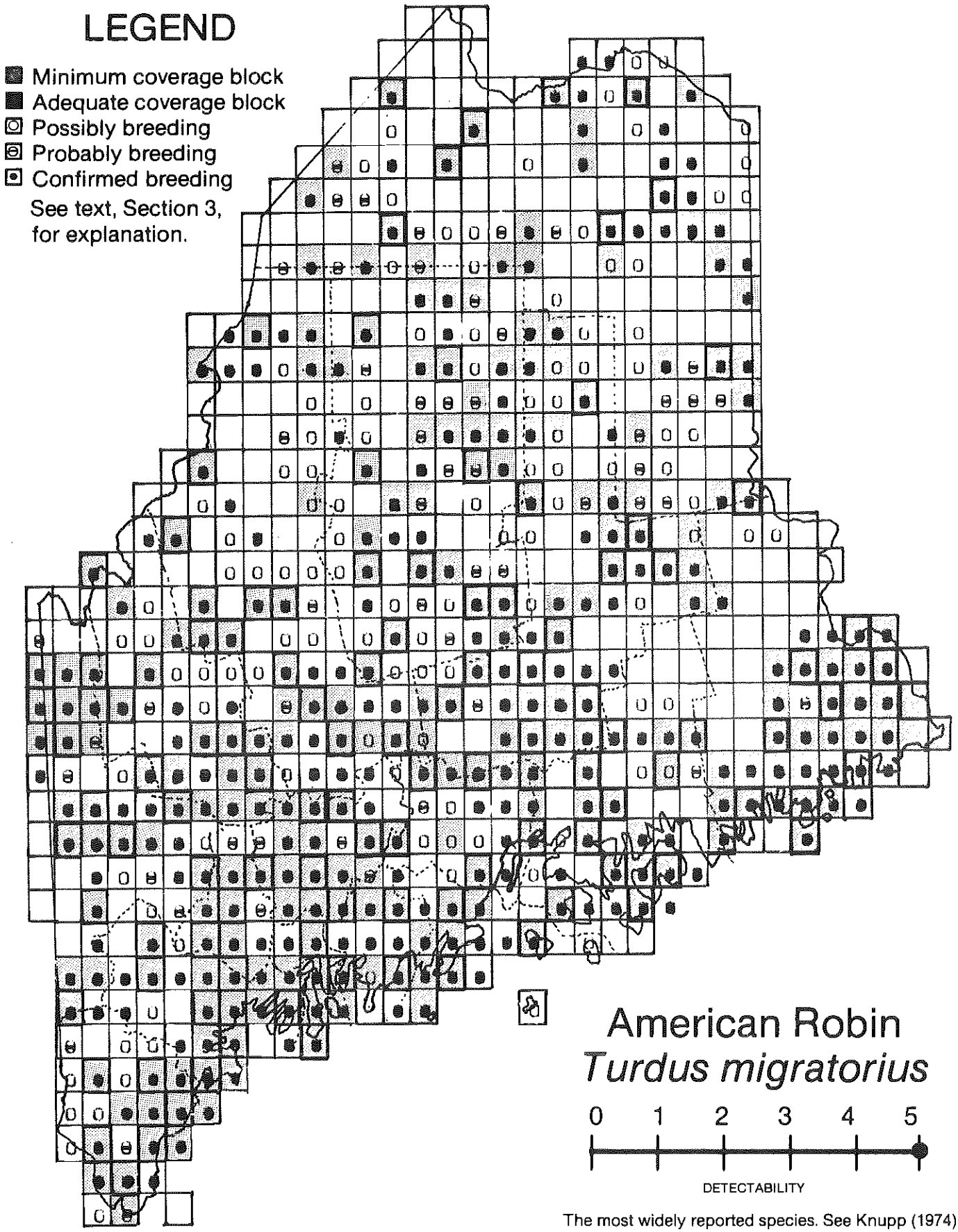


Wood Thrush
Hylocichla mustelina

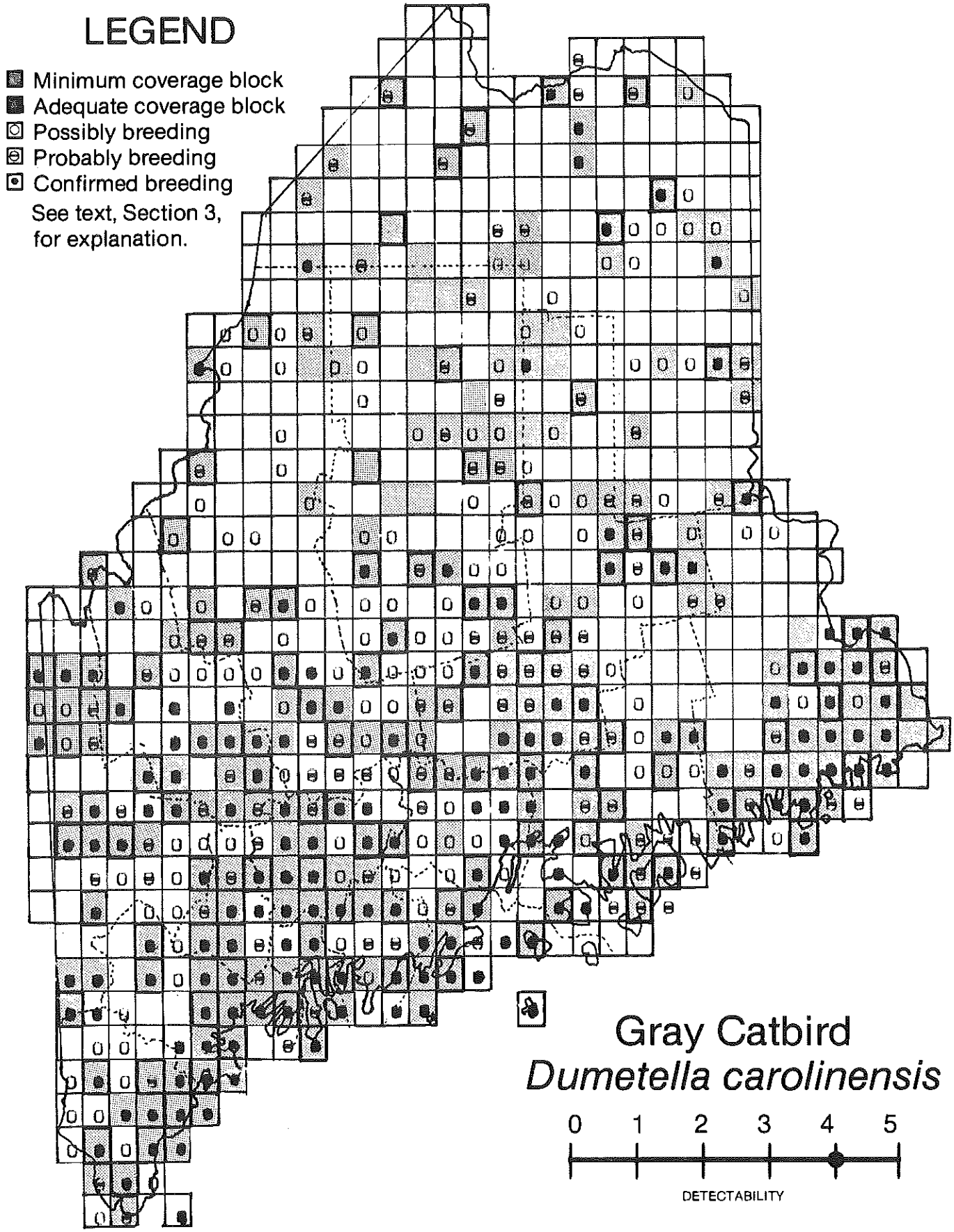
0 1 2 3 4 5

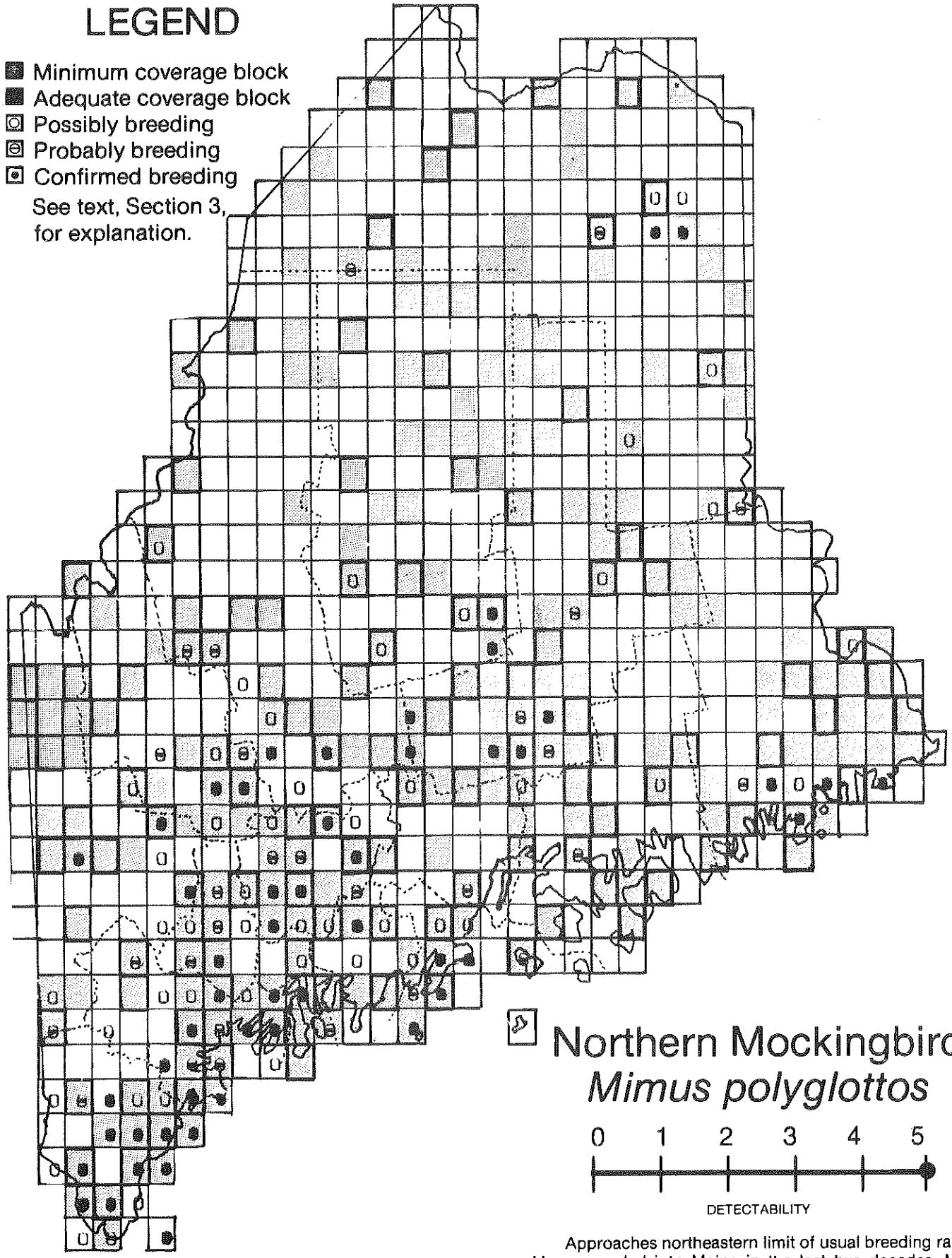
DETECTABILITY

Approaches northern limit of breeding range. Has apparently expanded its range northward over the past few decades.



The most widely reported species. See Knupp (1974).


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Gray Catbird
Dumetella carolinensis
0 1 2 3 4 5
DETECTABILITY

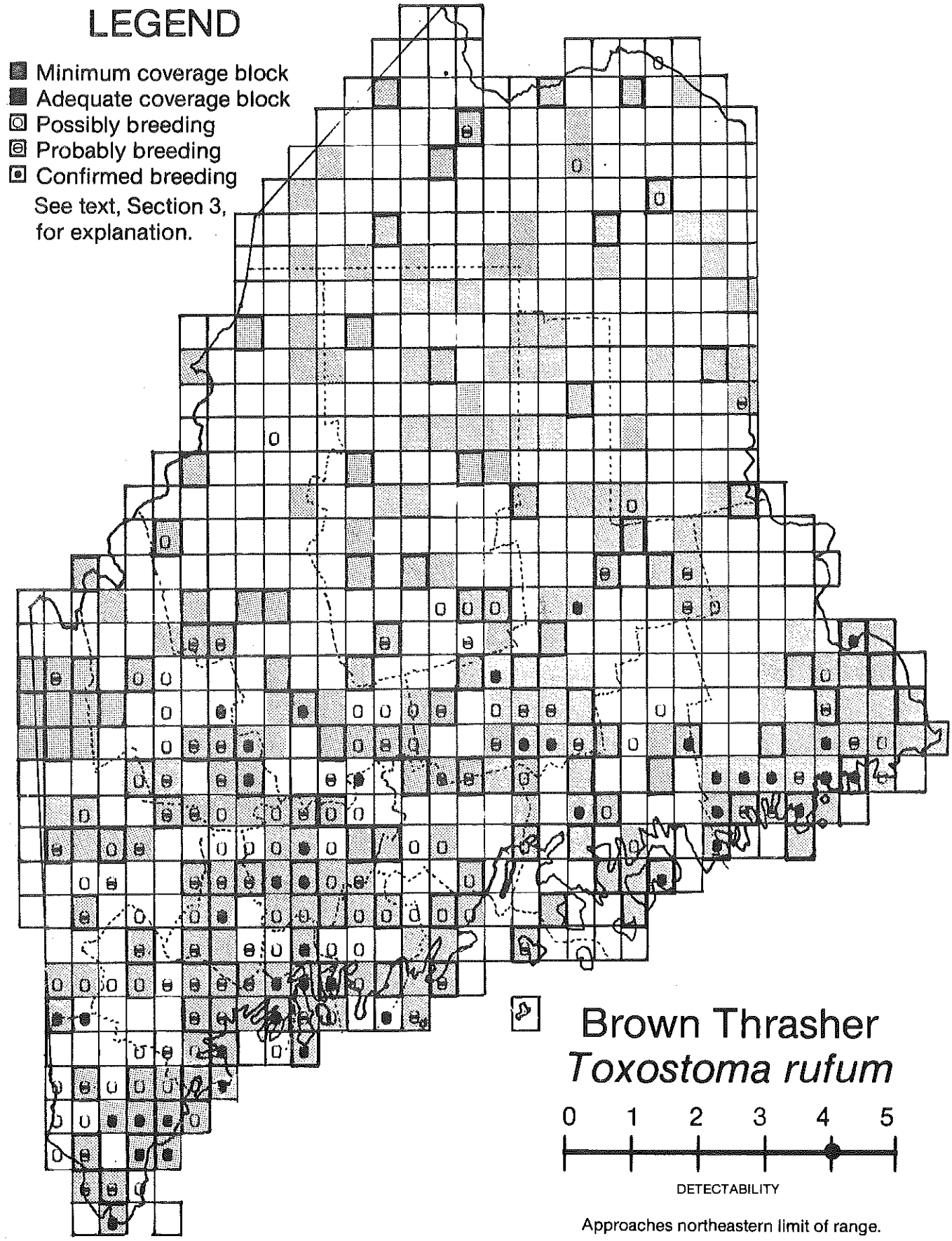


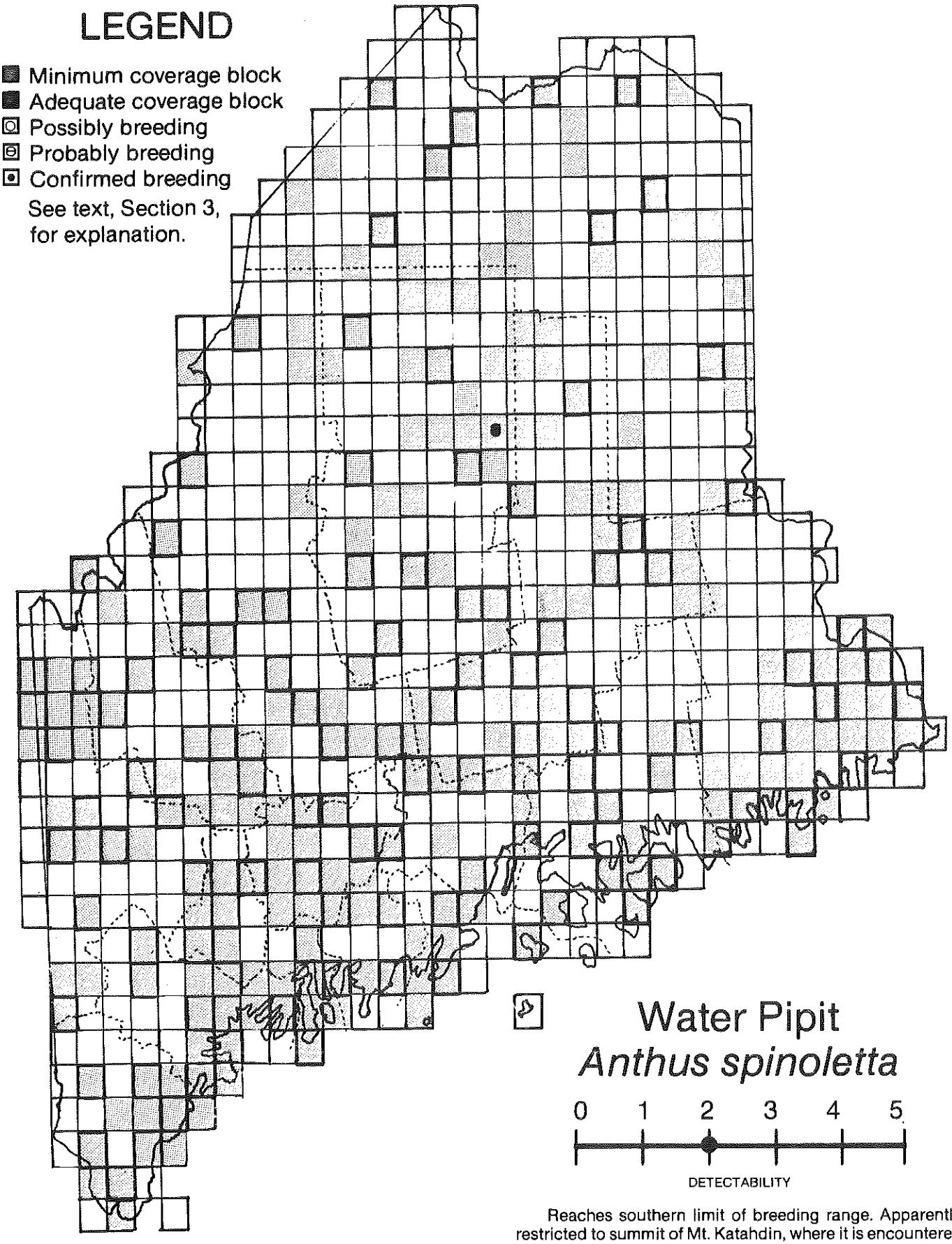
Northern Mockingbird
Mimus polyglottos

0 1 2 3 4 5

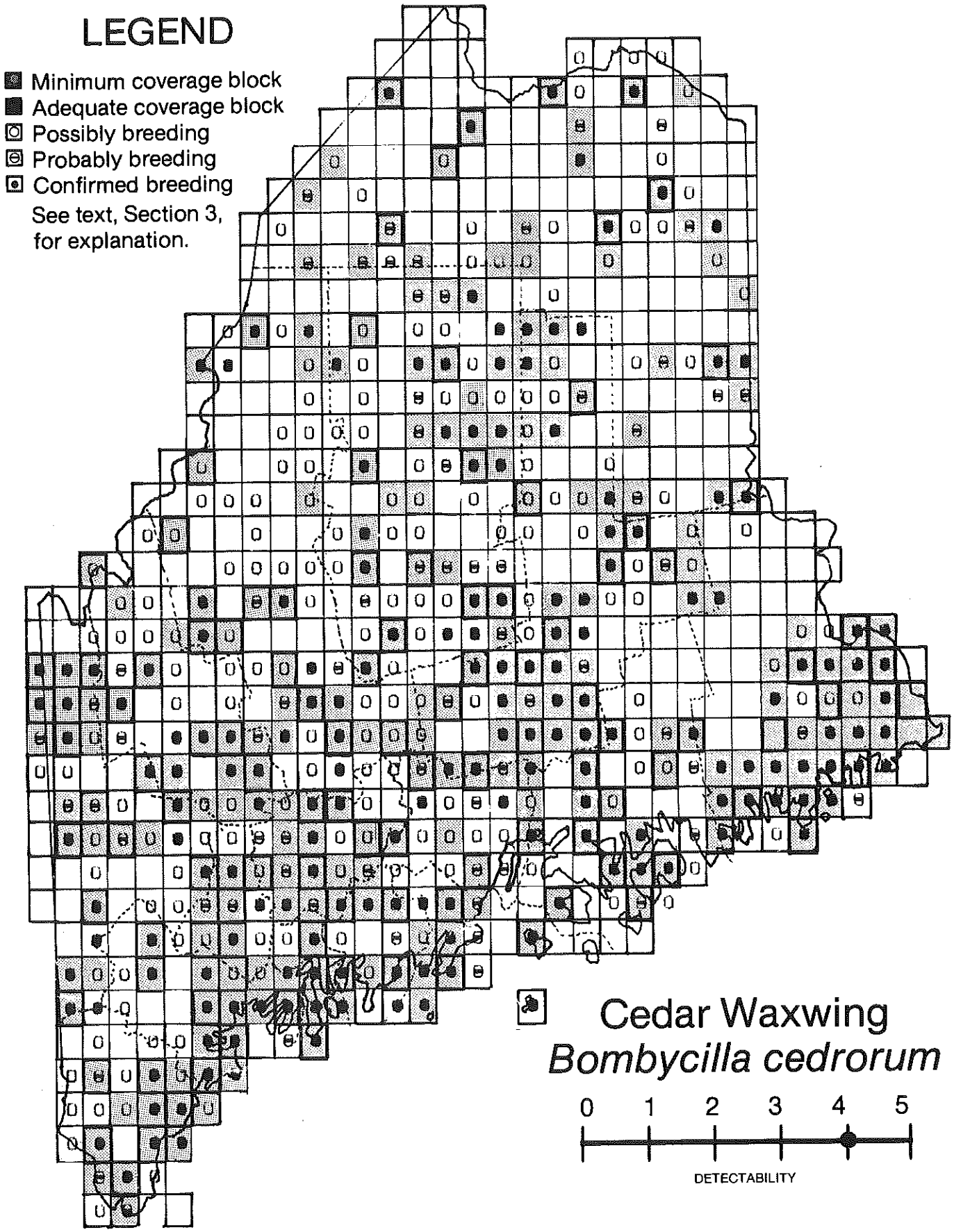
DETECTABILITY

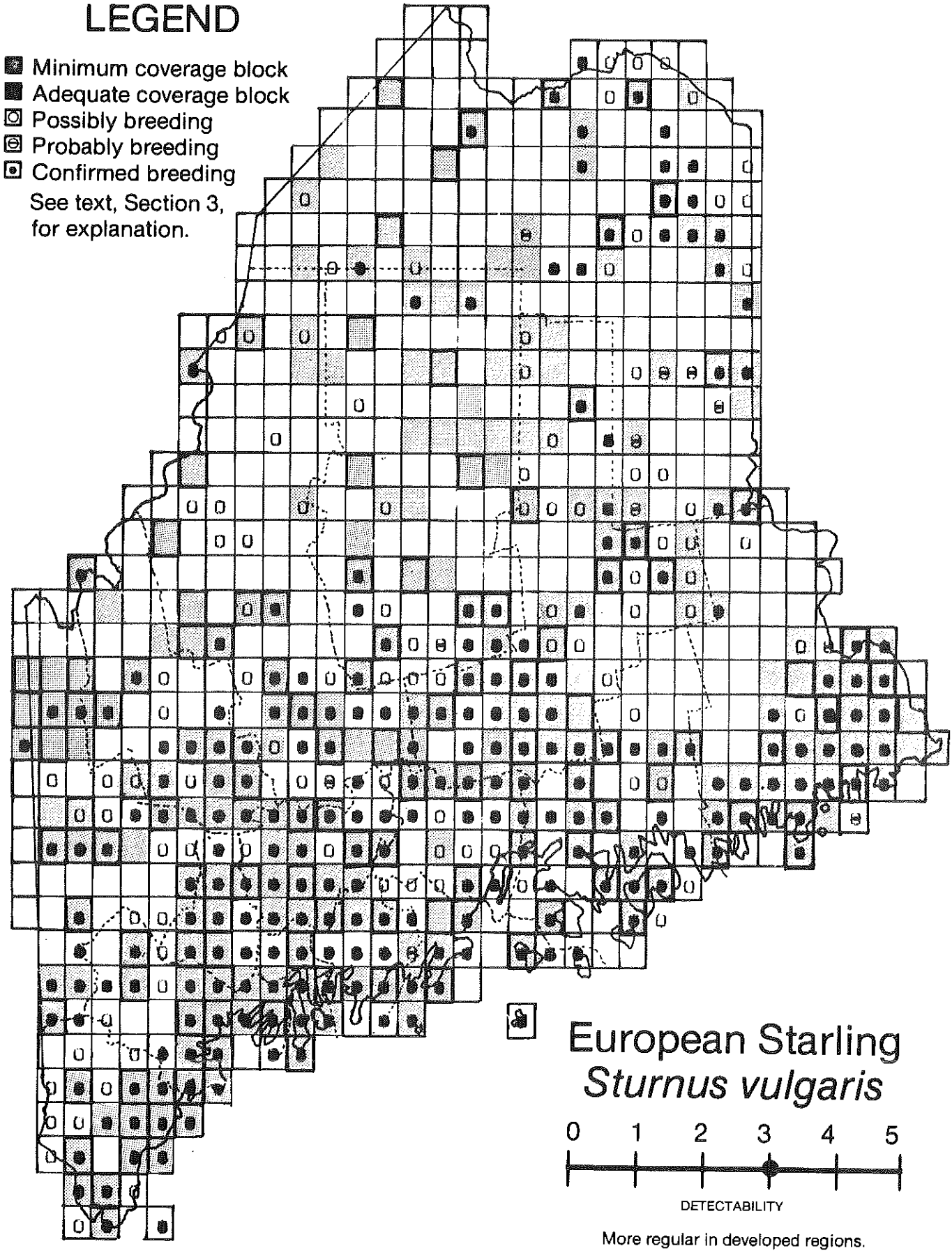
Approaches northeastern limit of usual breeding range. Has expanded into Maine in the last two decades. More regular in developed areas.

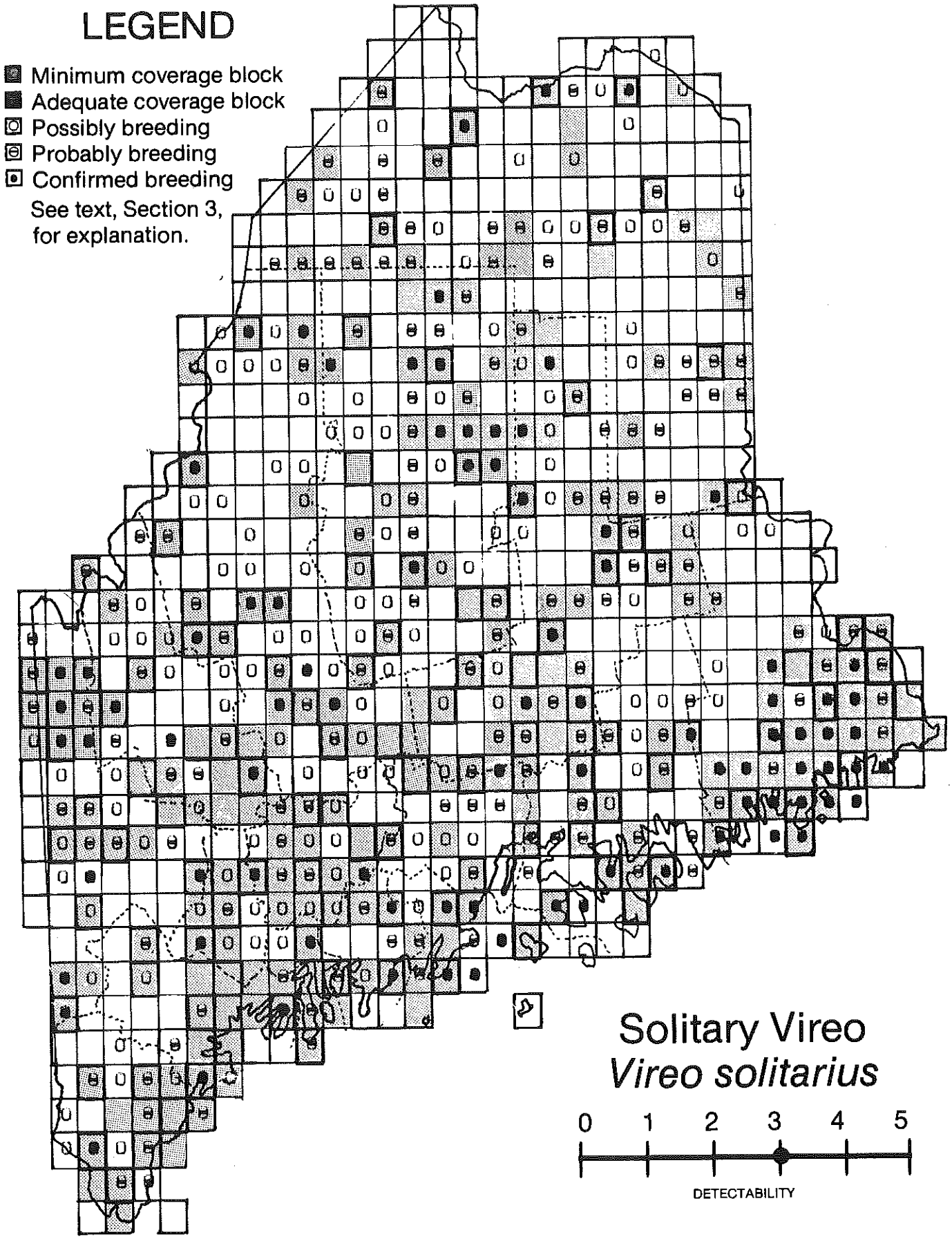

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Brown Thrasher
Toxostoma rufum
0 1 2 3 4 5
DETECTABILITY
Approaches northeastern limit of range.

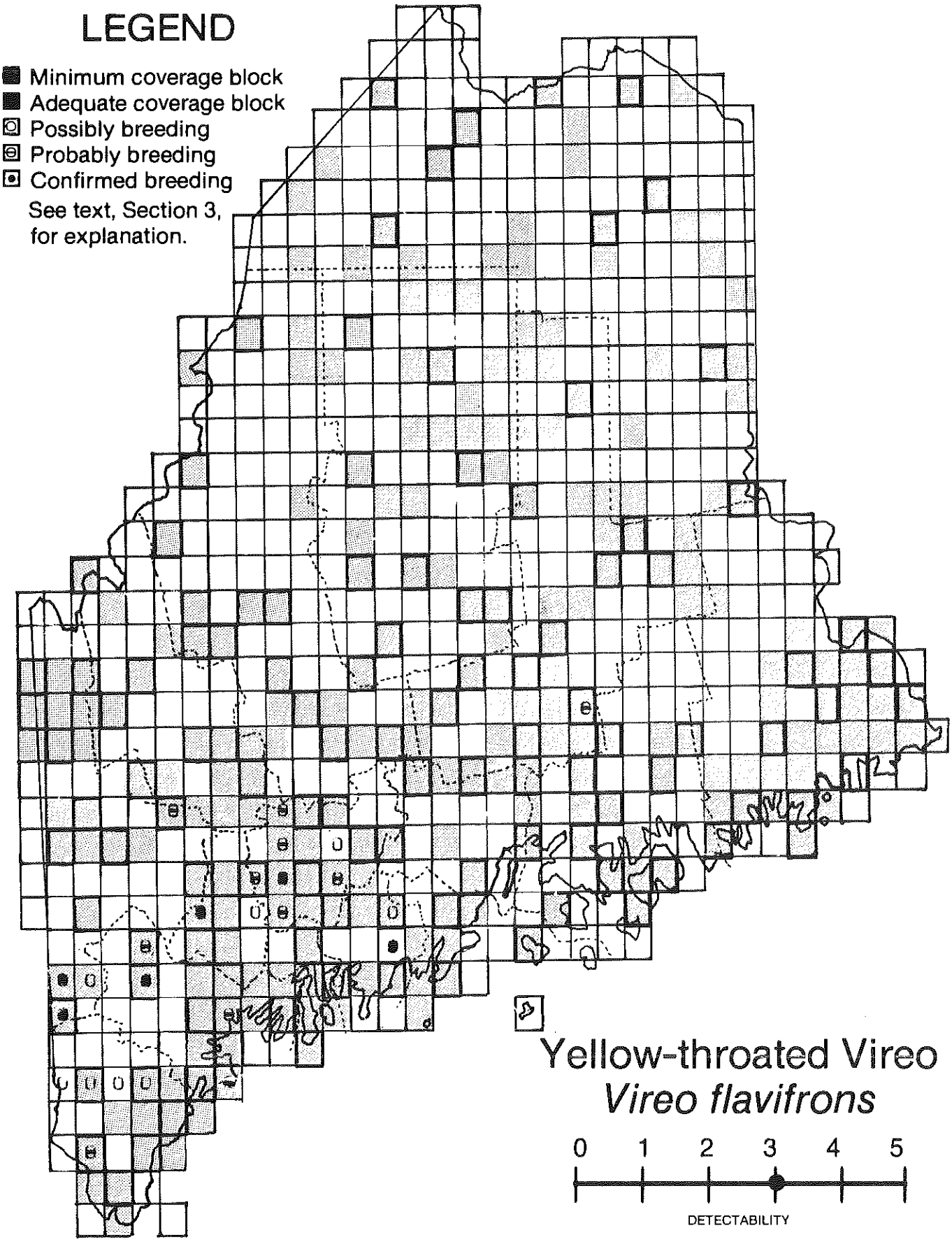


Reaches southern limit of breeding range. Apparently restricted to summit of Mt. Katahdin, where it is encountered regularly.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Cedar Waxwing
Bombycilla cedrorum
0 1 2 3 4 5
DETECTABILITY


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
European Starling
Sturnus vulgaris
0 1 2 3 4 5
DETECTABILITY
More regular in developed regions.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Solitary Vireo
Vireo solitarius
0 1 2 3 4 5
DETECTABILITY

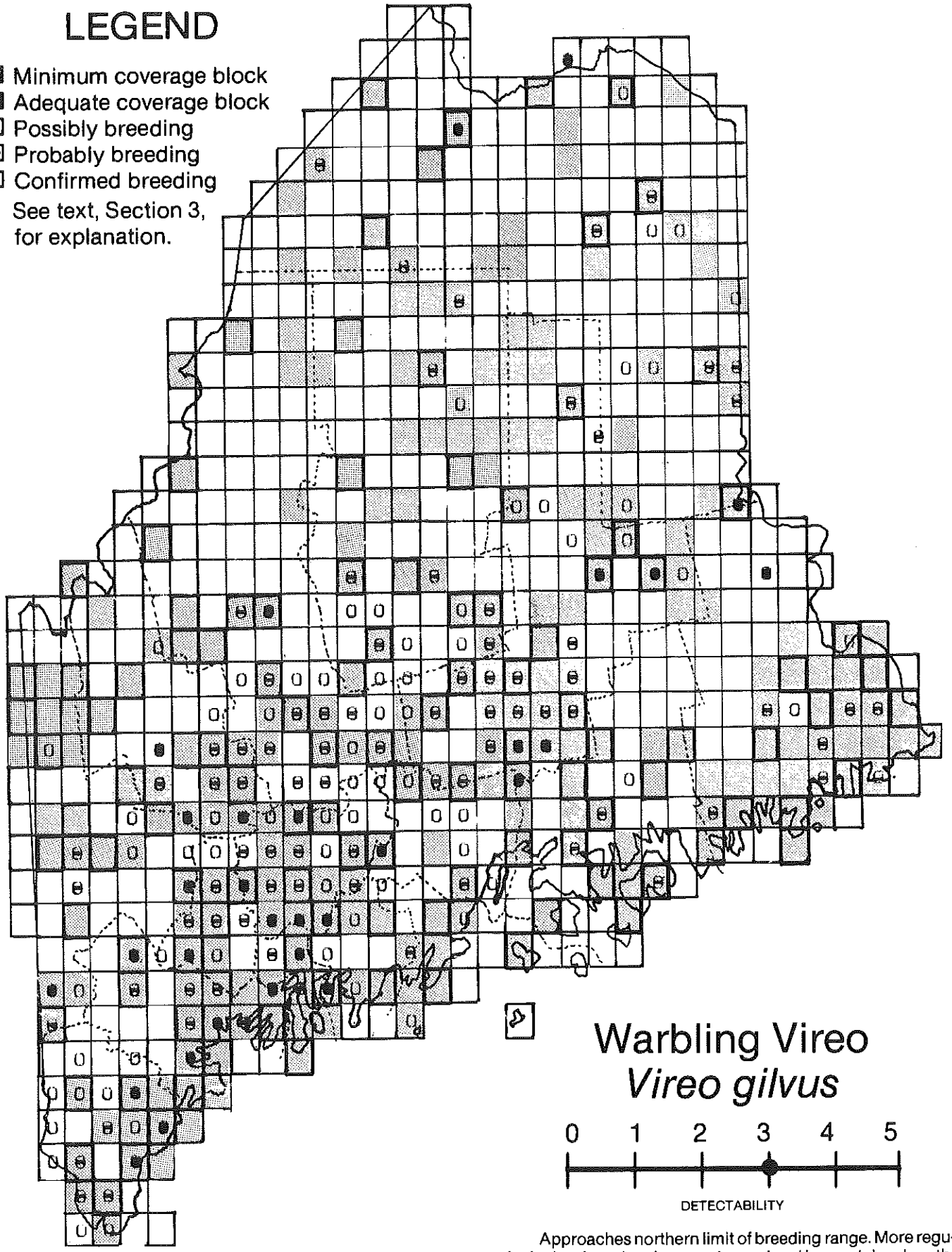


Yellow-throated Vireo
Vireo flavifrons

0 1 2 3 4 5

DETECTABILITY

Reaches northern limit of breeding range. Generally confined to southwestern part of the state.

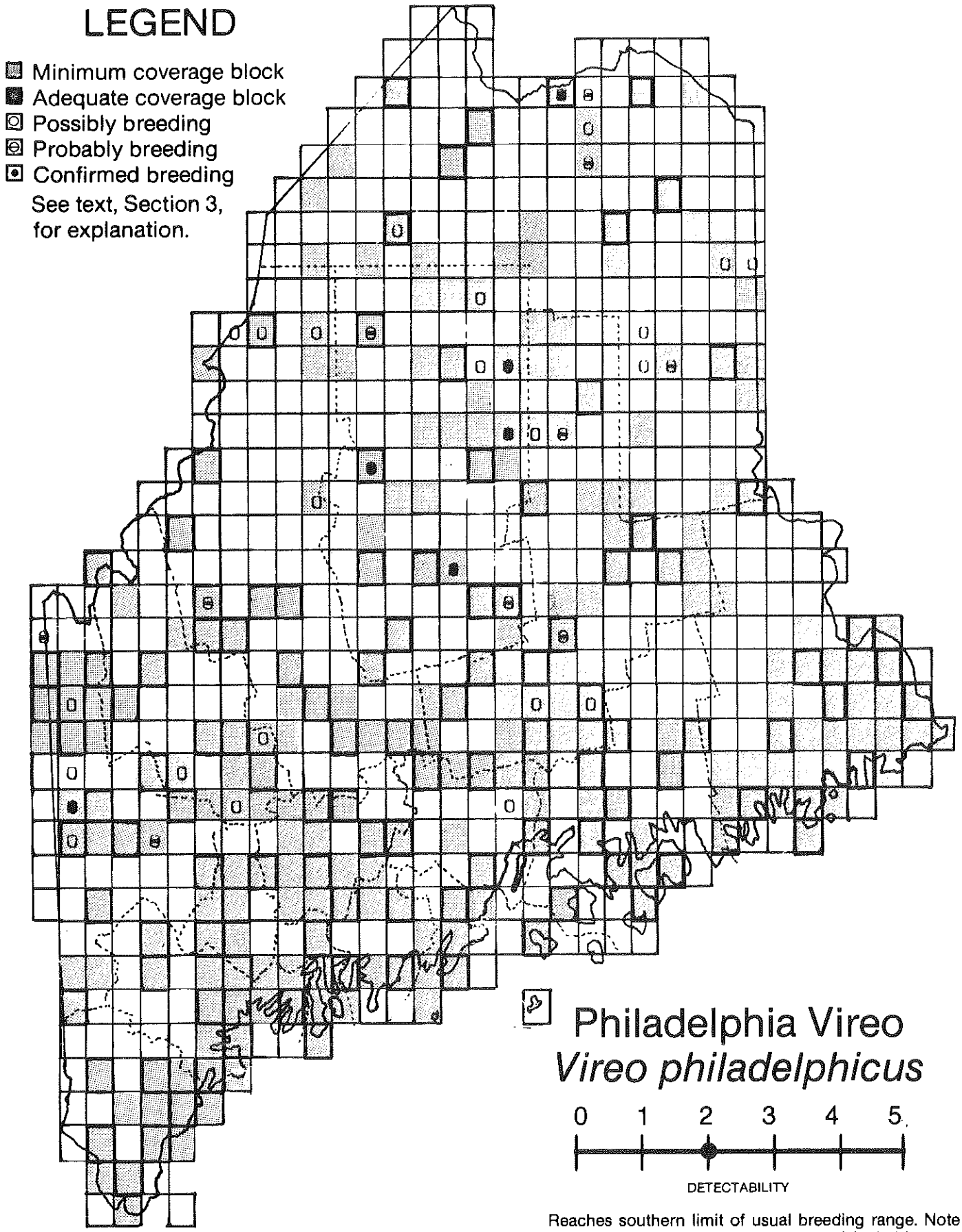


Warbling Vireo
Vireo gilvus

0 1 2 3 4 5

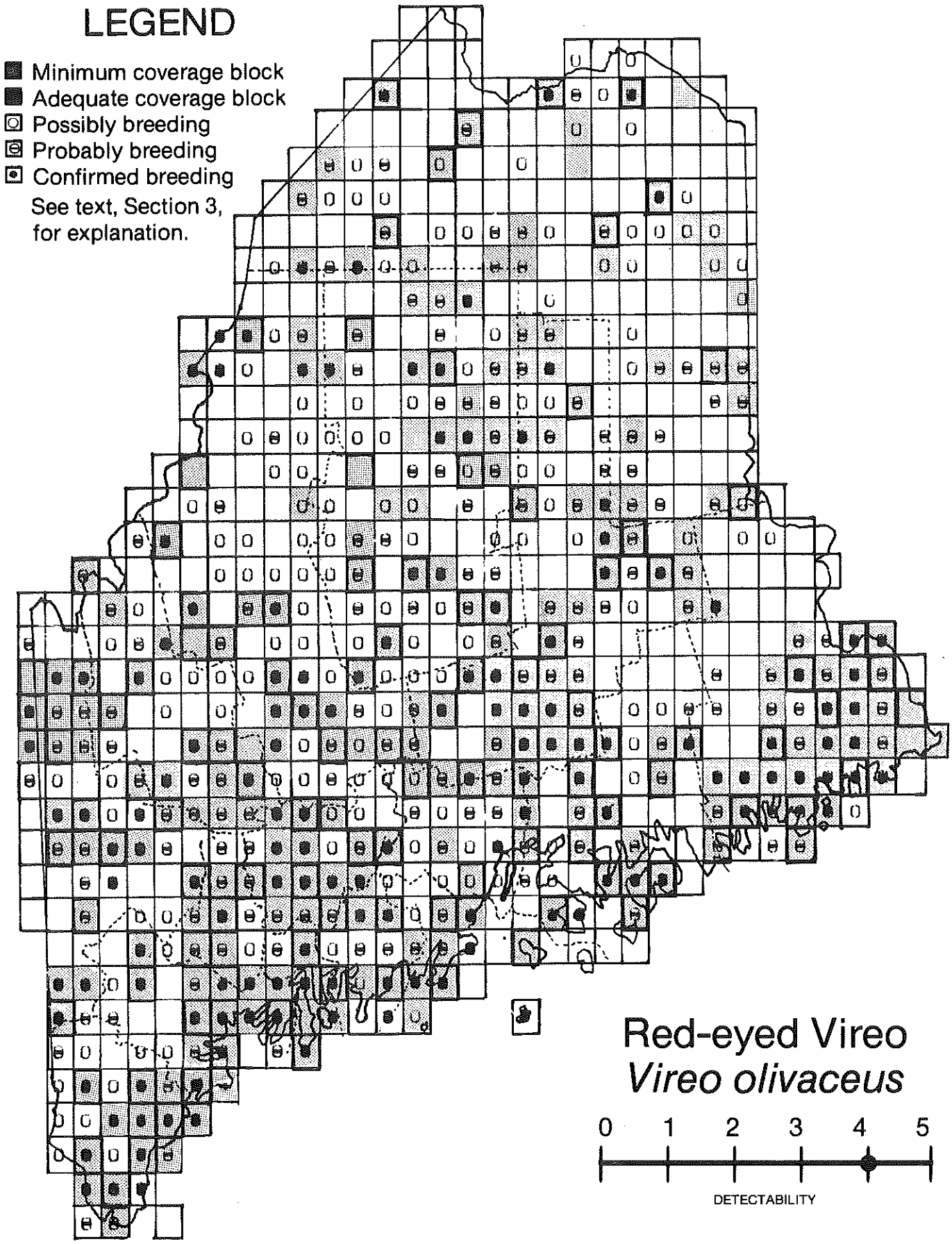
DETECTABILITY

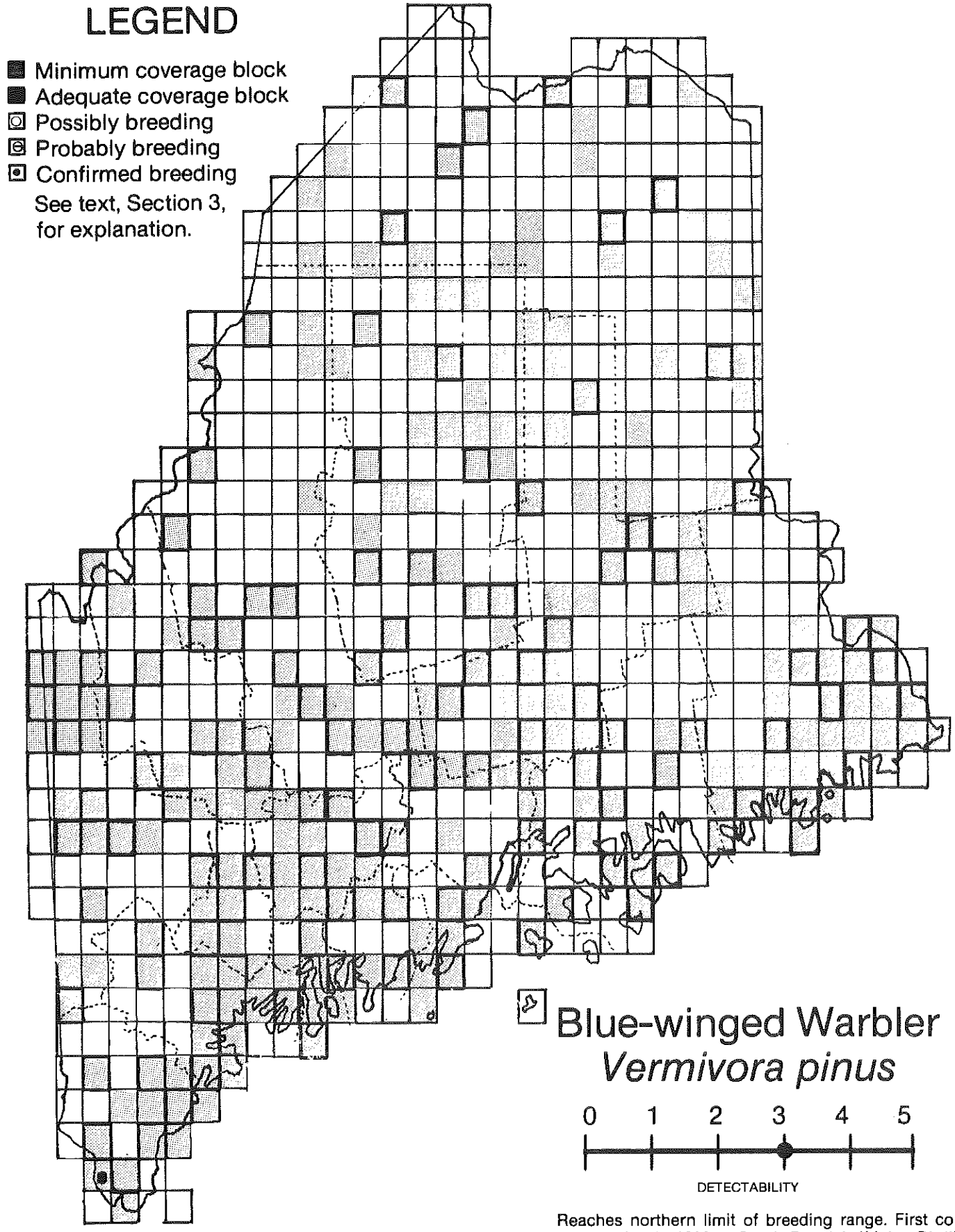
Approaches northern limit of breeding range. More regular in developed regions, and more local in coastal and northern parts of the state.



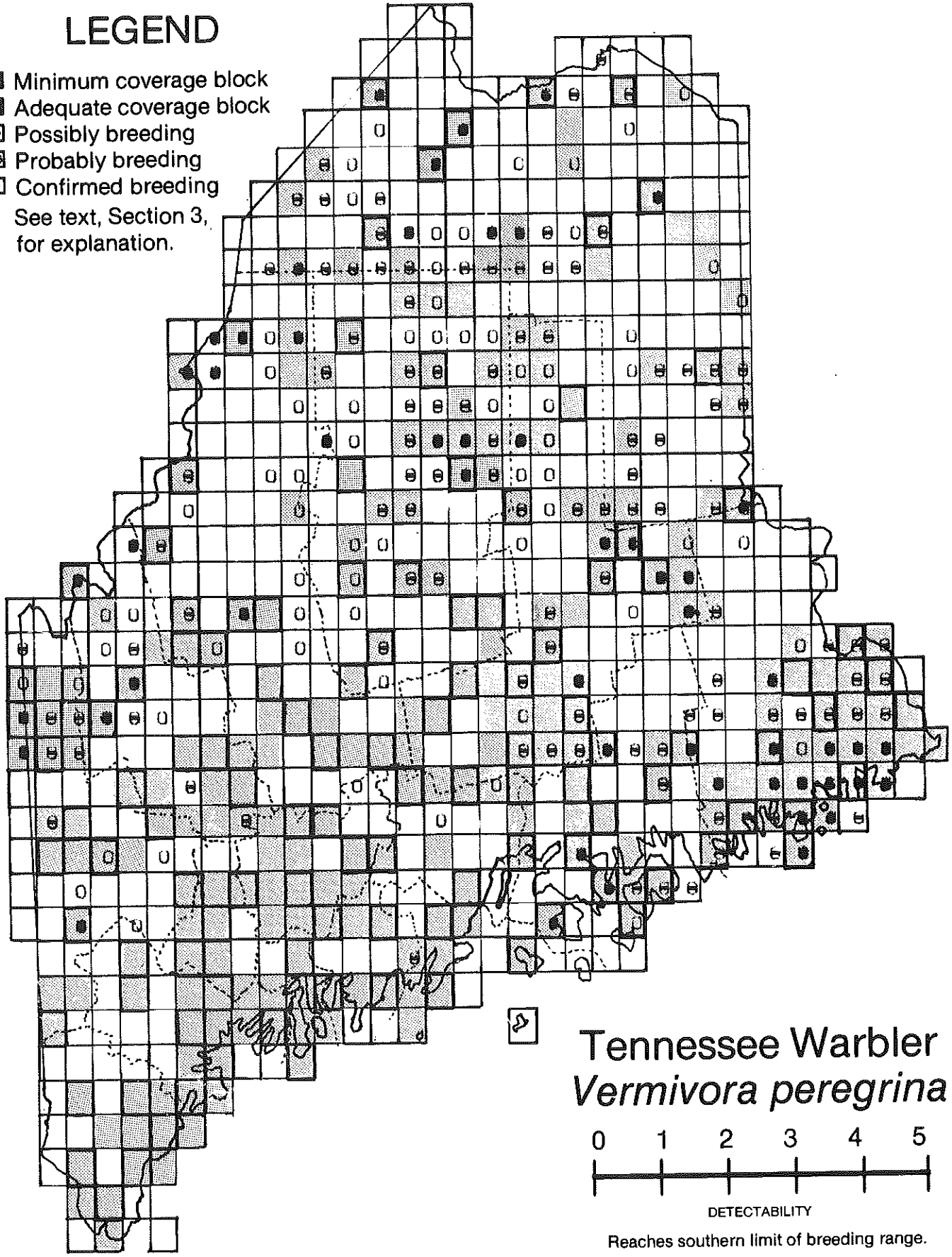
Philadelphia Vireo
Vireo philadelphicus

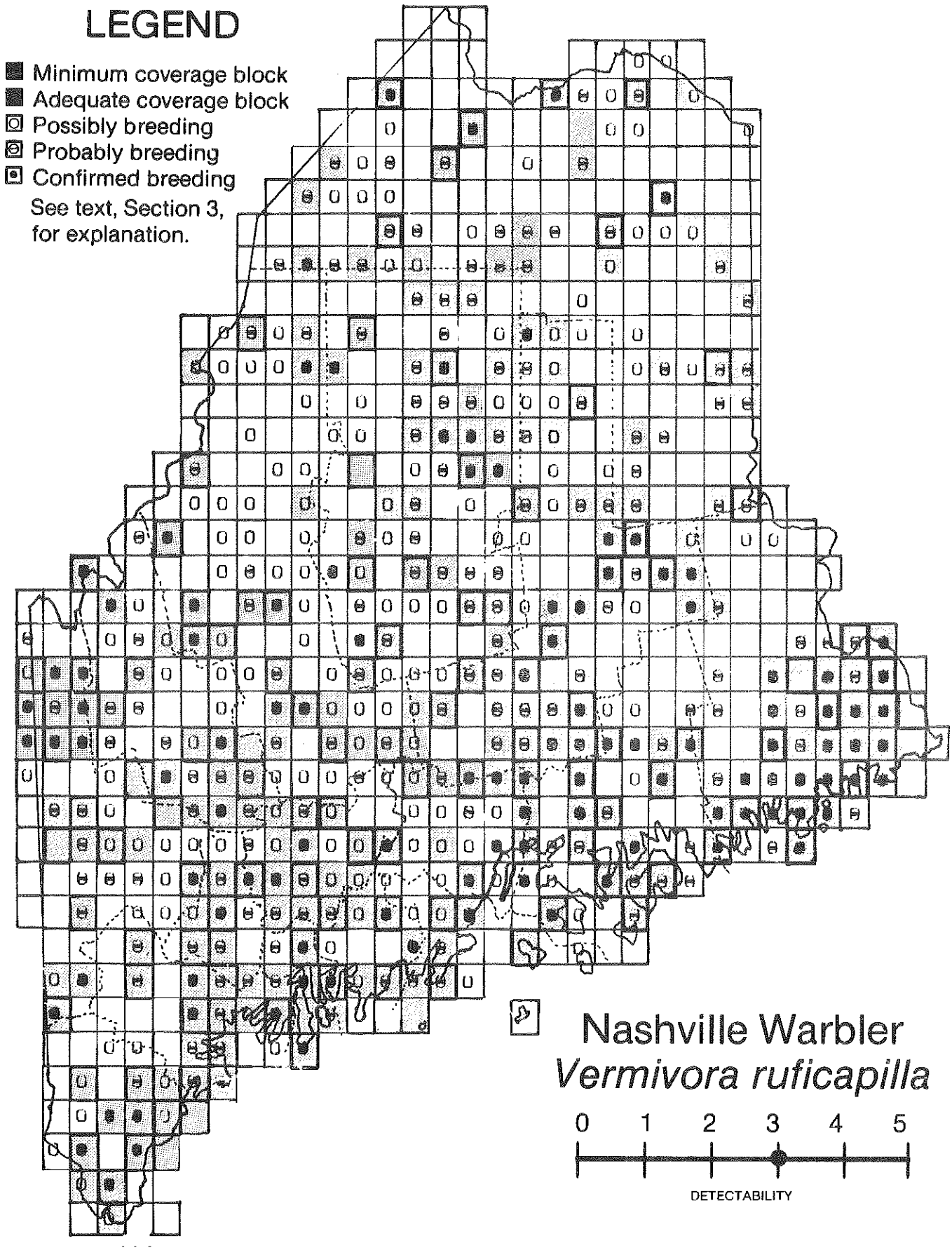
Reaches southern limit of usual breeding range. Note low detectability score. See Robinson (1981) for habitat and behavior information.

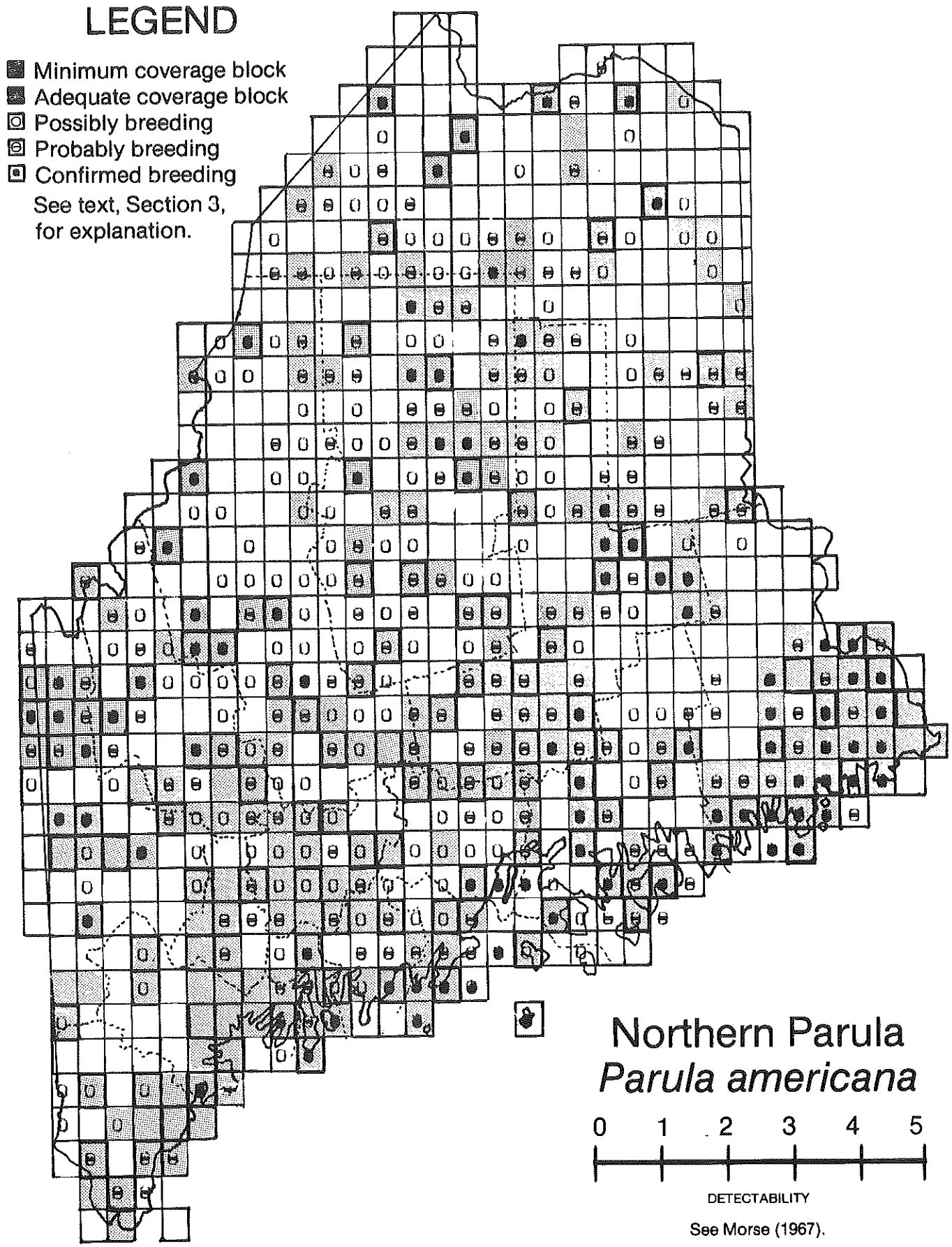

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Red-eyed Vireo
Vireo olivaceus
0 1 2 3 4 5
DETECTABILITY

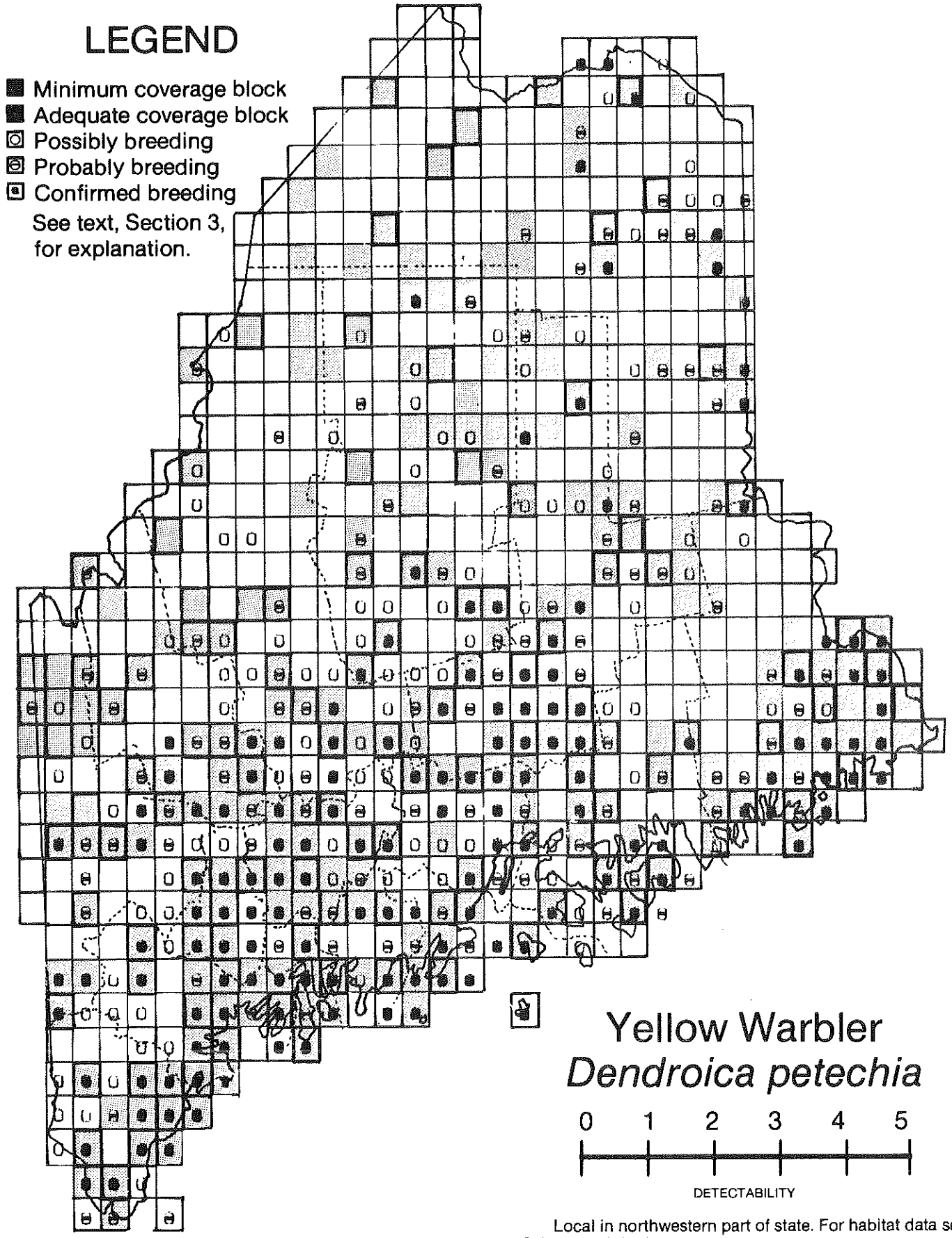


Reaches northern limit of breeding range. First confirmed breeding in 1980 at South Berwick (*Maine Birdlife* 2:42).

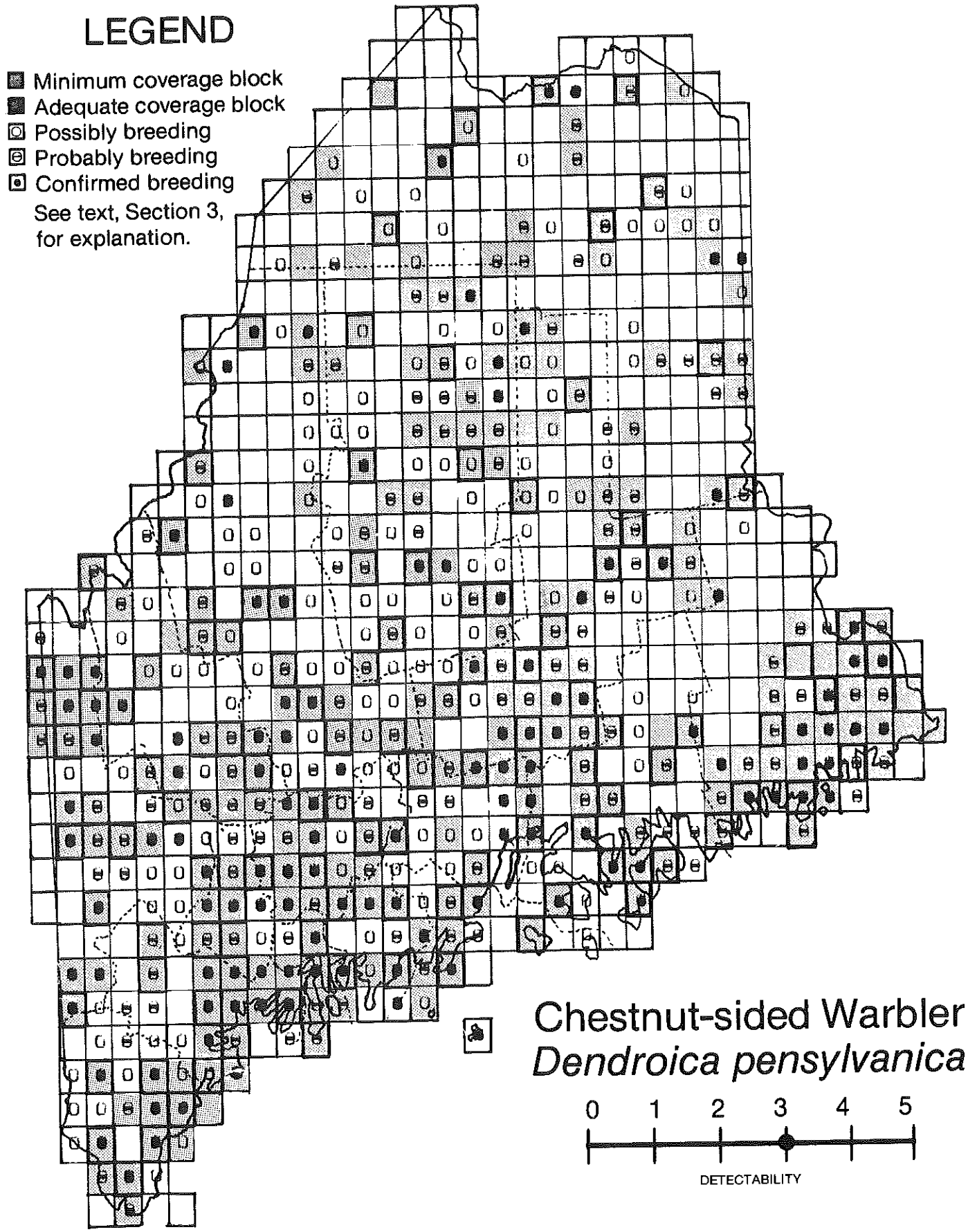

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Tennessee Warbler
Vermivora peregrina
0 1 2 3 4 5
DETECTABILITY
Reaches southern limit of breeding range.

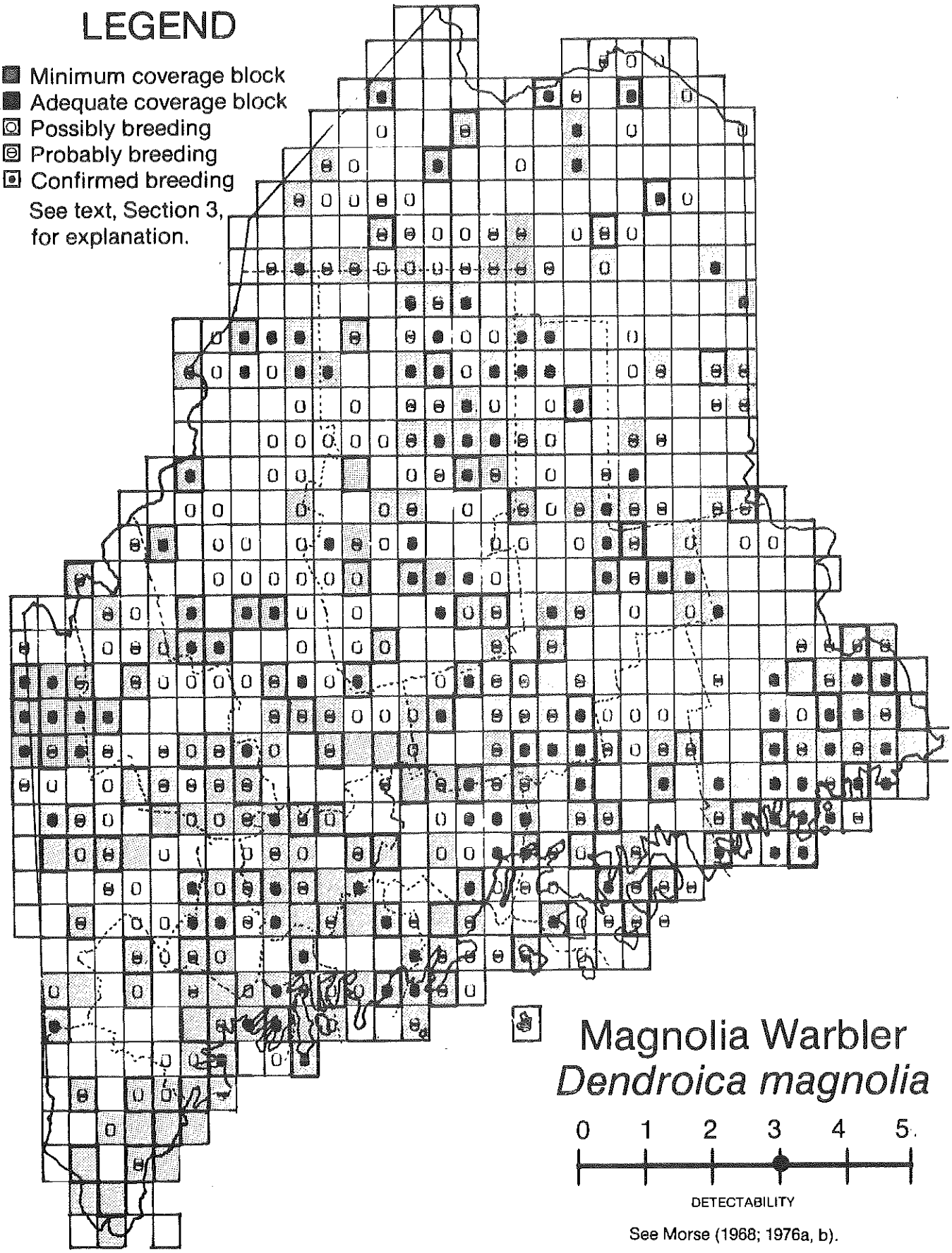

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Nashville Warbler
Vermivora ruficapilla
0 1 2 3 4 5
DETECTABILITY

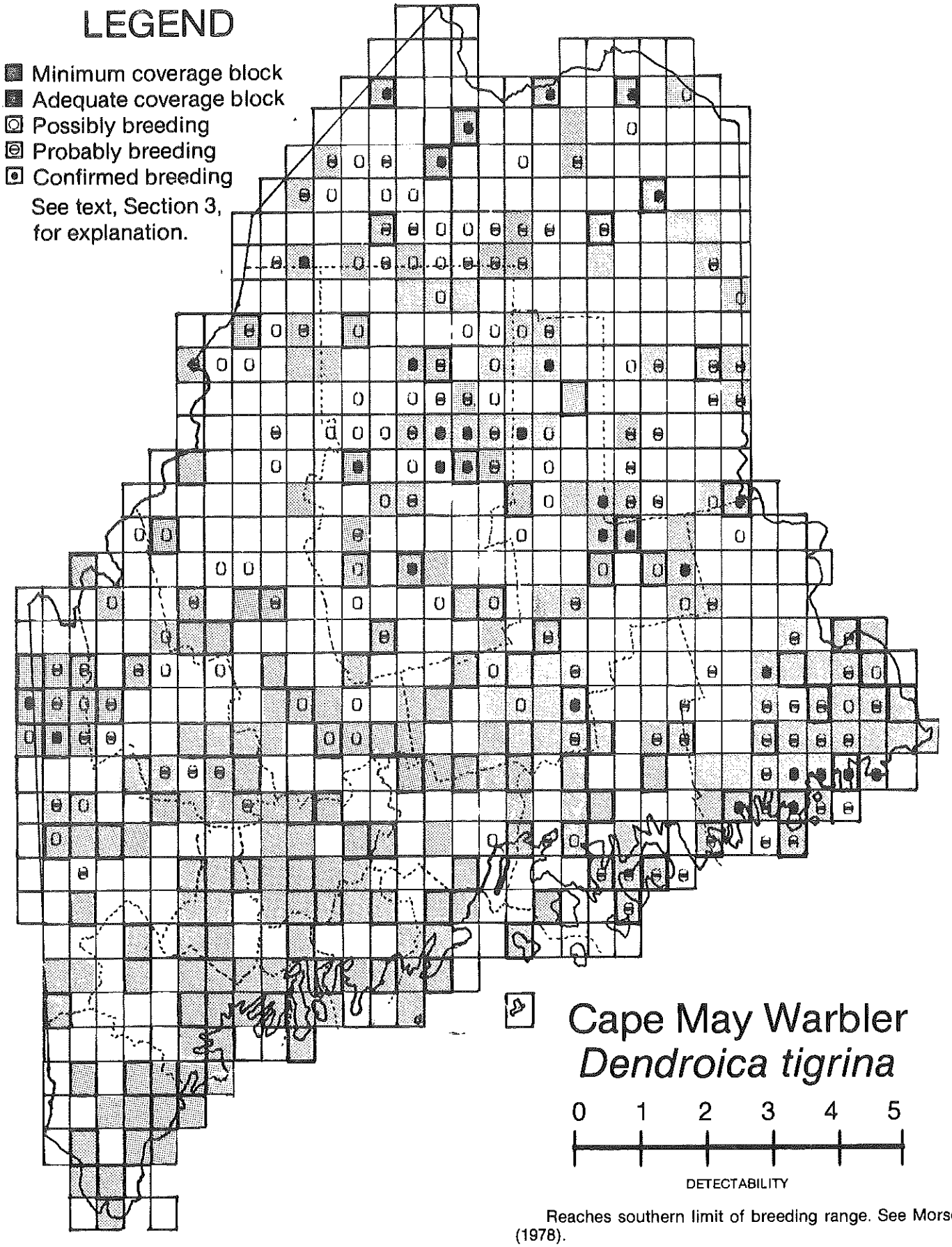

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Northern Parula
Parula americana
0 1 2 3 4 5
DETECTABILITY
See Morse (1967).



Local in northwestern part of state. For habitat data see Schroeder (1982).


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Chestnut-sided Warbler
Dendroica pensylvanica
0 1 2 3 4 5
DETECTABILITY


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Magnolia Warbler
Dendroica magnolia
0 1 2 3 4 5
DETECTABILITY
See Morse (1968; 1976a, b).

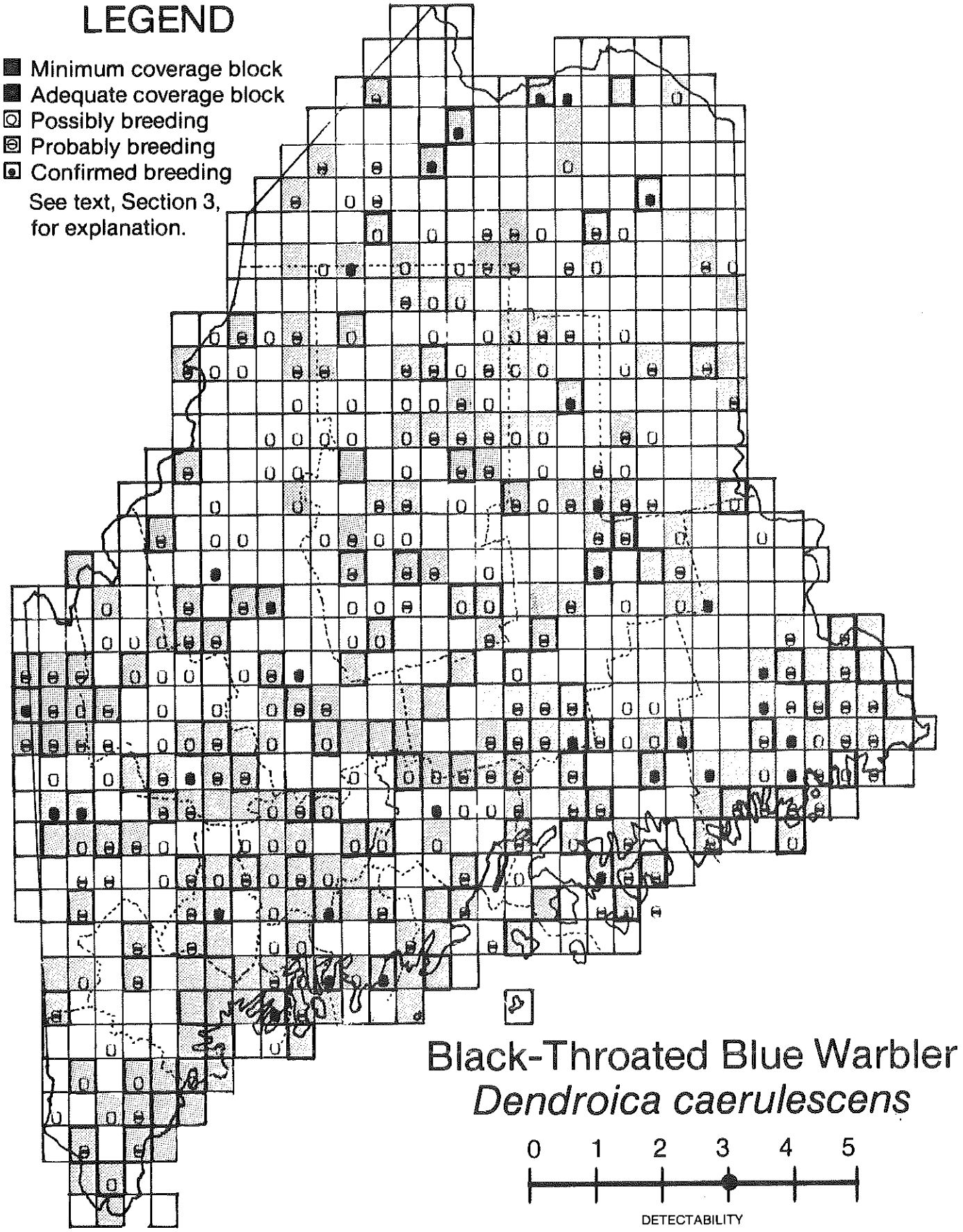


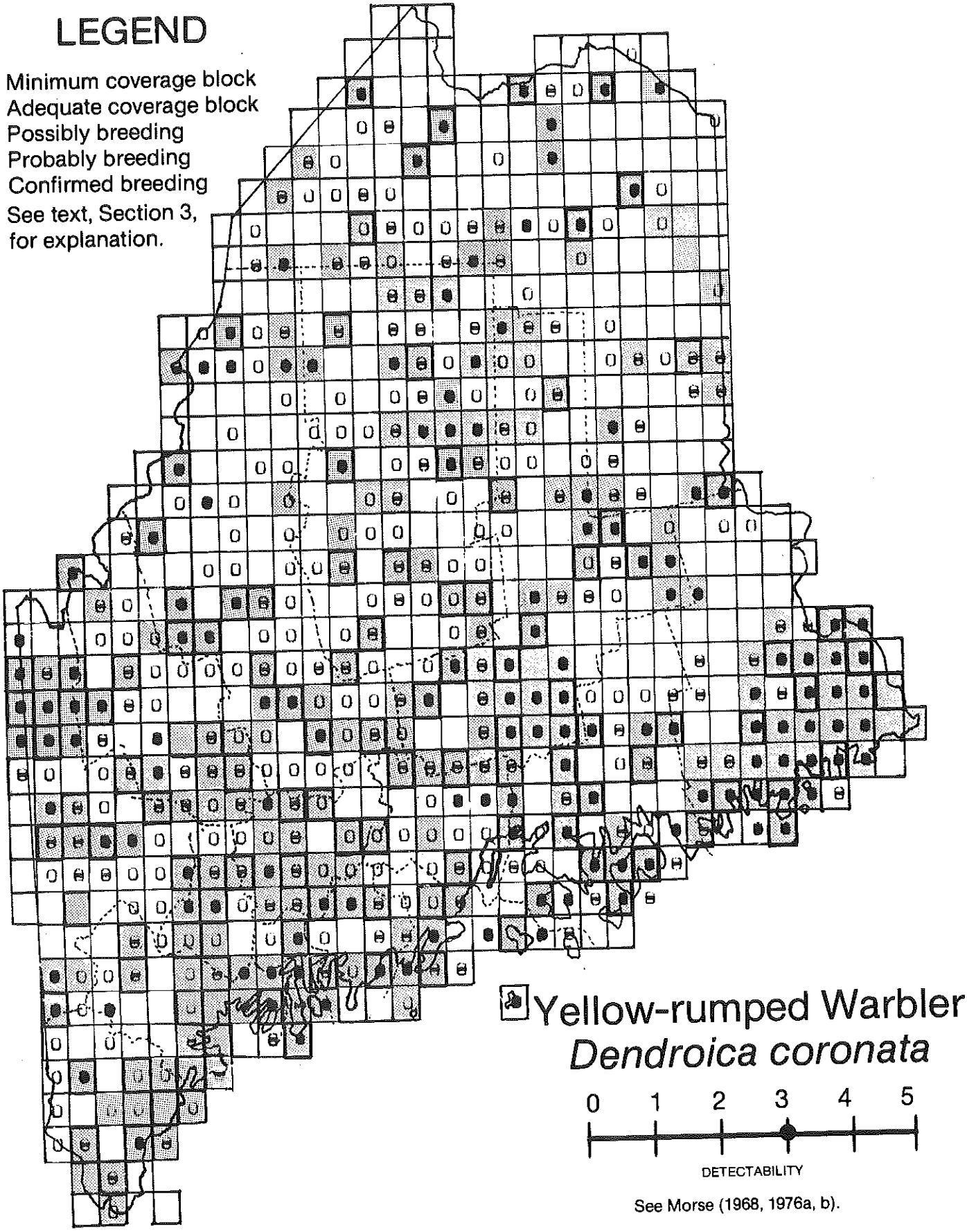
Cape May Warbler
Dendroica tigrina

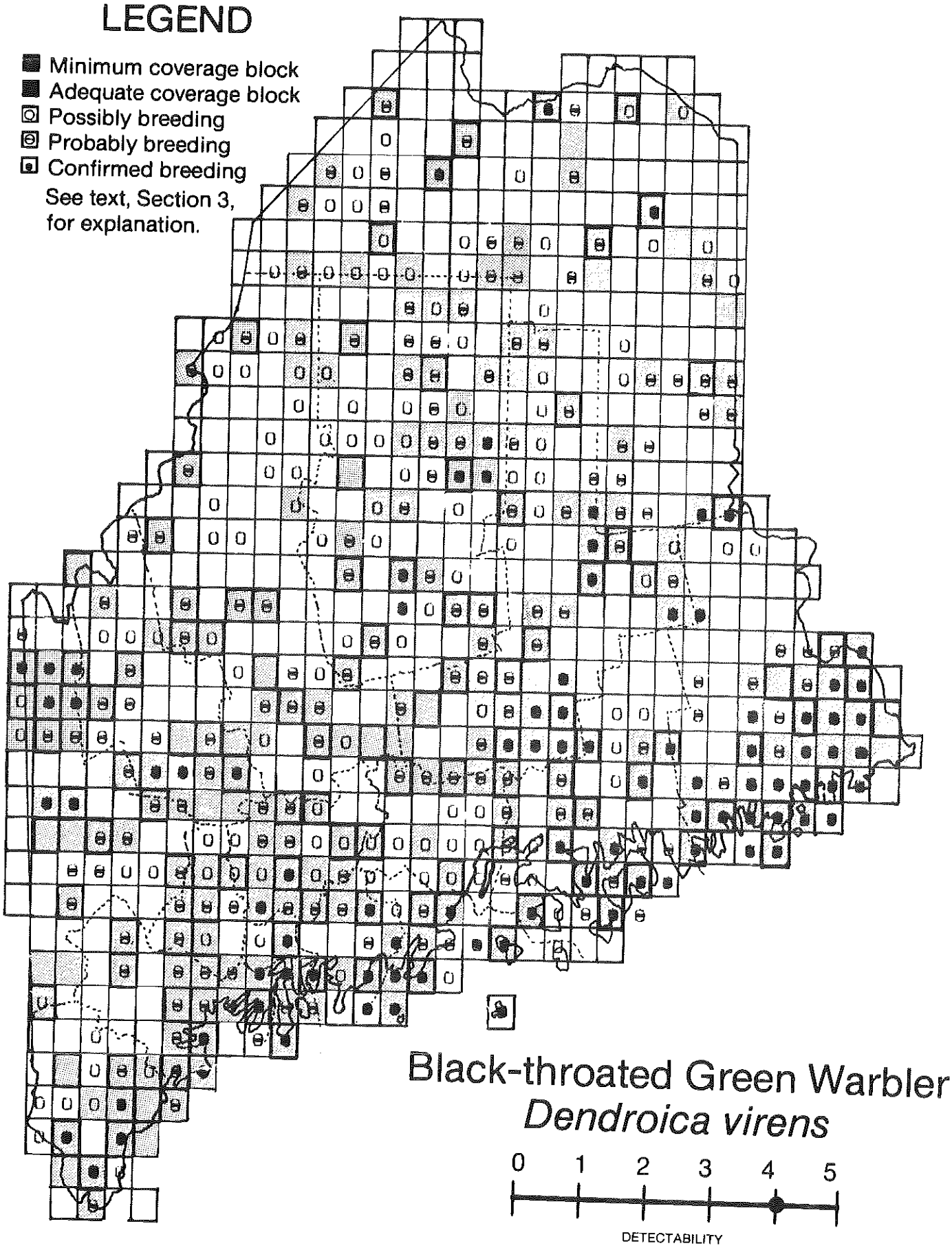
0 1 2 3 4 5

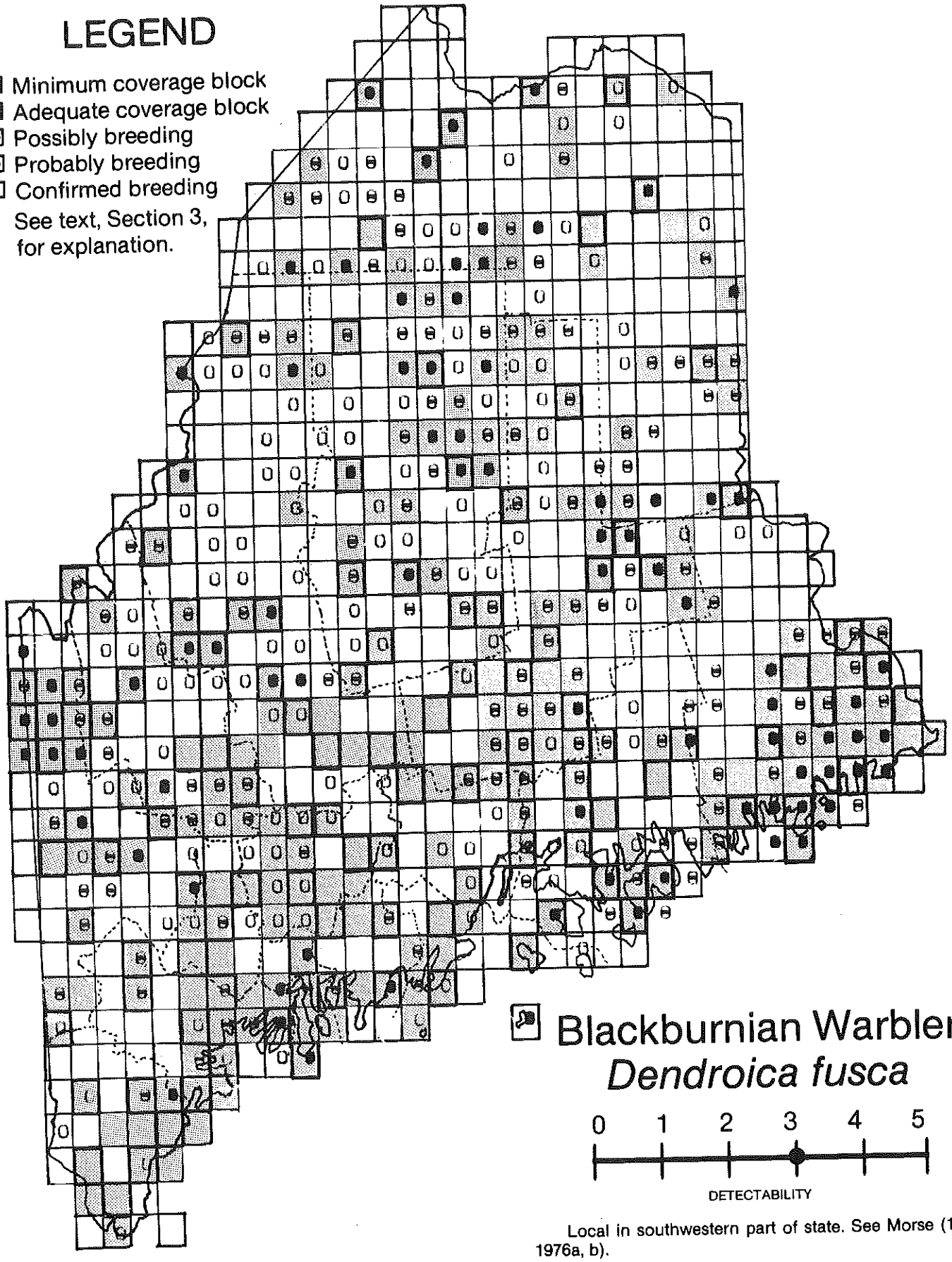
DETECTABILITY

Reaches southern limit of breeding range. See Morse (1978).

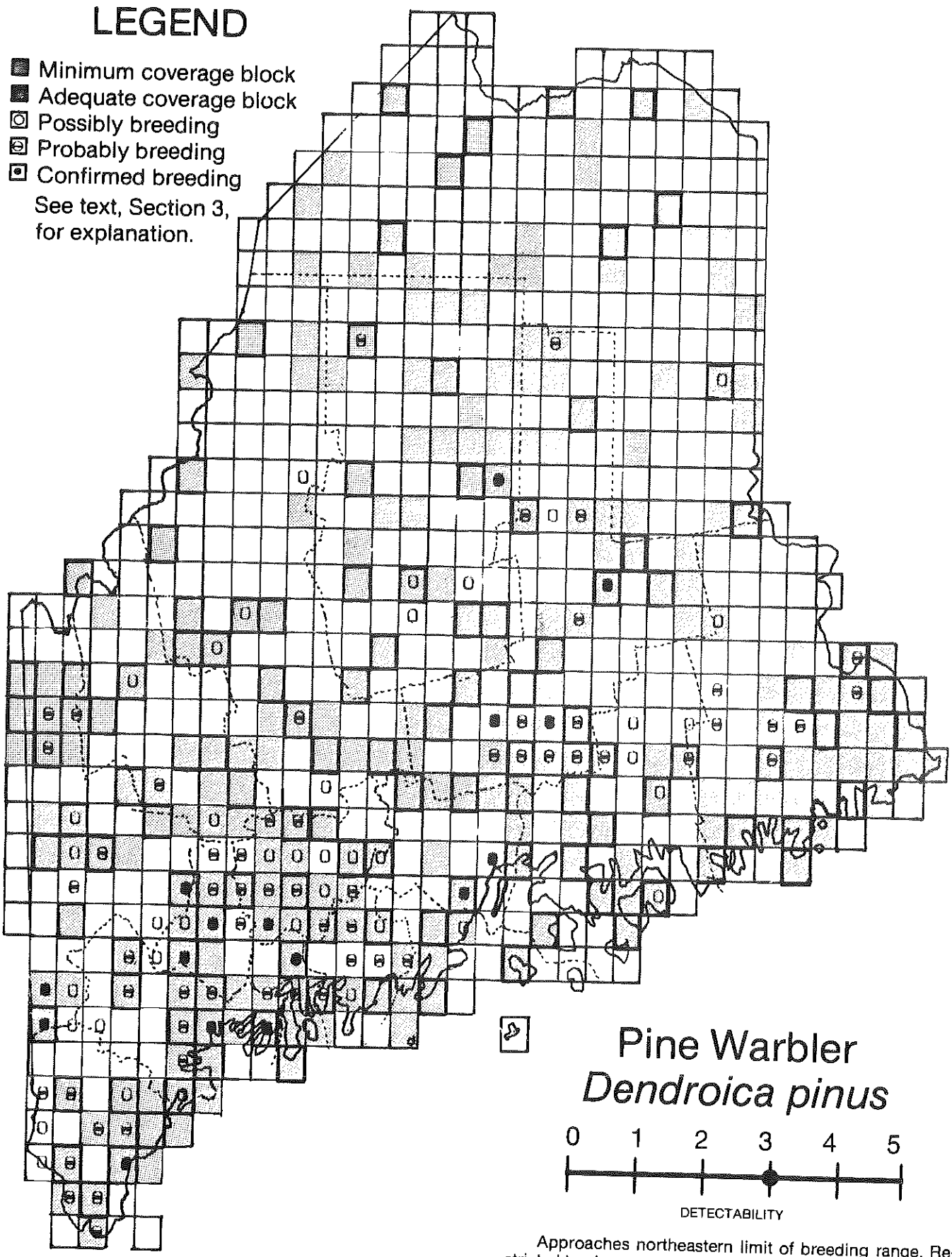

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Black-Throated Blue Warbler
Dendroica caerulescens
0 1 2 3 4 5
DETECTABILITY


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Yellow-rumped Warbler
Dendroica coronata
0 1 2 3 4 5
DETECTABILITY
See Morse (1968, 1976a, b).

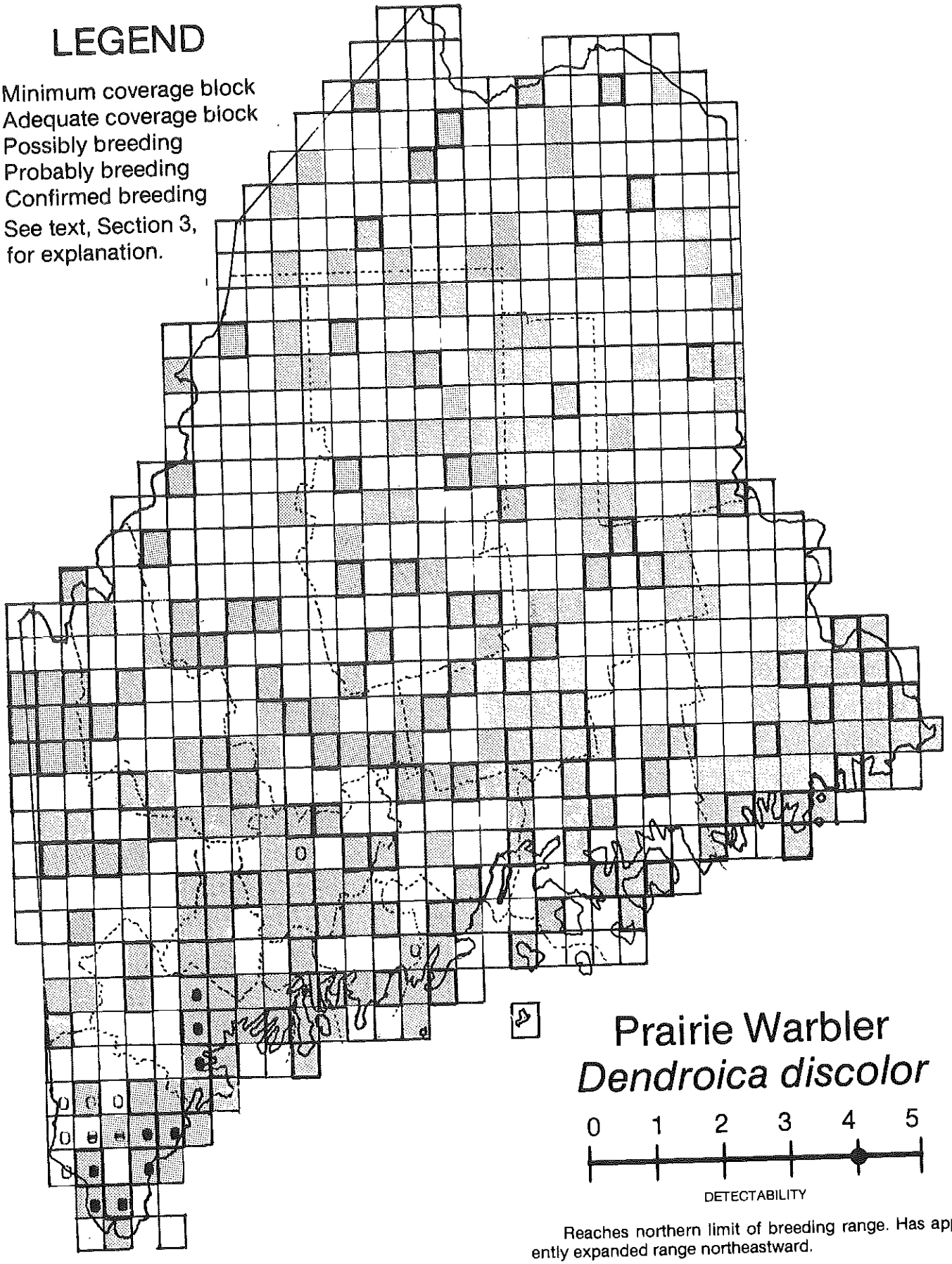

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Black-throated Green Warbler
Dendroica virens
0 1 2 3 4 5
DETECTABILITY



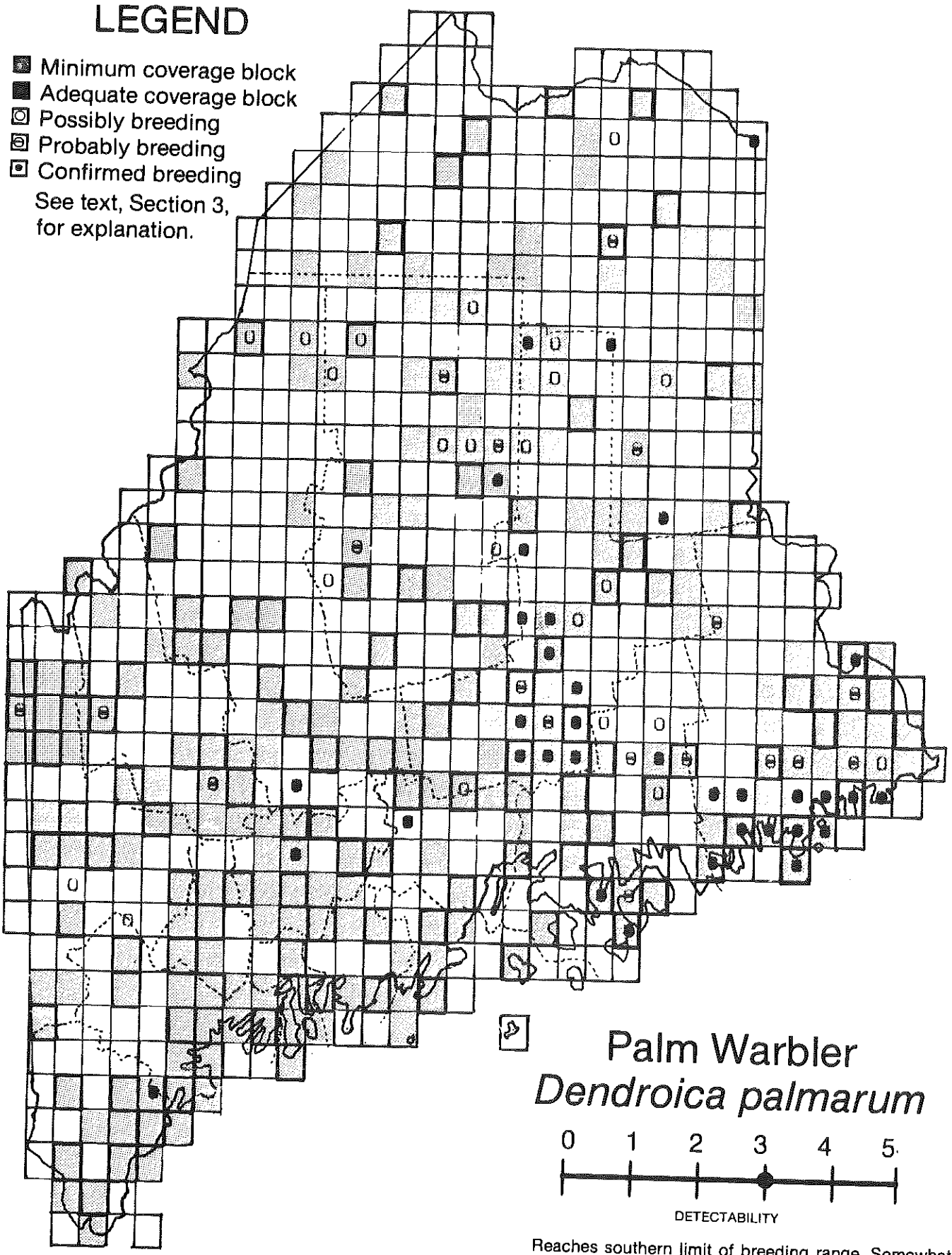
Local in southwestern part of state. See Morse (1968, 1976a, b).



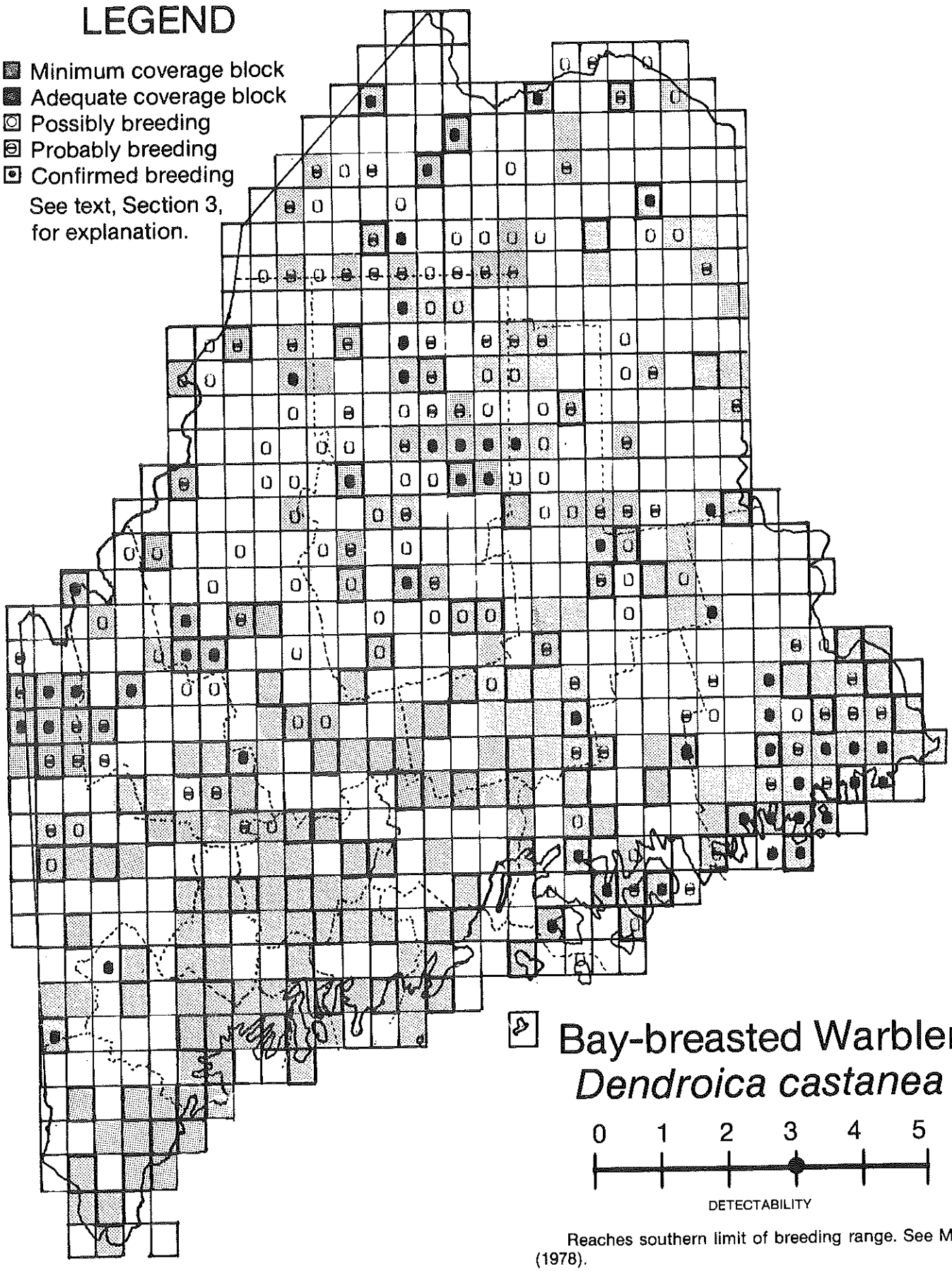
Approaches northeastern limit of breeding range. Restricted to pine stands.



Reaches northern limit of breeding range. Has apparently expanded range northeastward.

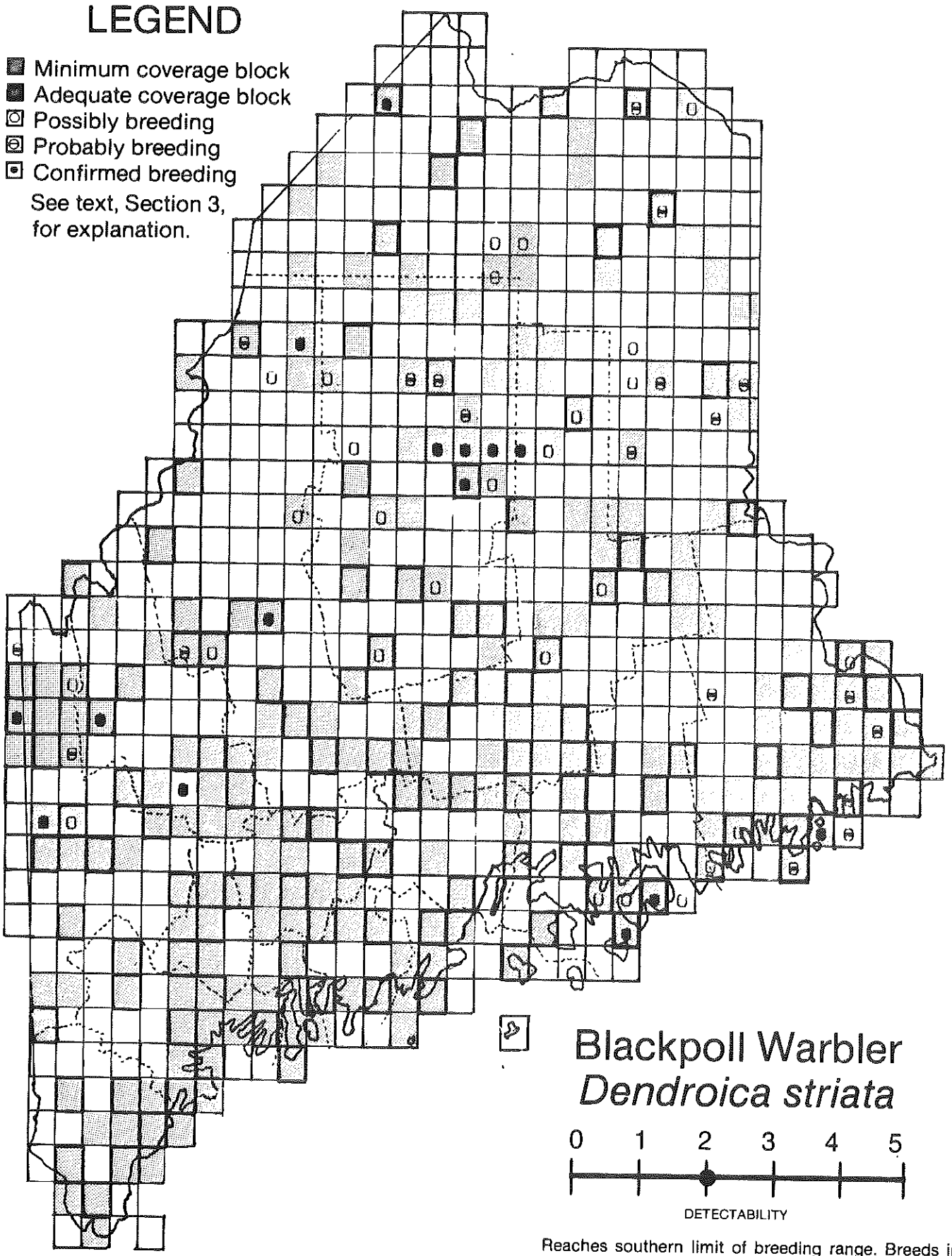


Reaches southern limit of breeding range. Somewhat restricted to peatlands.

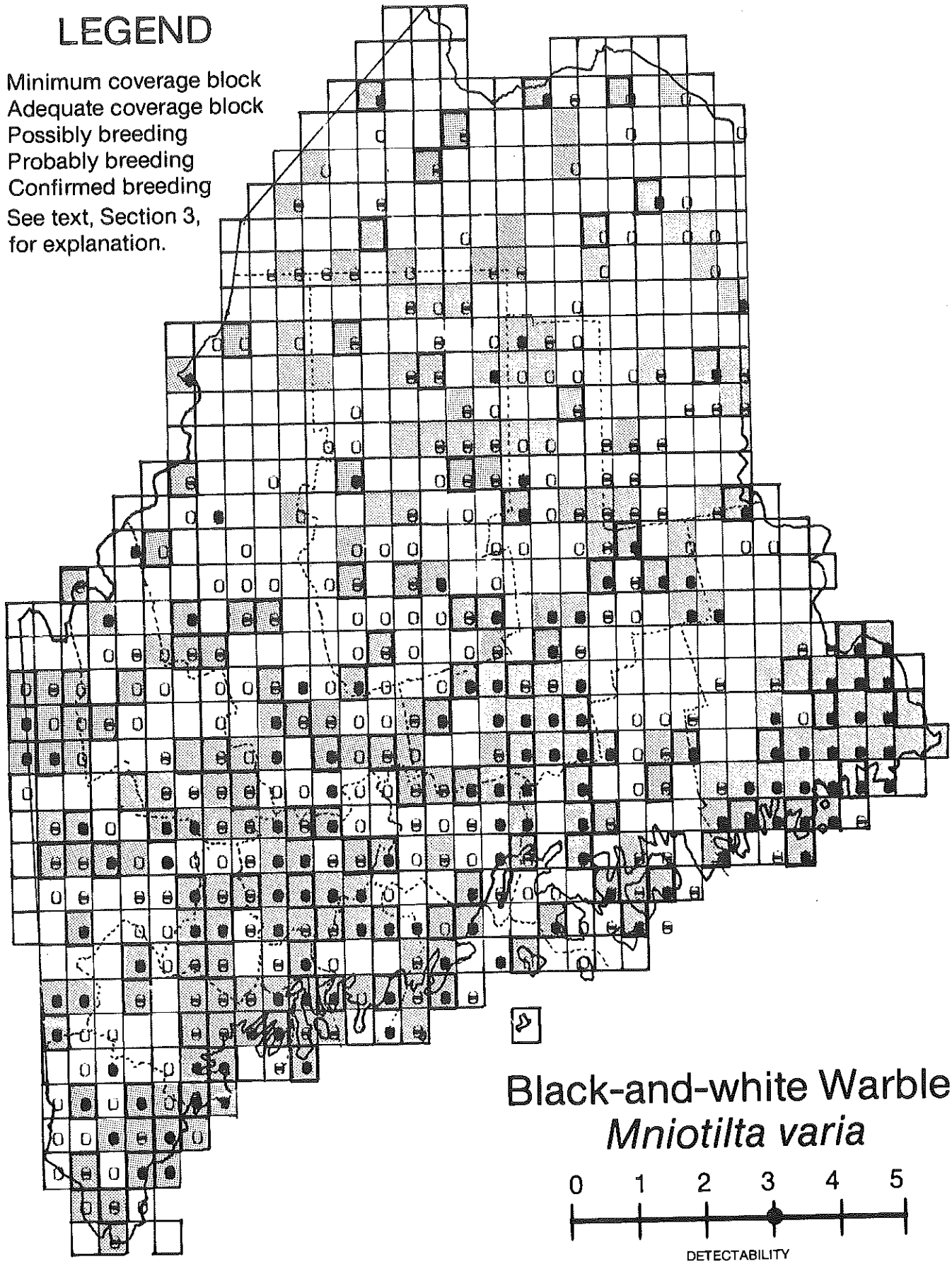


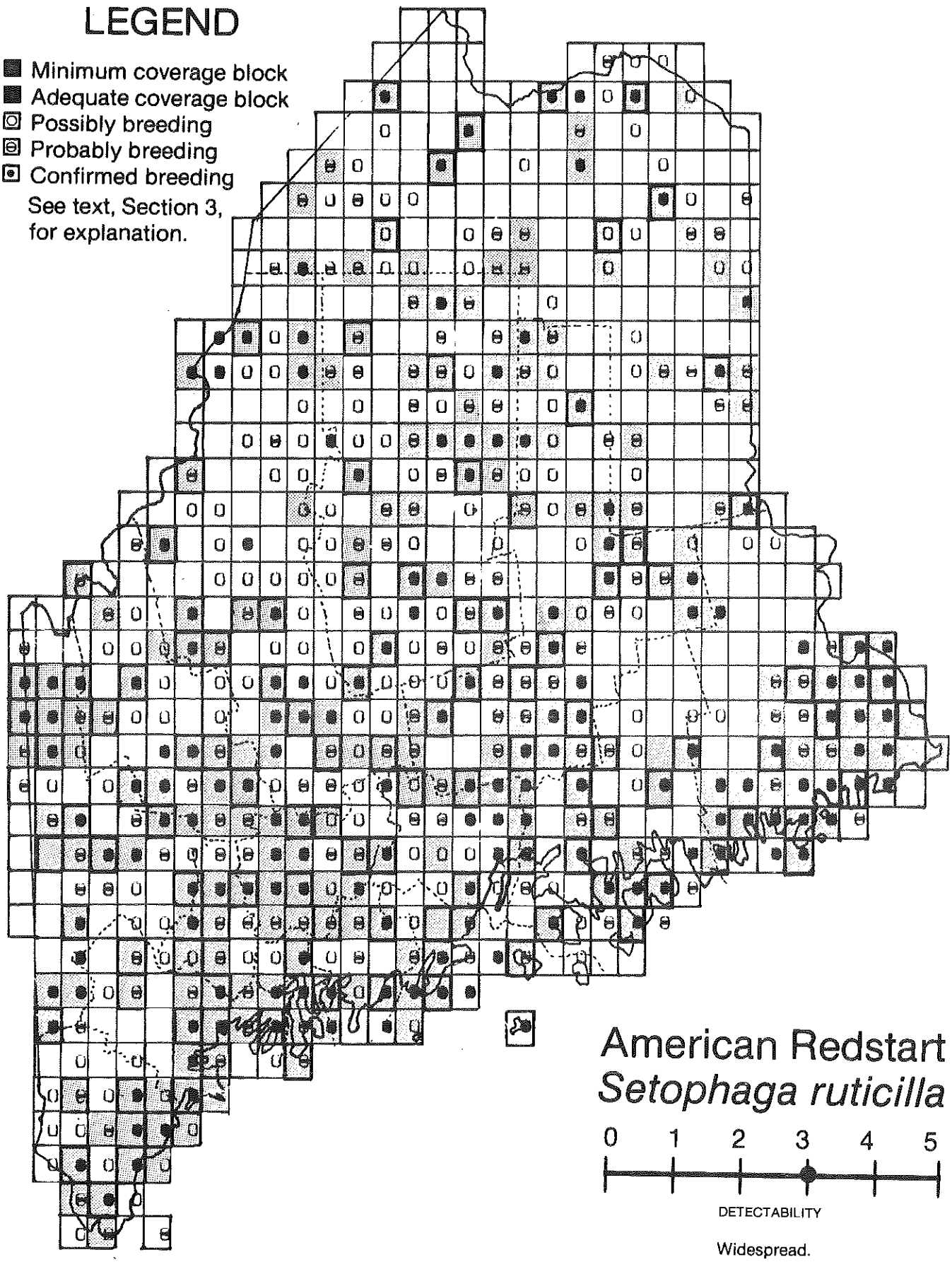
Bay-breasted Warbler
Dendroica castanea

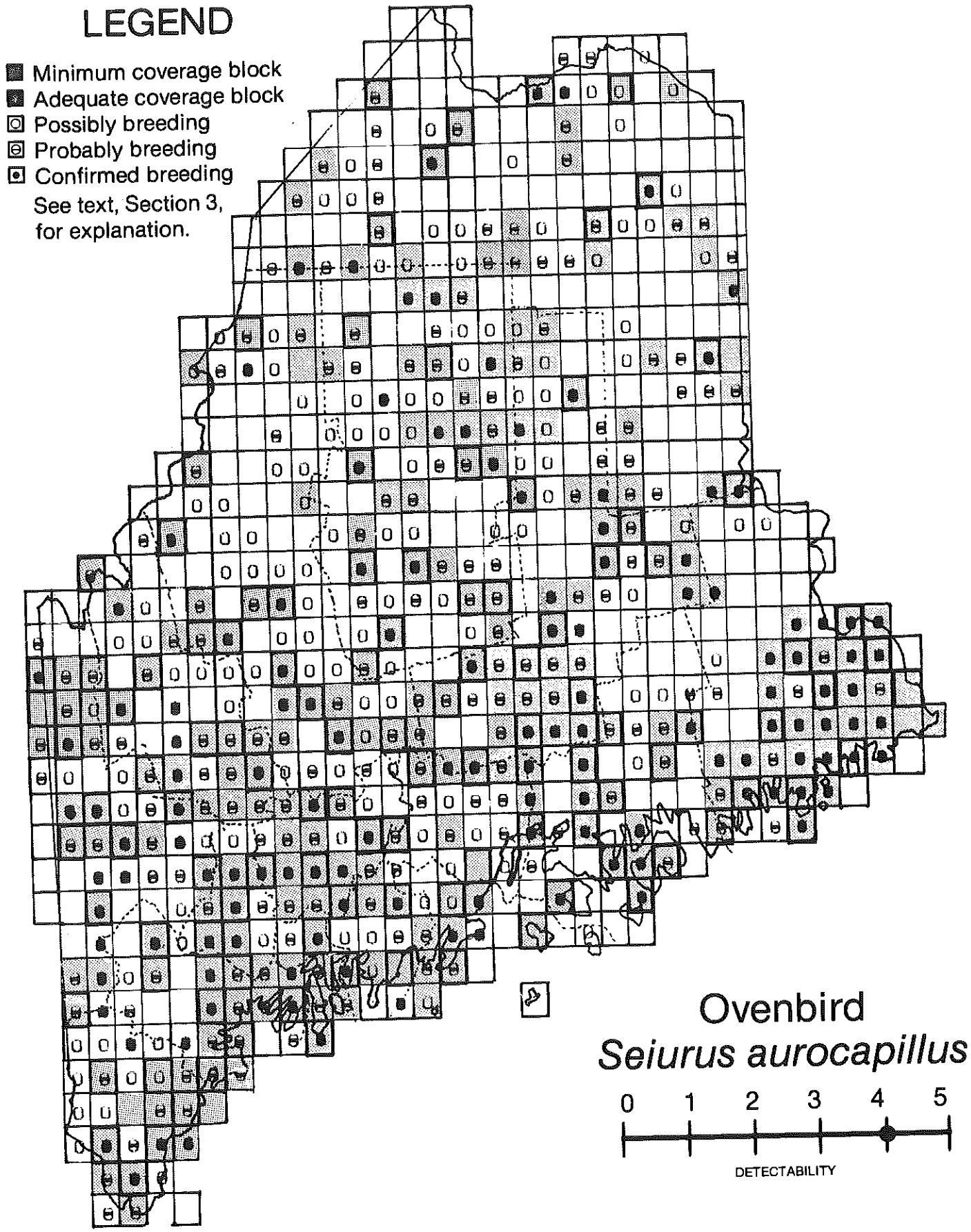
Reaches southern limit of breeding range. See Morse (1978).

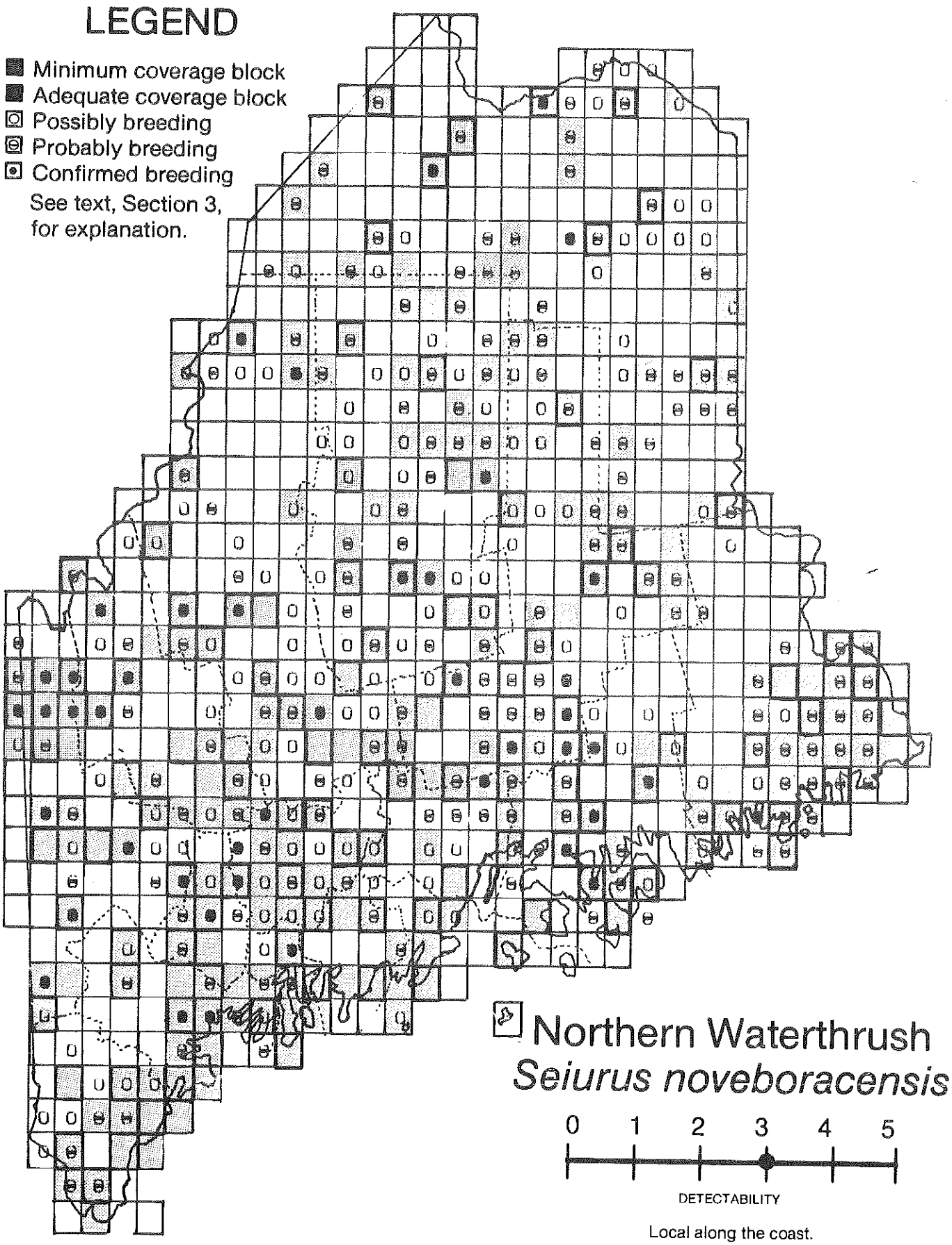


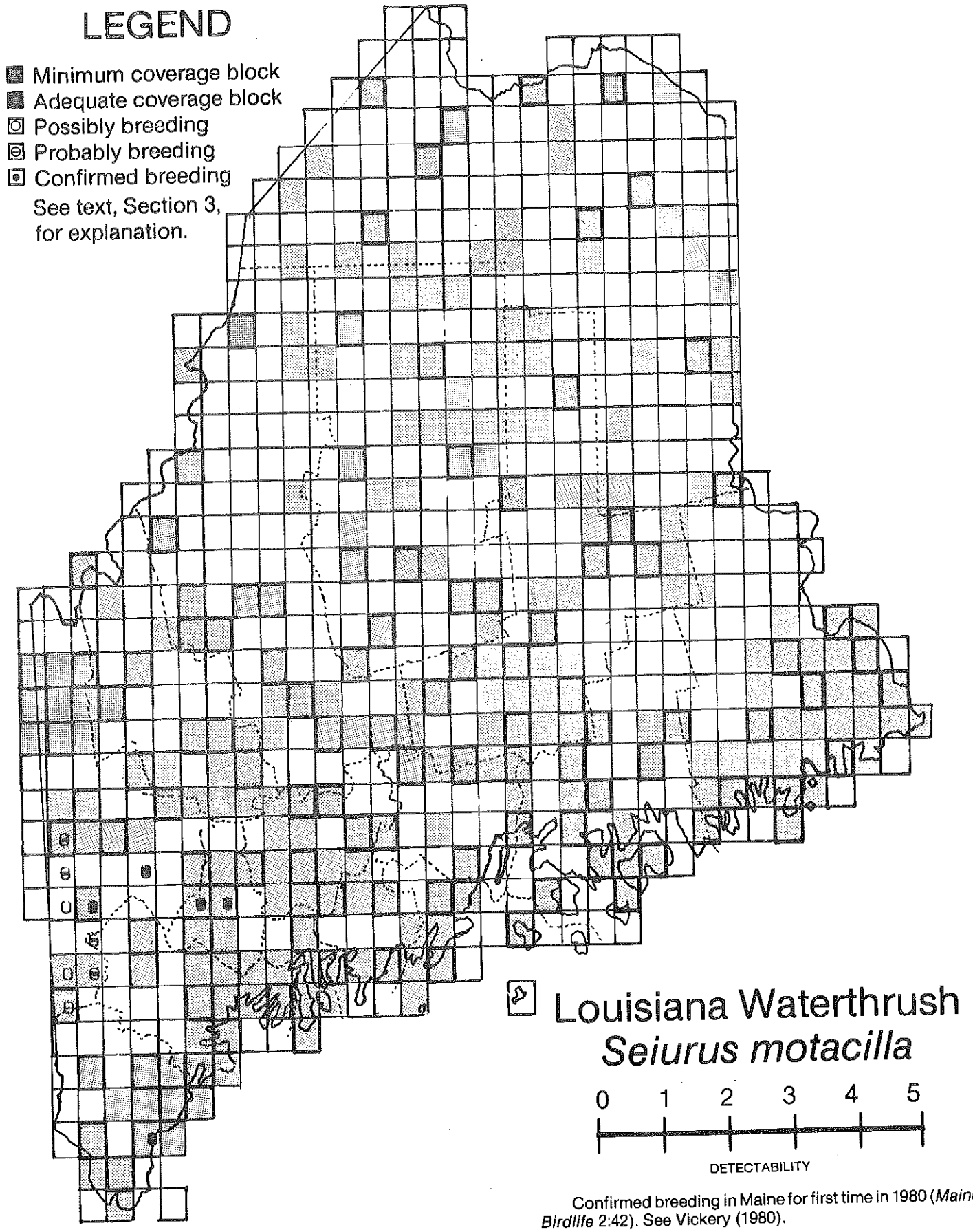
Reaches southern limit of breeding range. Breeds in higher mountains; rather local elsewhere.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Black-and-white Warbler
Mniotilta varia
0 1 2 3 4 5
DETECTABILITY

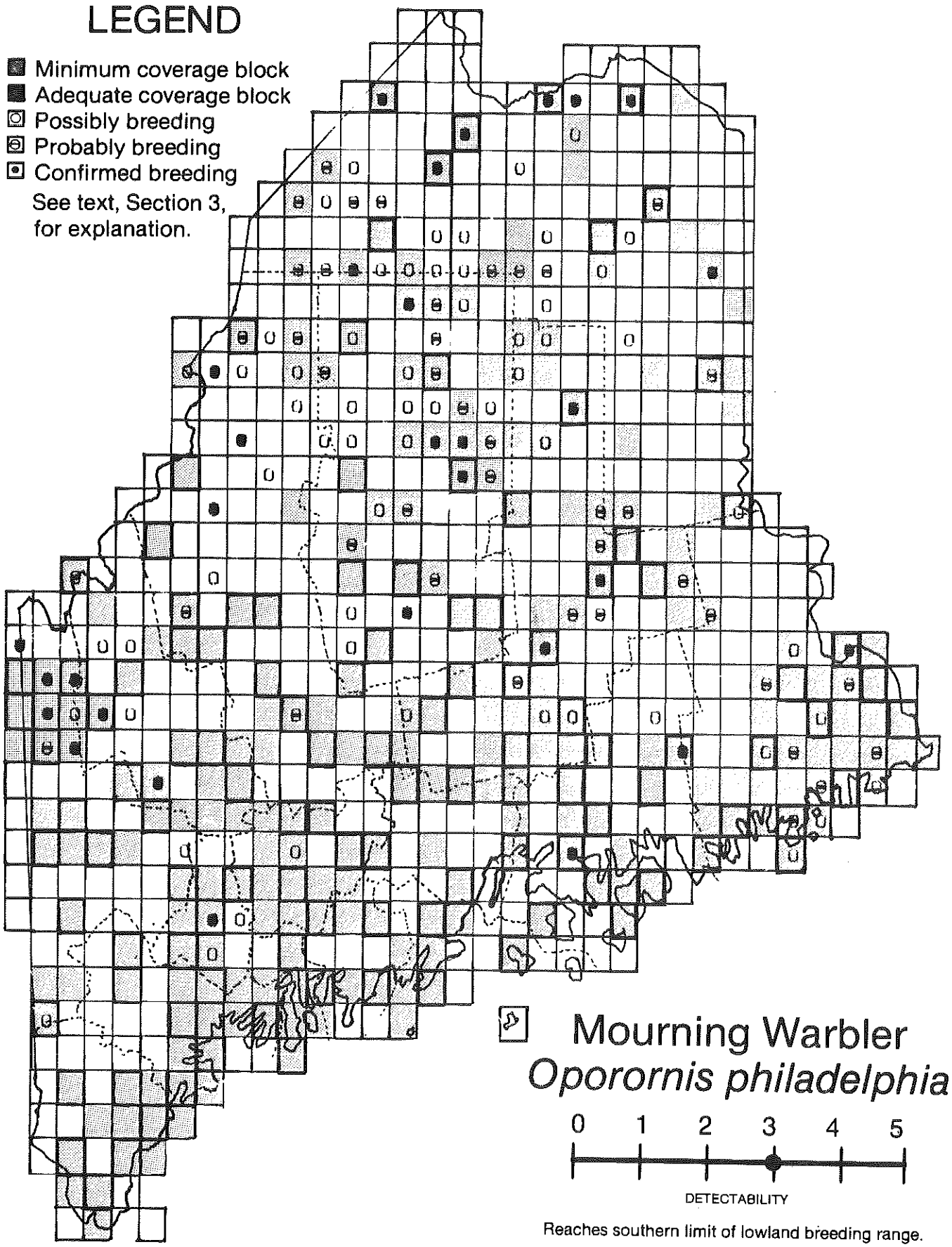

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
American Redstart
Setophaga ruticilla
0 1 2 3 4 5
DETECTABILITY
Widespread.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Ovenbird
Seiurus aurocapillus
0 1 2 3 4 5
DETECTABILITY

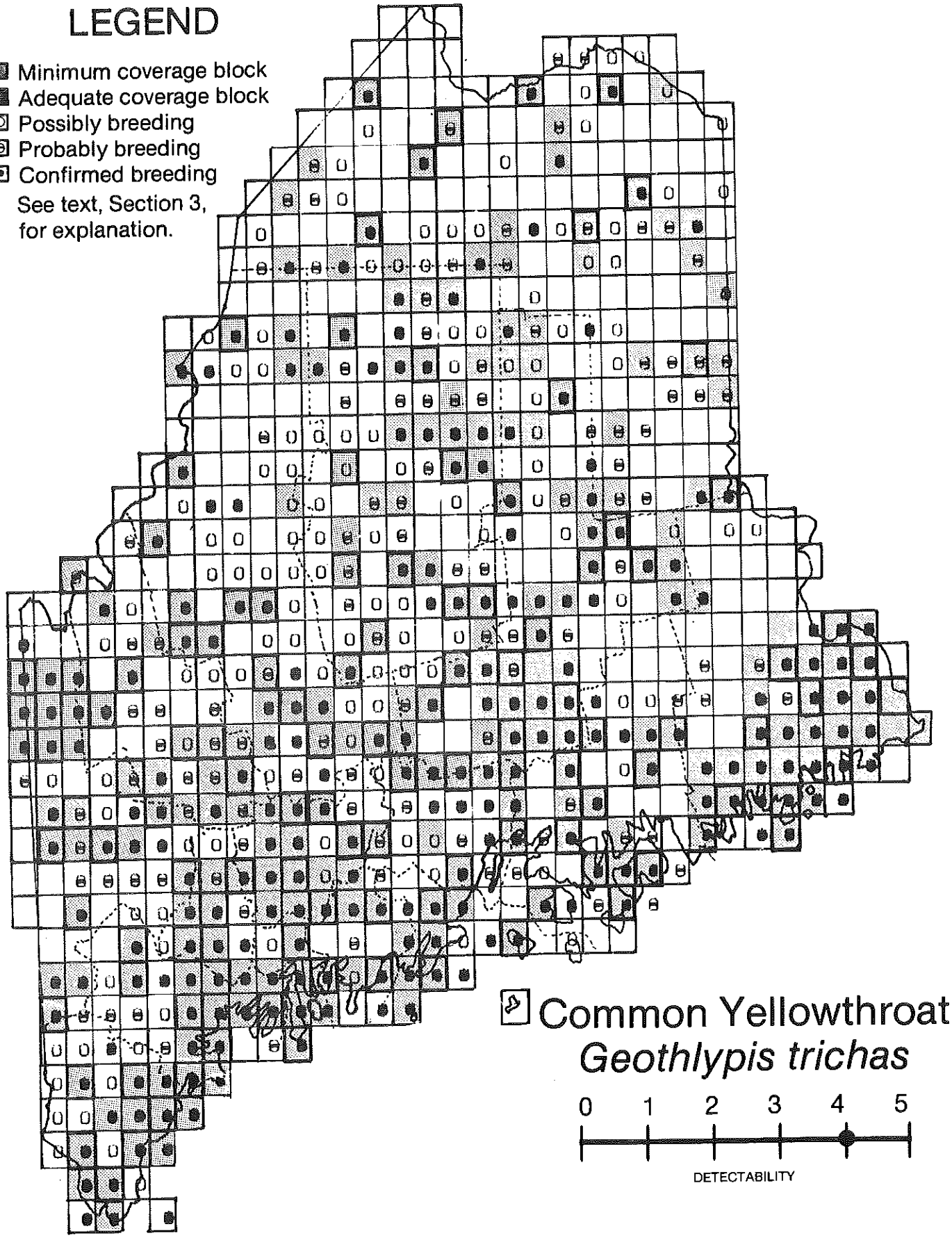

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Northern Waterthrush
Seiurus noveboracensis
0 1 2 3 4 5
DETECTABILITY
Local along the coast.

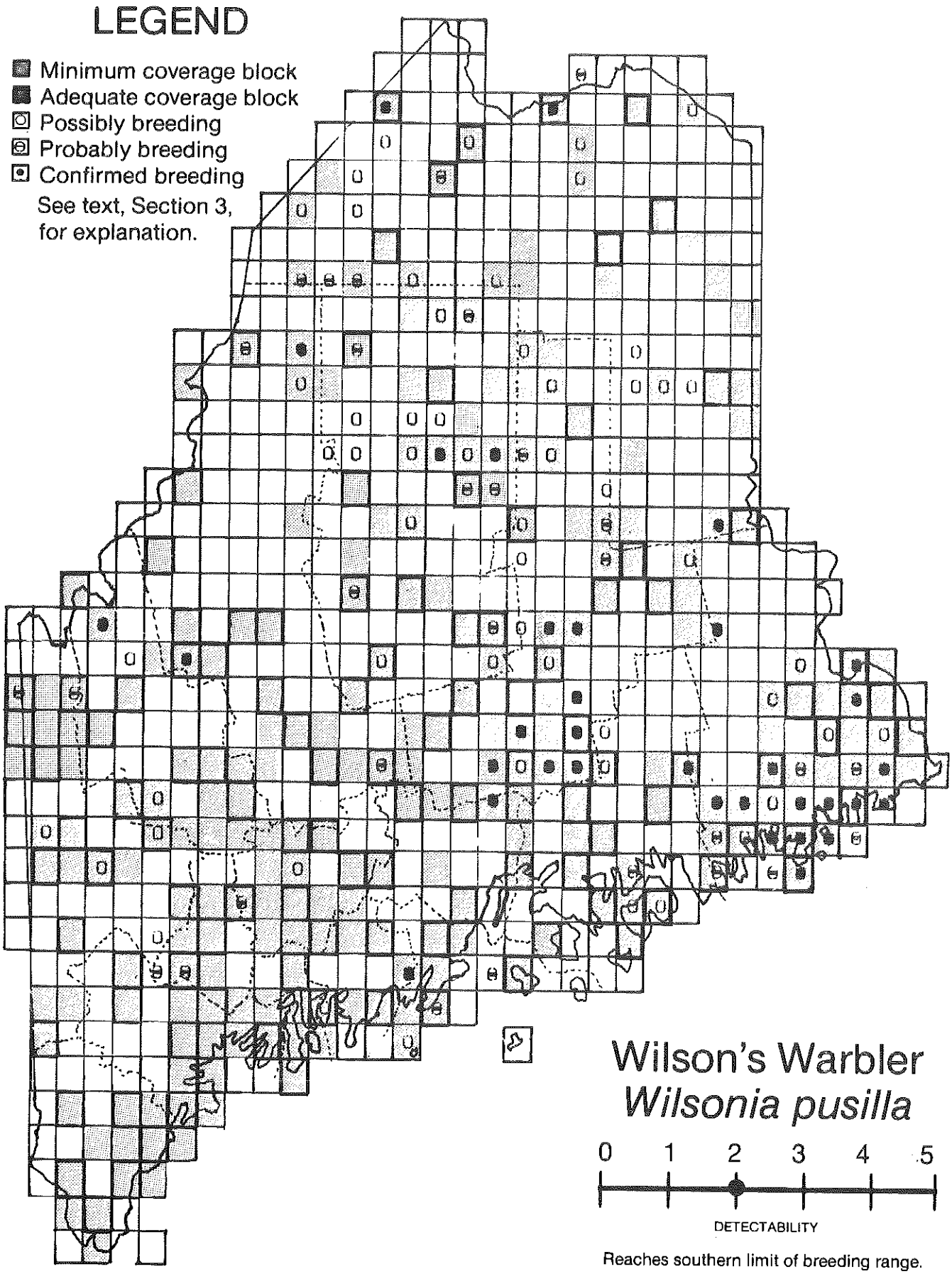


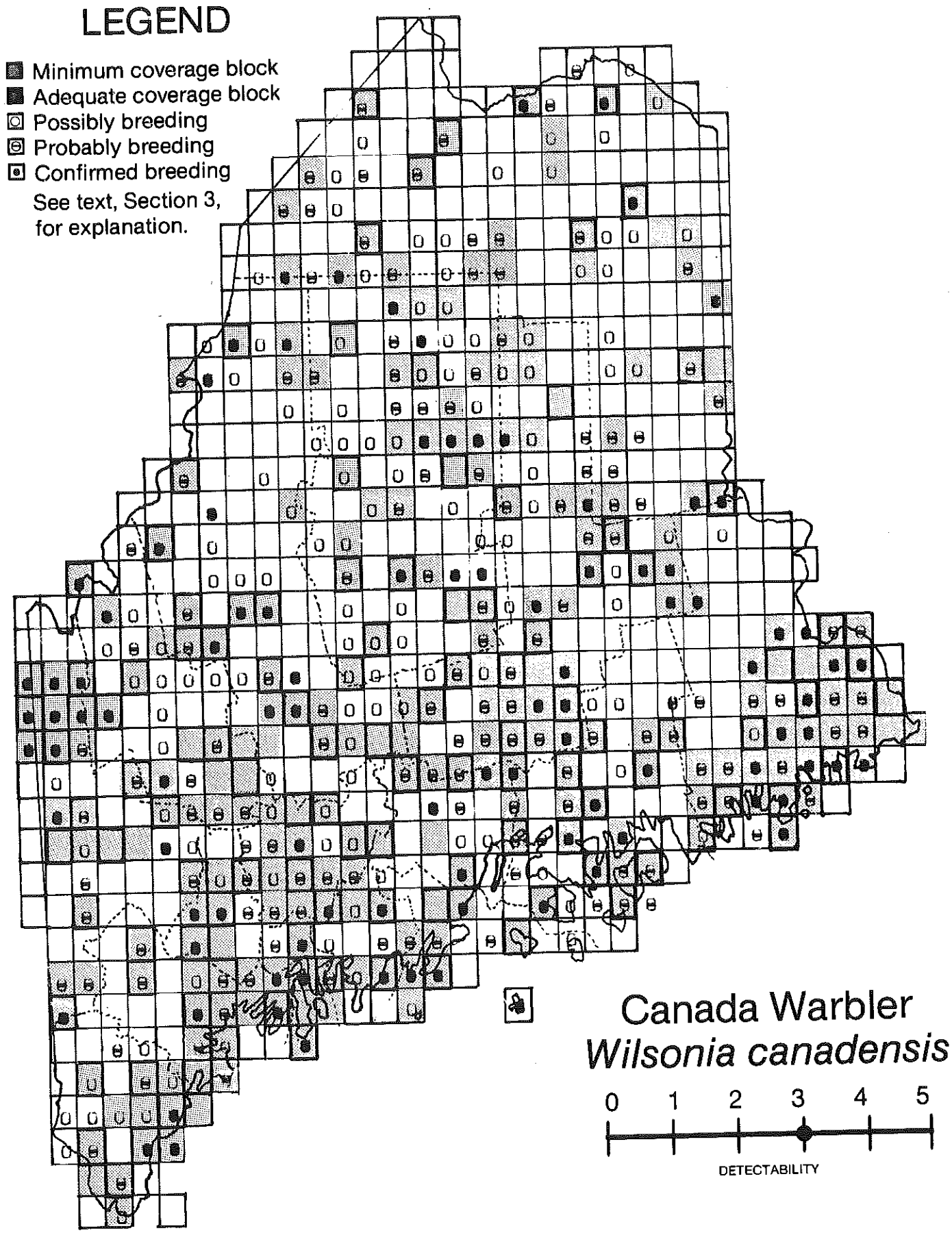
Confirmed breeding in Maine for first time in 1980 (*Maine Birdlife* 2:42). See Vickery (1980).

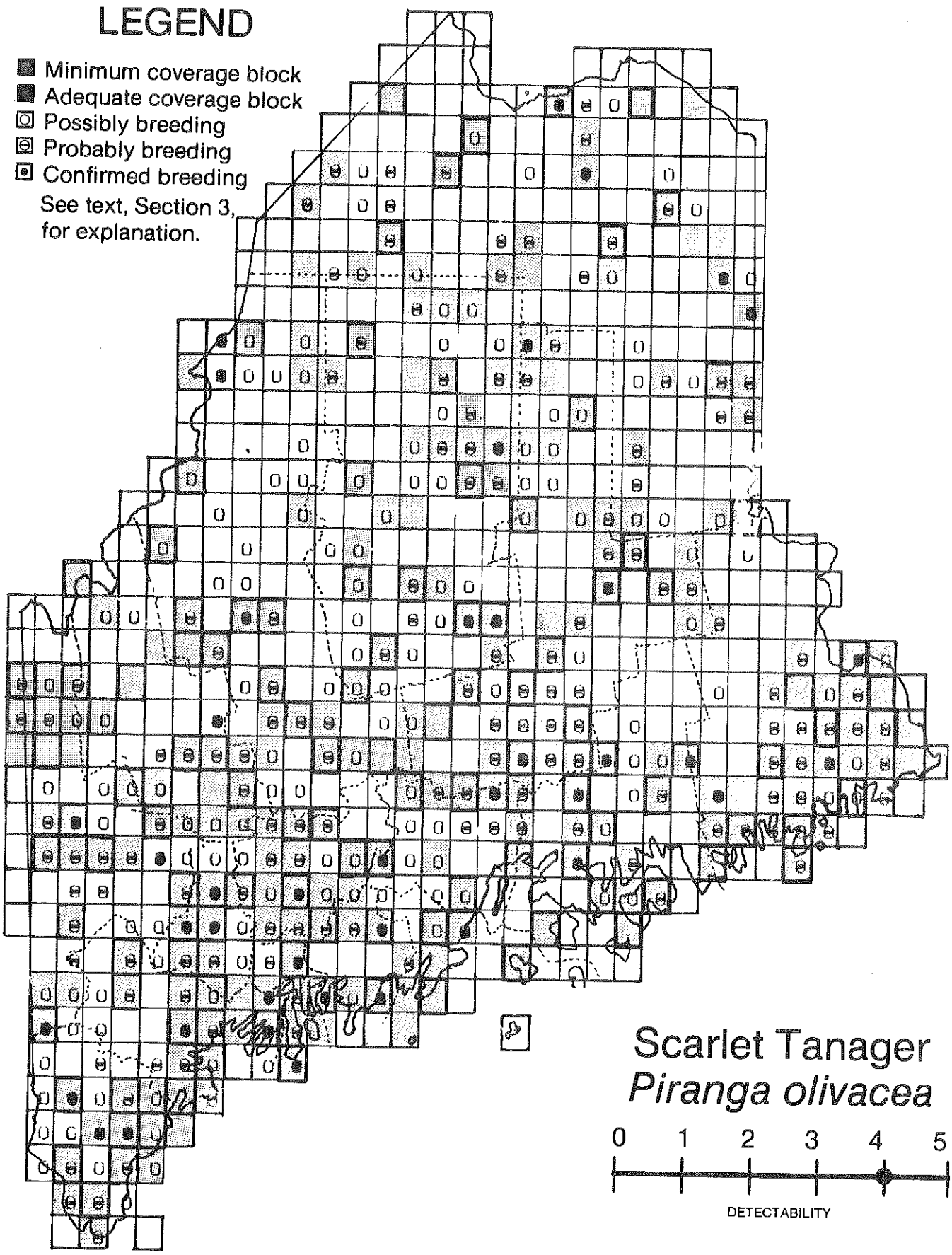


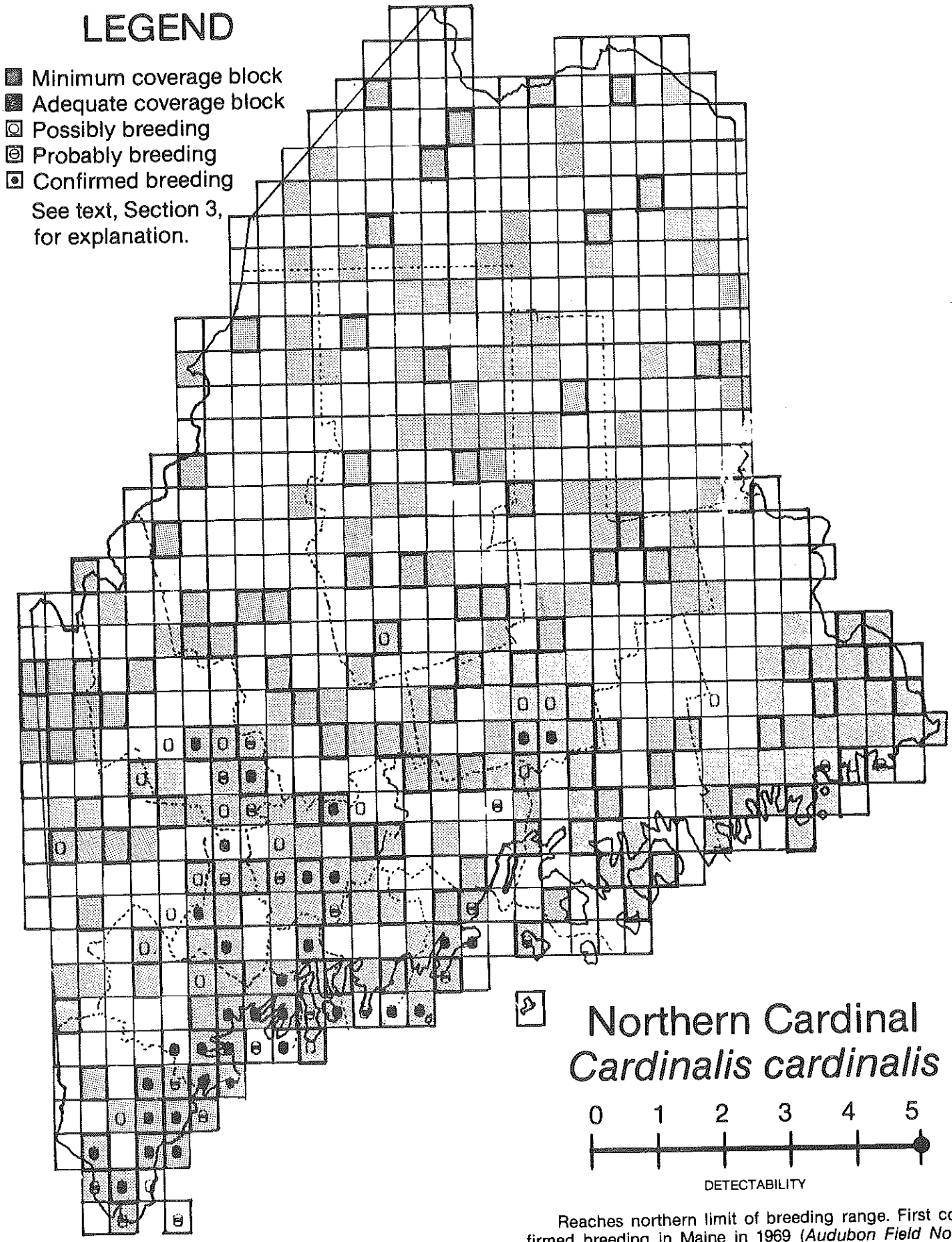
Reaches southern limit of lowland breeding range.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Common Yellowthroat
Geothlypis trichas
0 1 2 3 4 5
DETECTABILITY

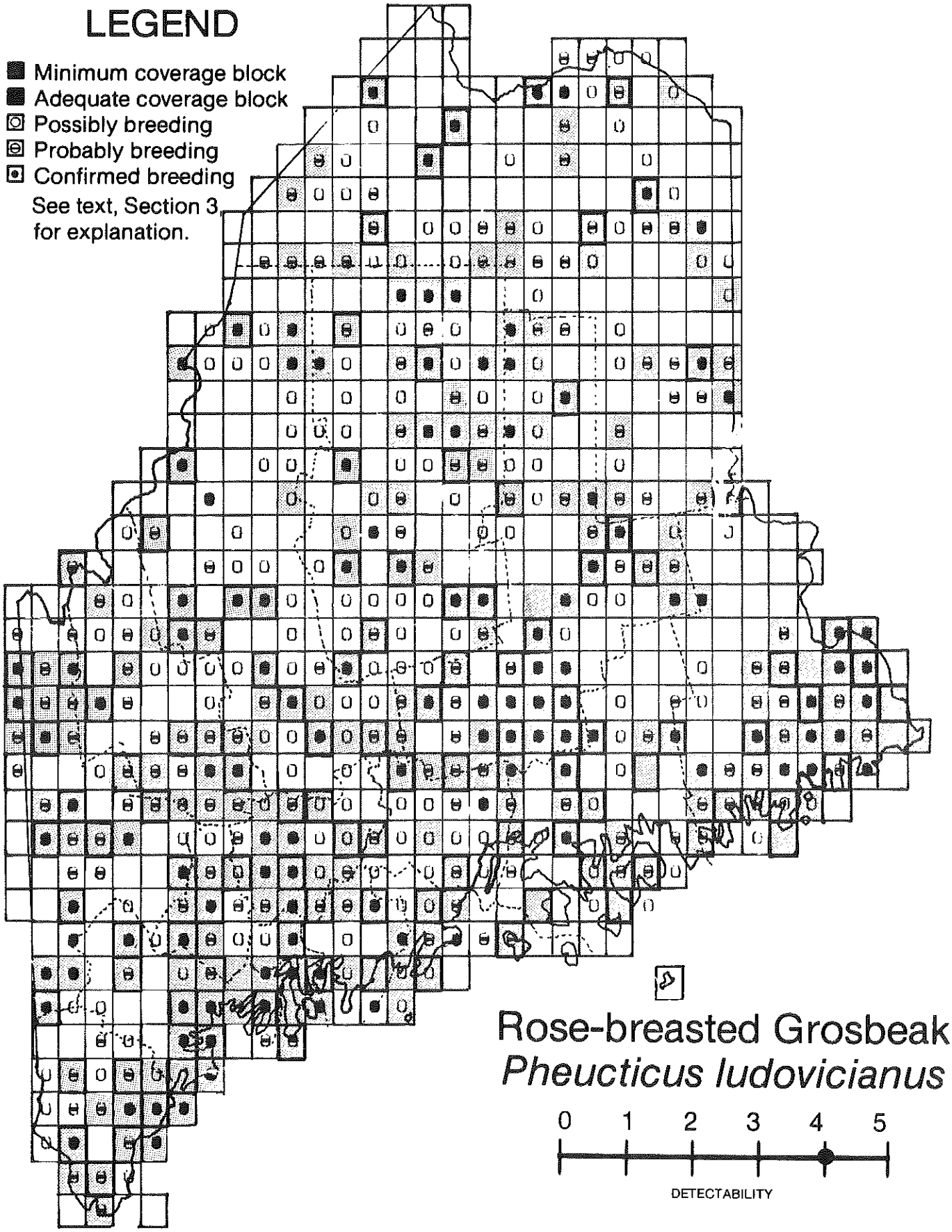

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Wilson's Warbler
Wilsonia pusilla
0 1 2 3 4 5
DETECTABILITY
Reaches southern limit of breeding range.

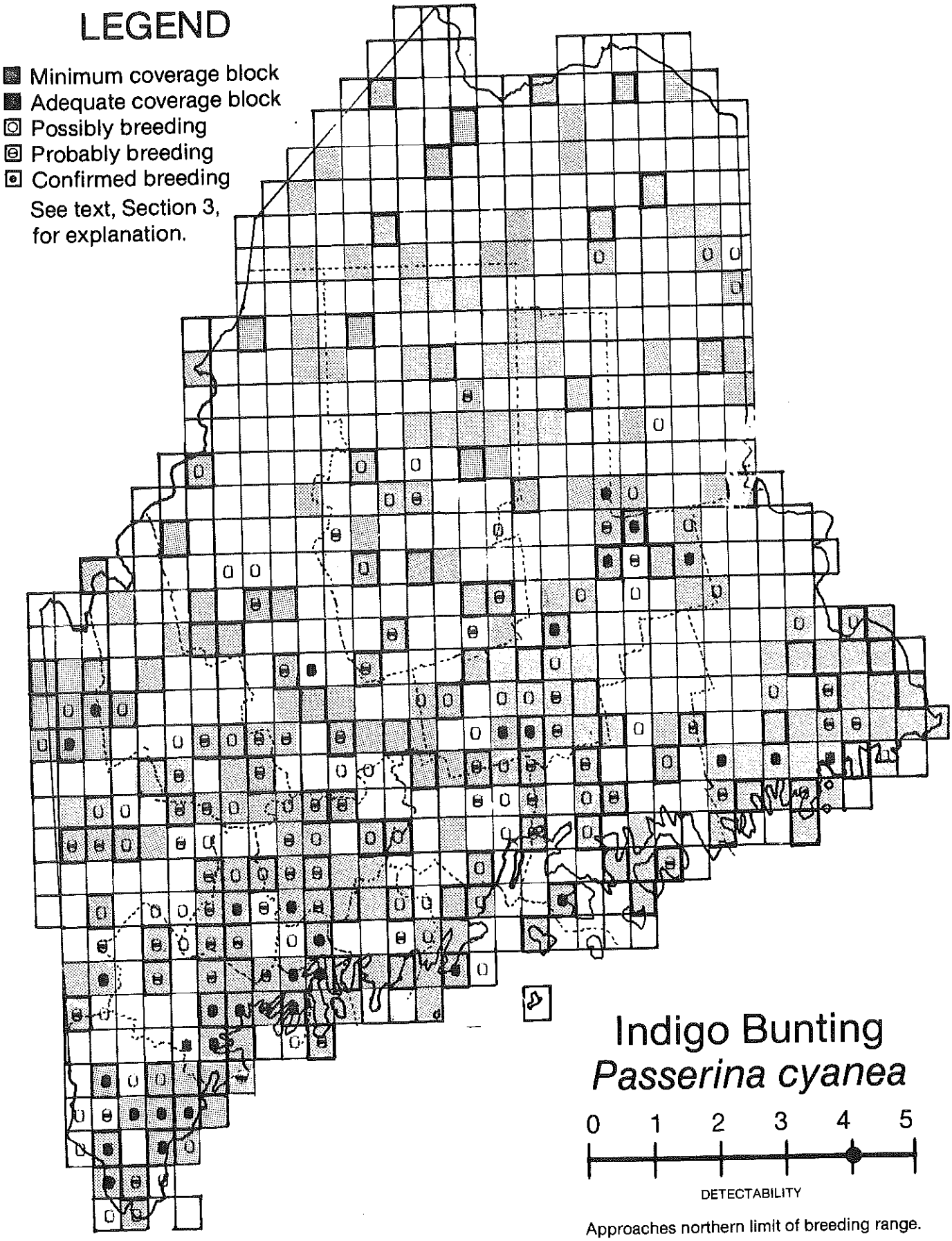

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Canada Warbler
Wilsonia canadensis
0 1 2 3 4 5
DETECTABILITY


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Scarlet Tanager
Piranga olivacea
0 1 2 3 4 5
DETECTABILITY

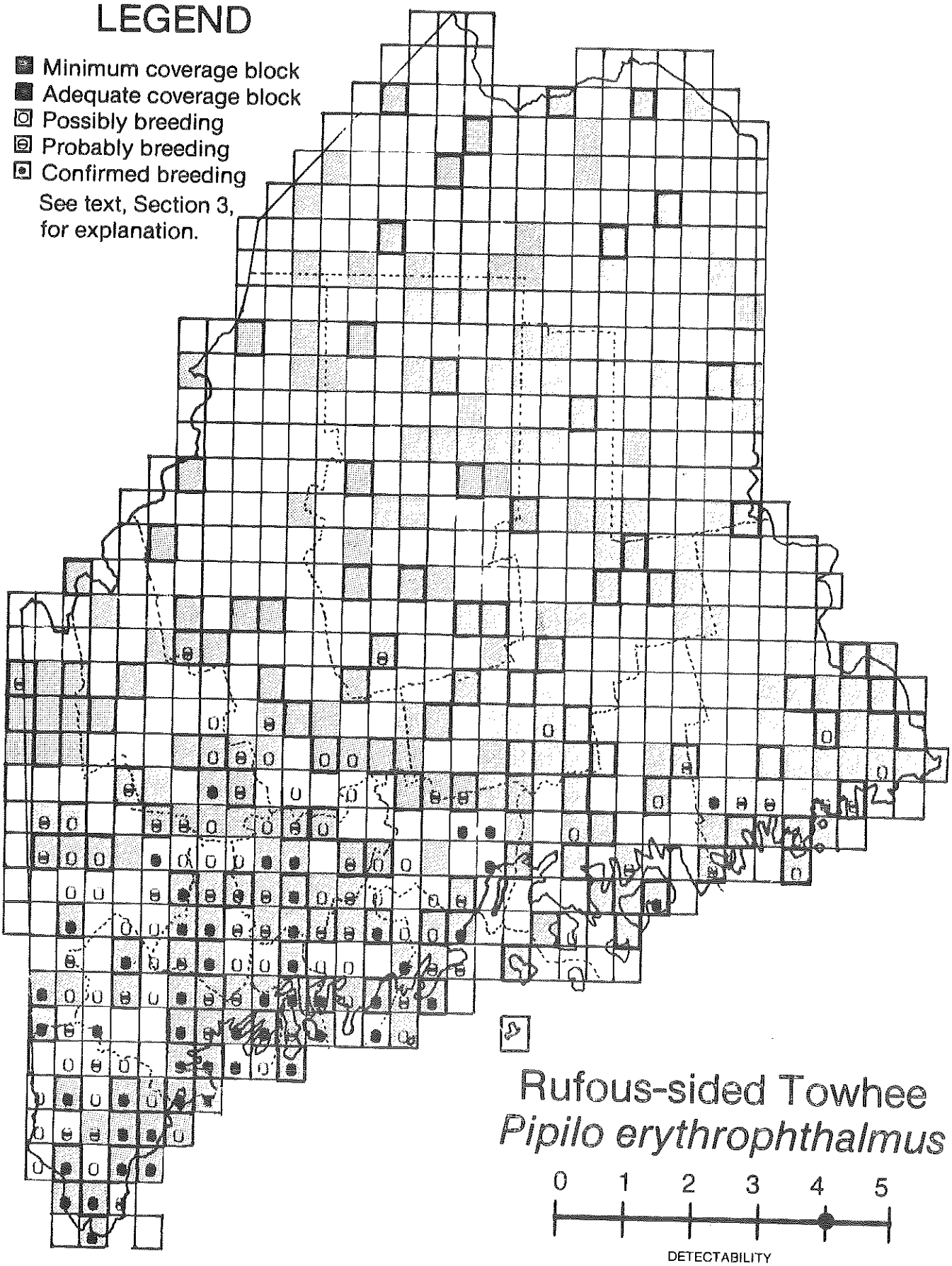


Reaches northern limit of breeding range. First confirmed breeding in Maine in 1969 (*Audubon Field Notes* 23:642). Increasing . Mostly restricted to developed regions.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Rose-breasted Grosbeak
Pheucticus ludovicianus
0 1 2 3 4 5
DETECTABILITY



Approaches northern limit of breeding range.

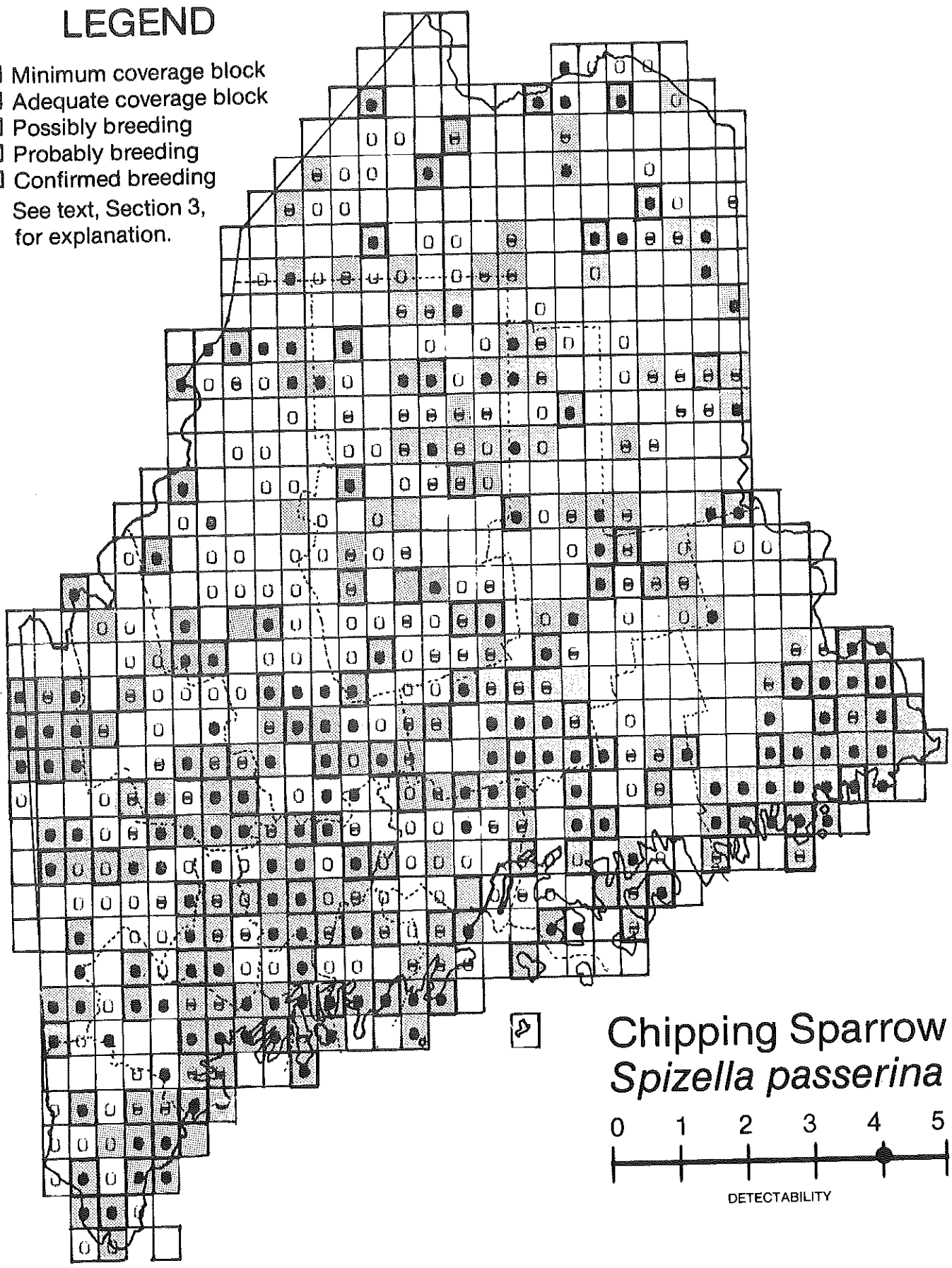


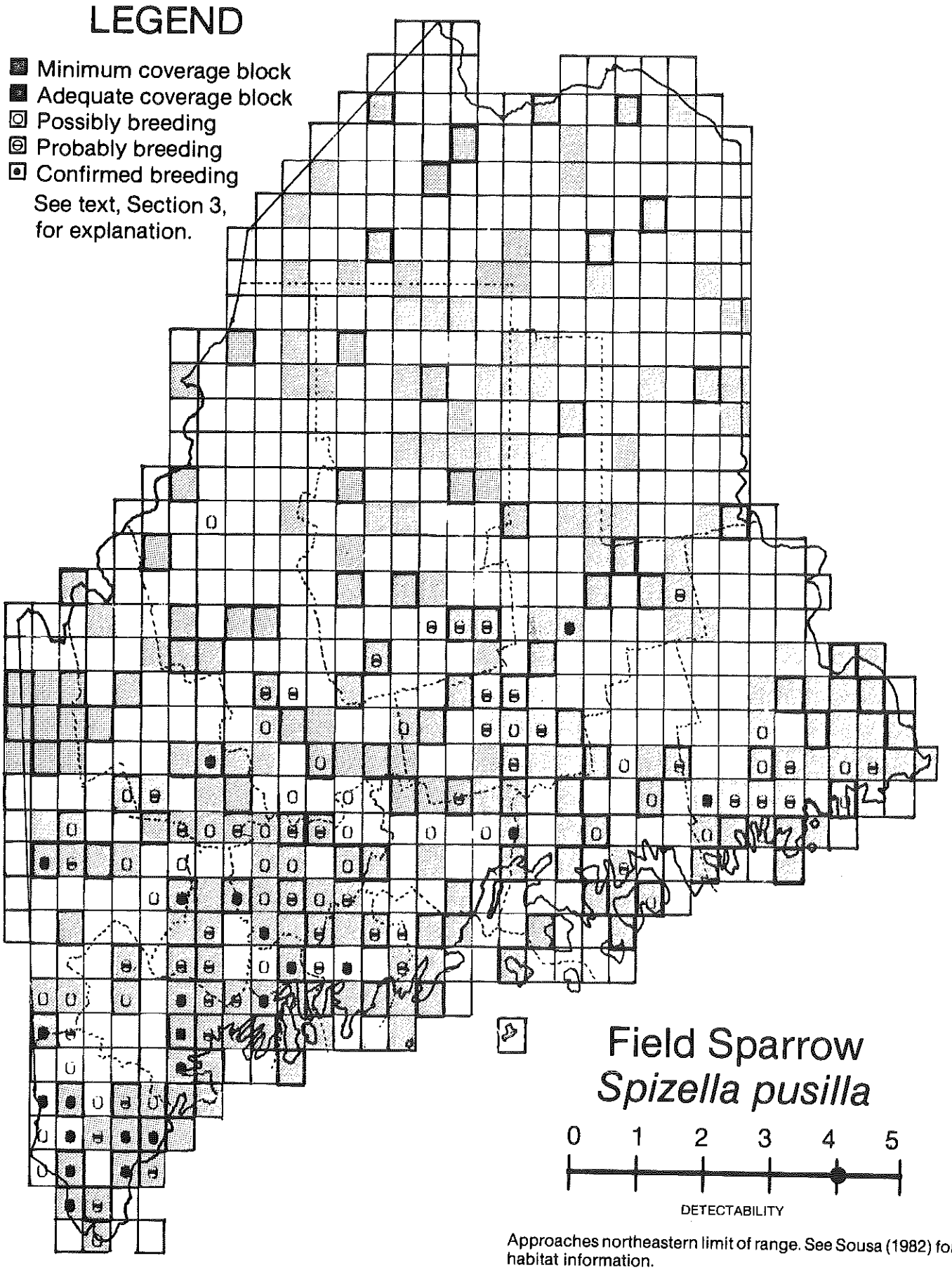
Rufous-sided Towhee
Pipilo erythrophthalmus

0 1 2 3 4 5

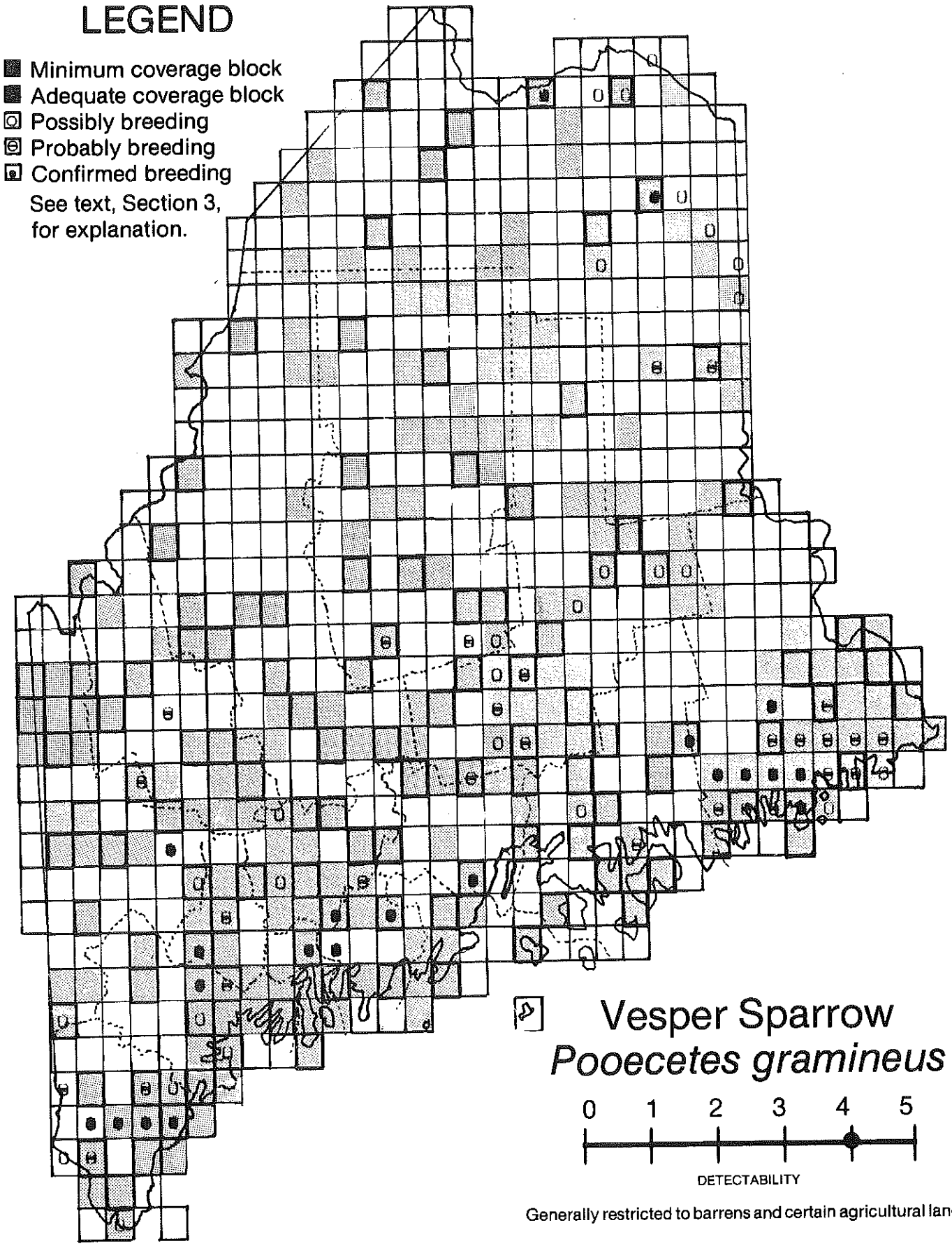
DETECTABILITY

Reaches northern limit of breeding range.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Chipping Sparrow
Spizella passerina
0 1 2 3 4 5
DETECTABILITY



Approaches northeastern limit of range. See Sousa (1982) for habitat information.

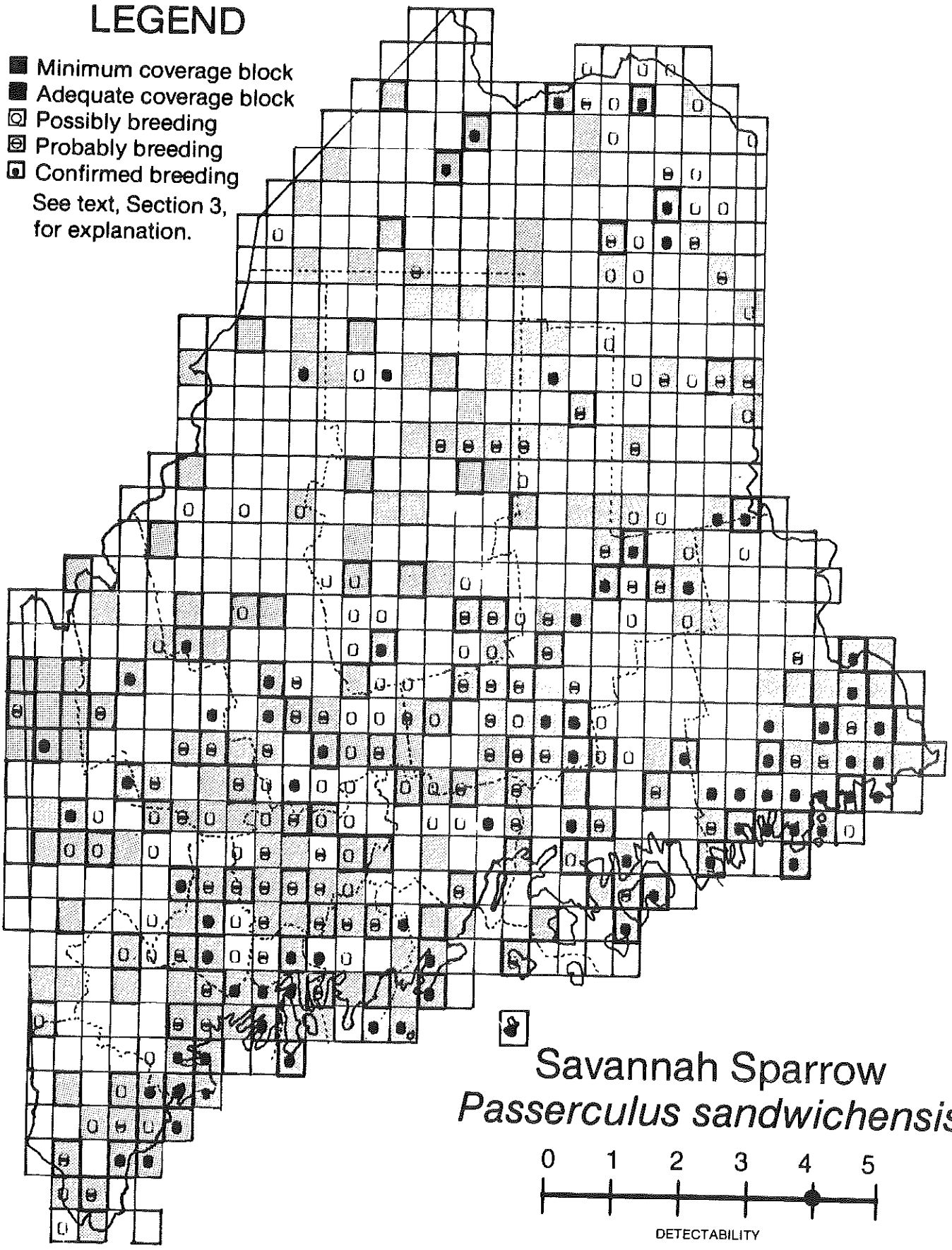


Vesper Sparrow
Pooecetes gramineus

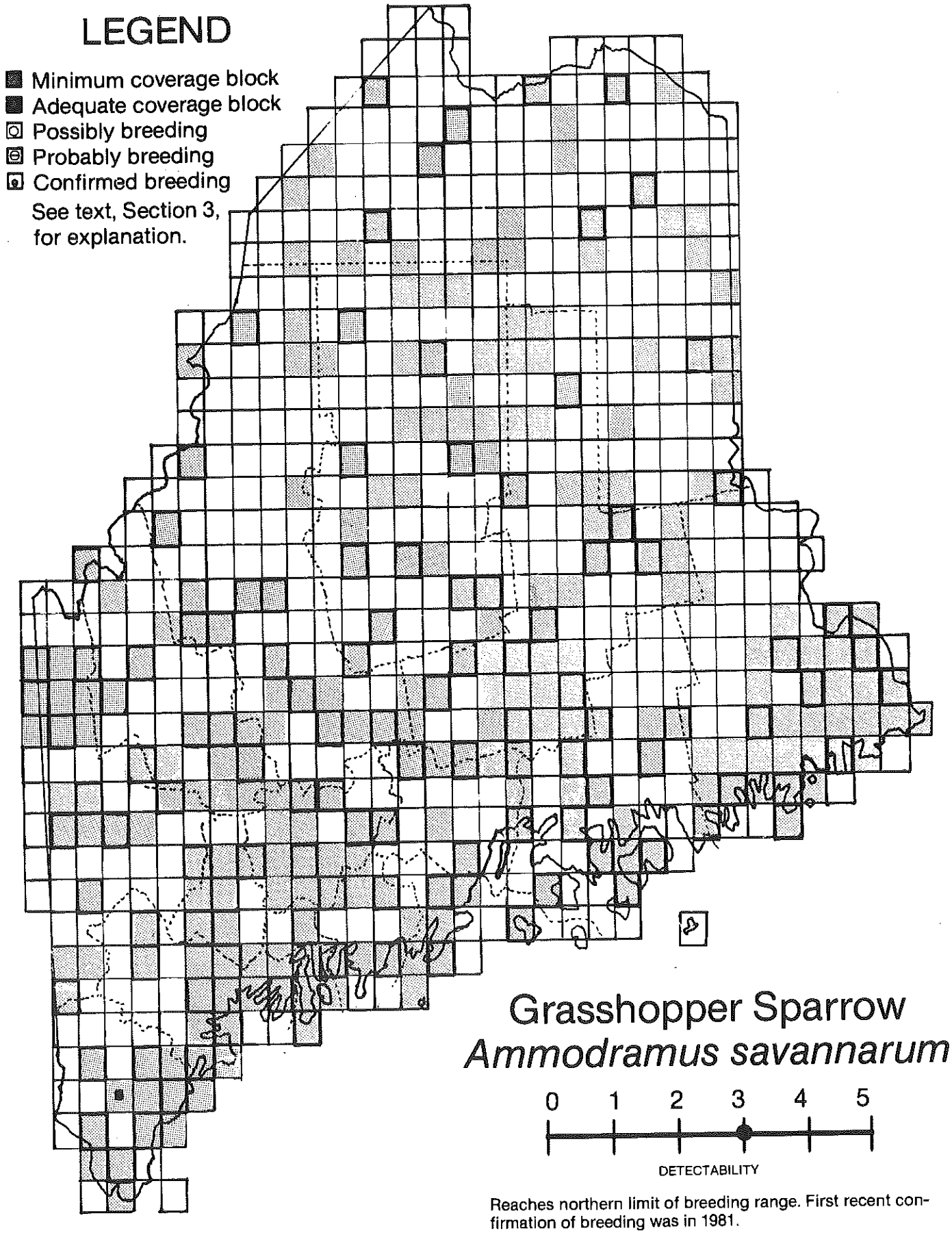
0 1 2 3 4 5

DETECTABILITY

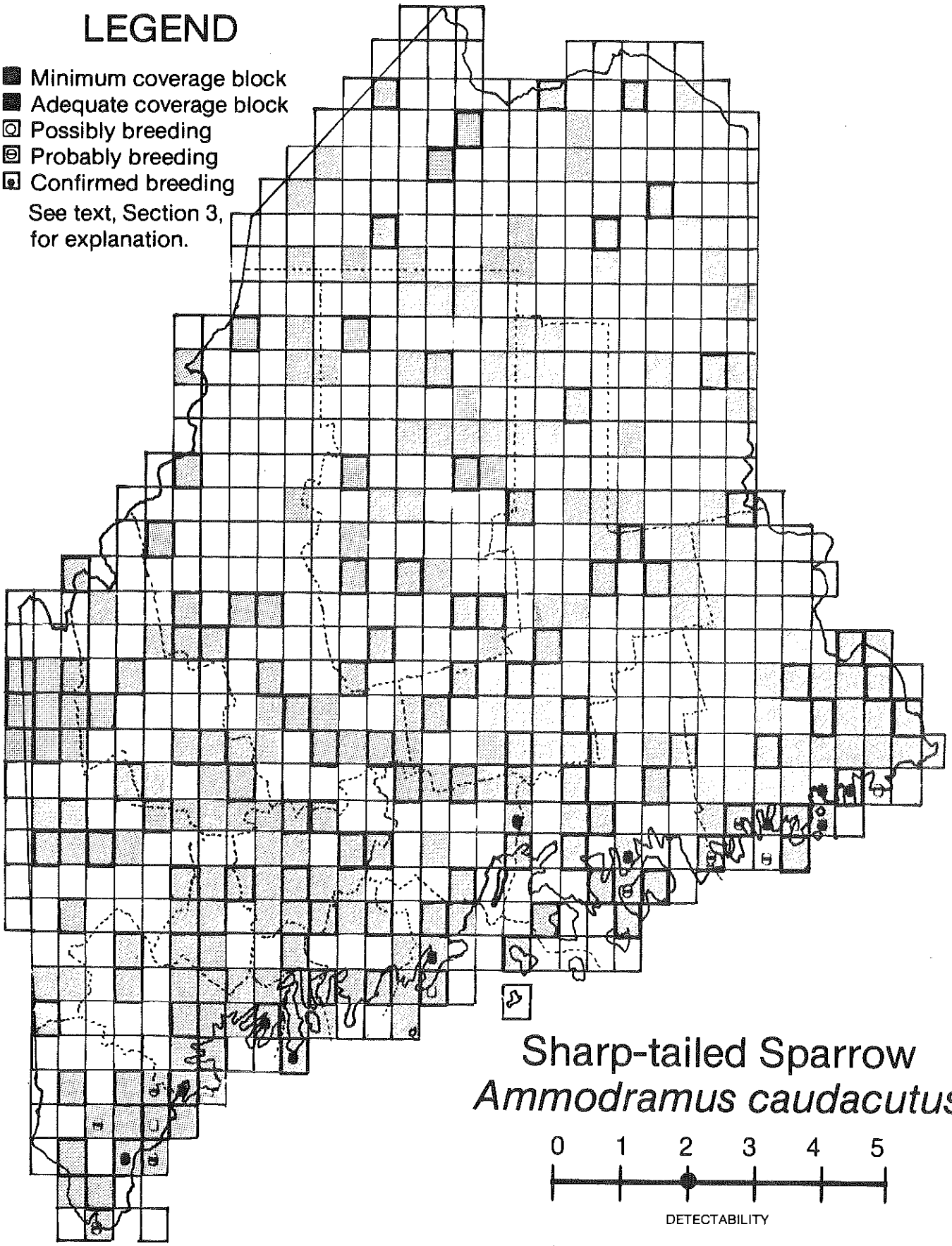
Generally restricted to barrens and certain agricultural lands.



Mostly confined to open land regions of the state. See Dixon (1978).



Reaches northern limit of breeding range. First recent confirmation of breeding was in 1981.

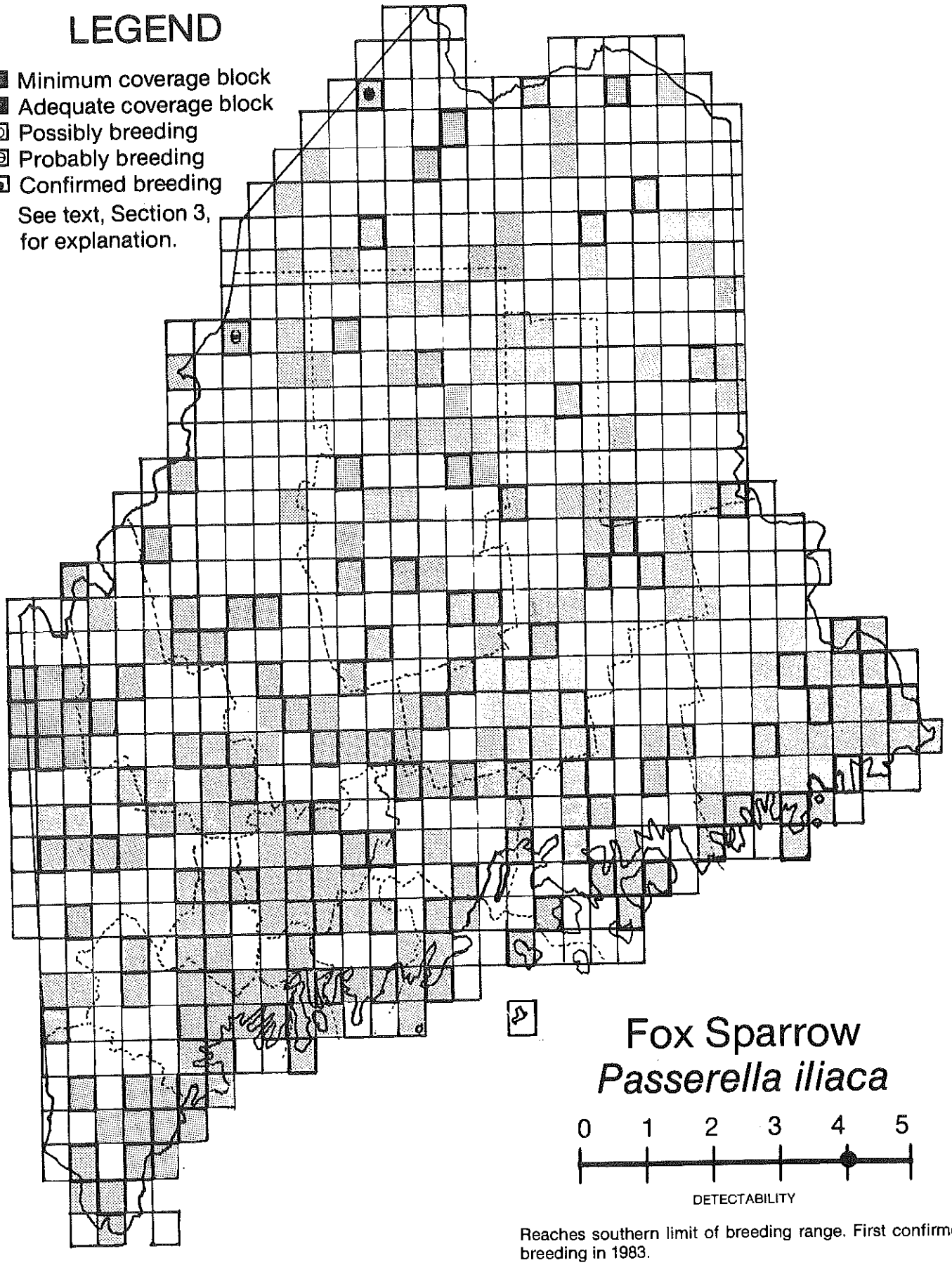


Sharp-tailed Sparrow
Ammodramus caudacutus

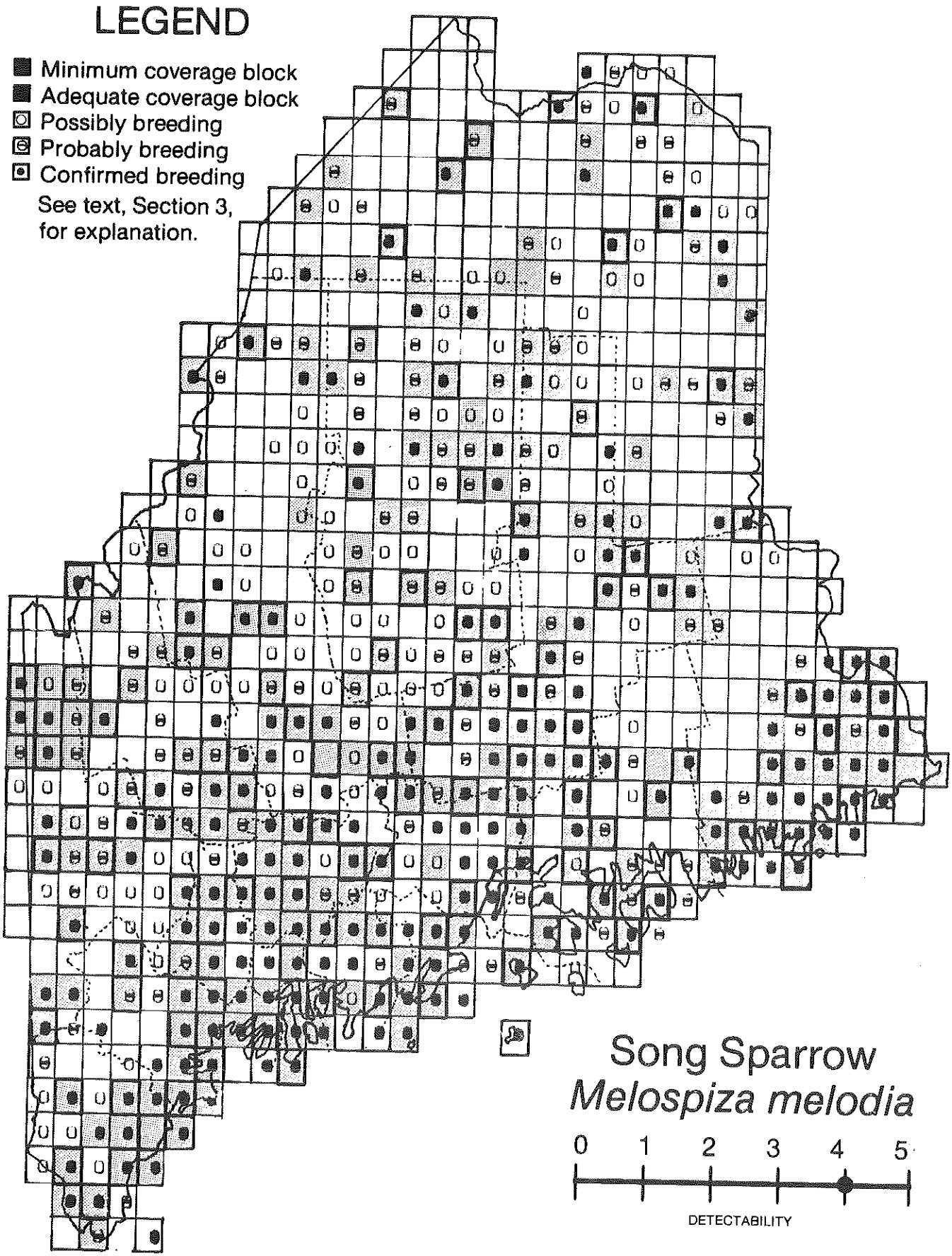
0 1 2 3 4 5

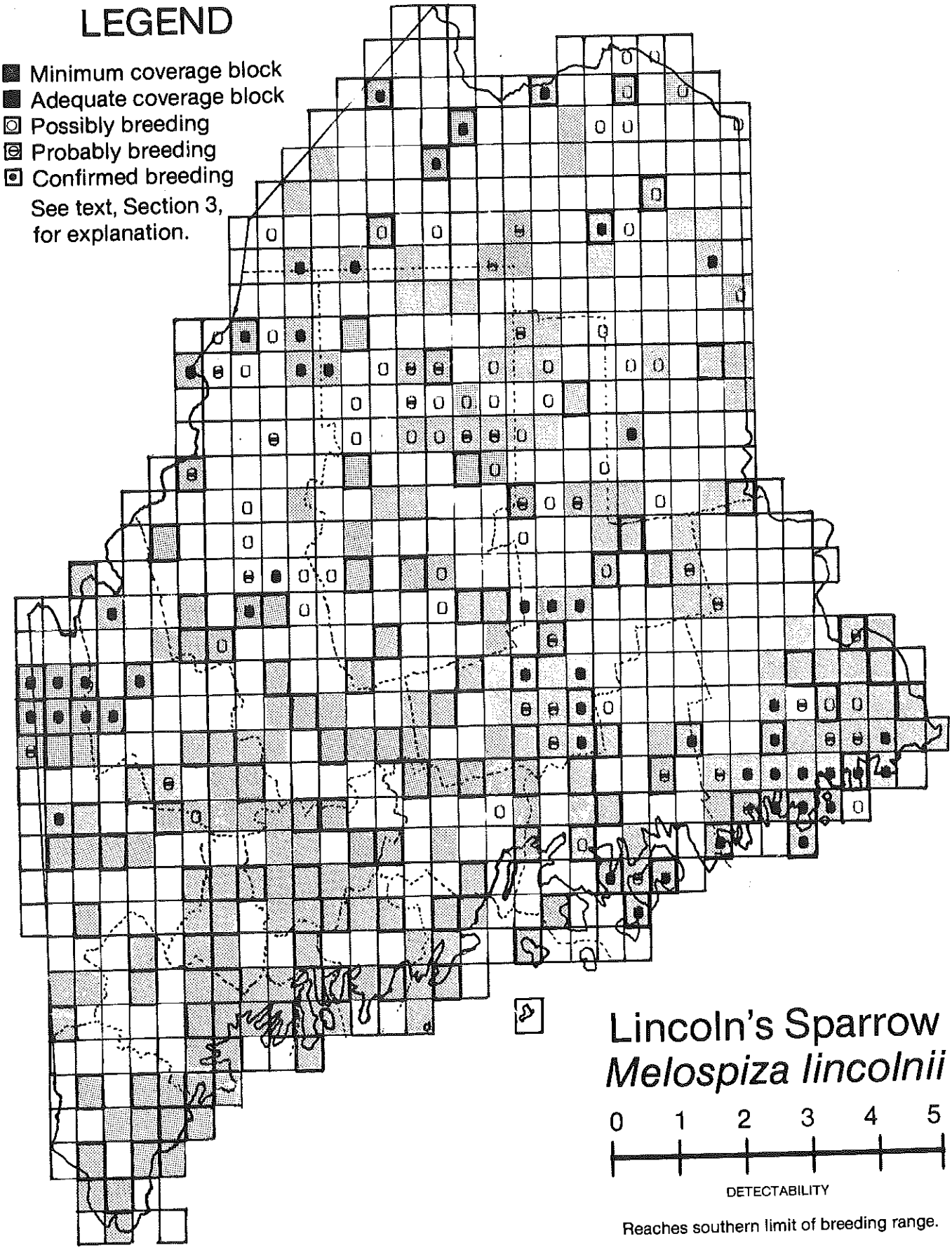
DETECTABILITY

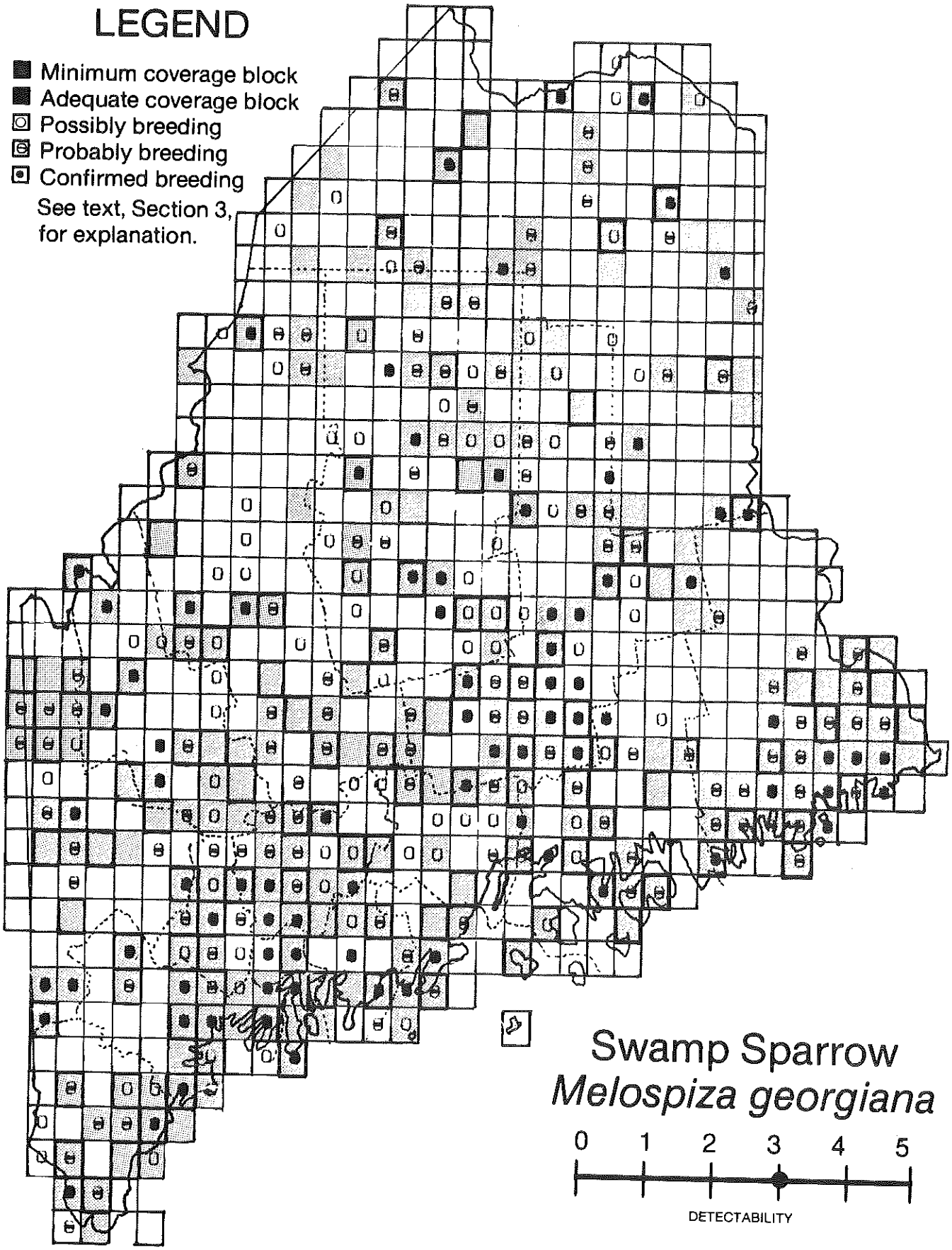
Local breeder, chiefly in coastal salt marshes.

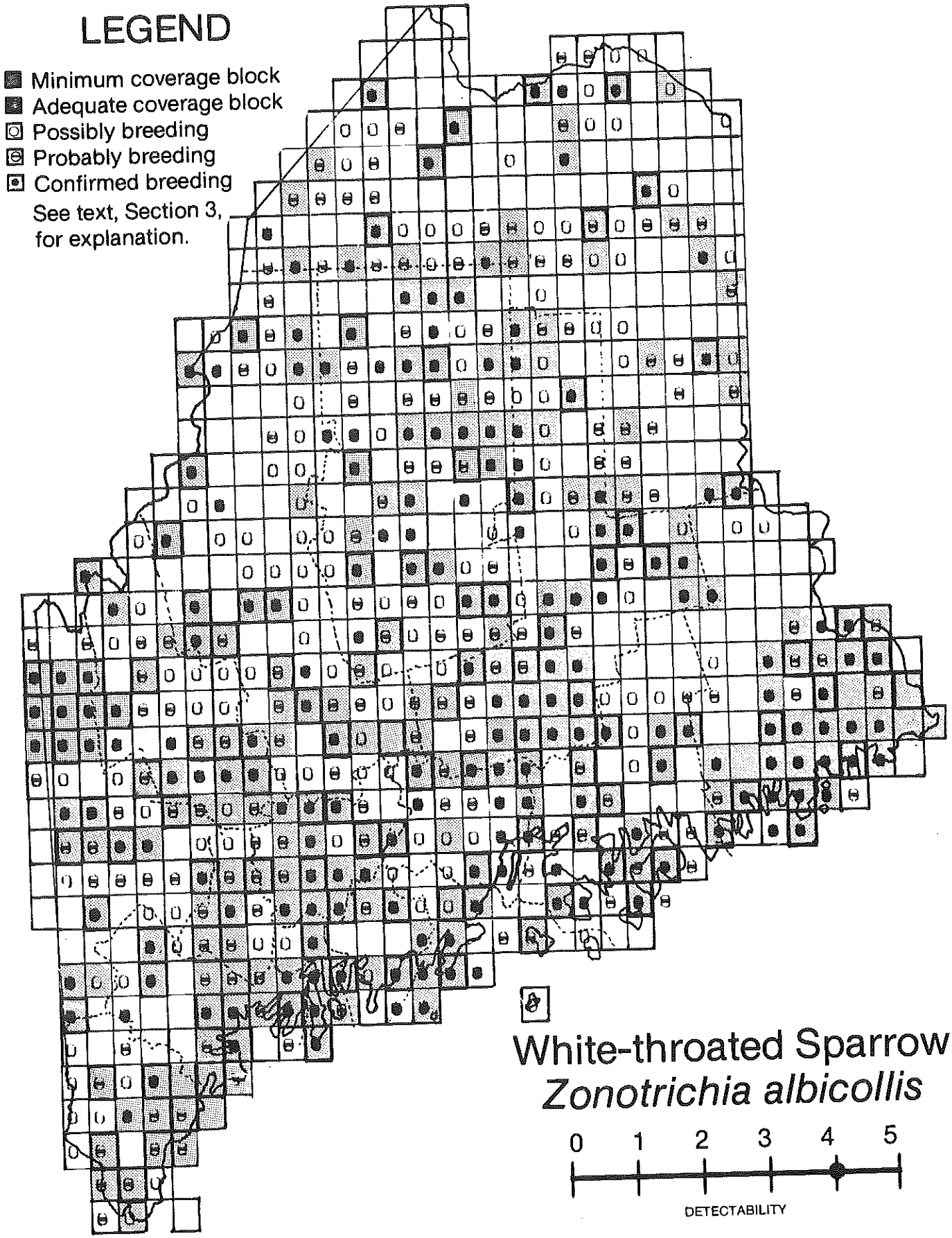


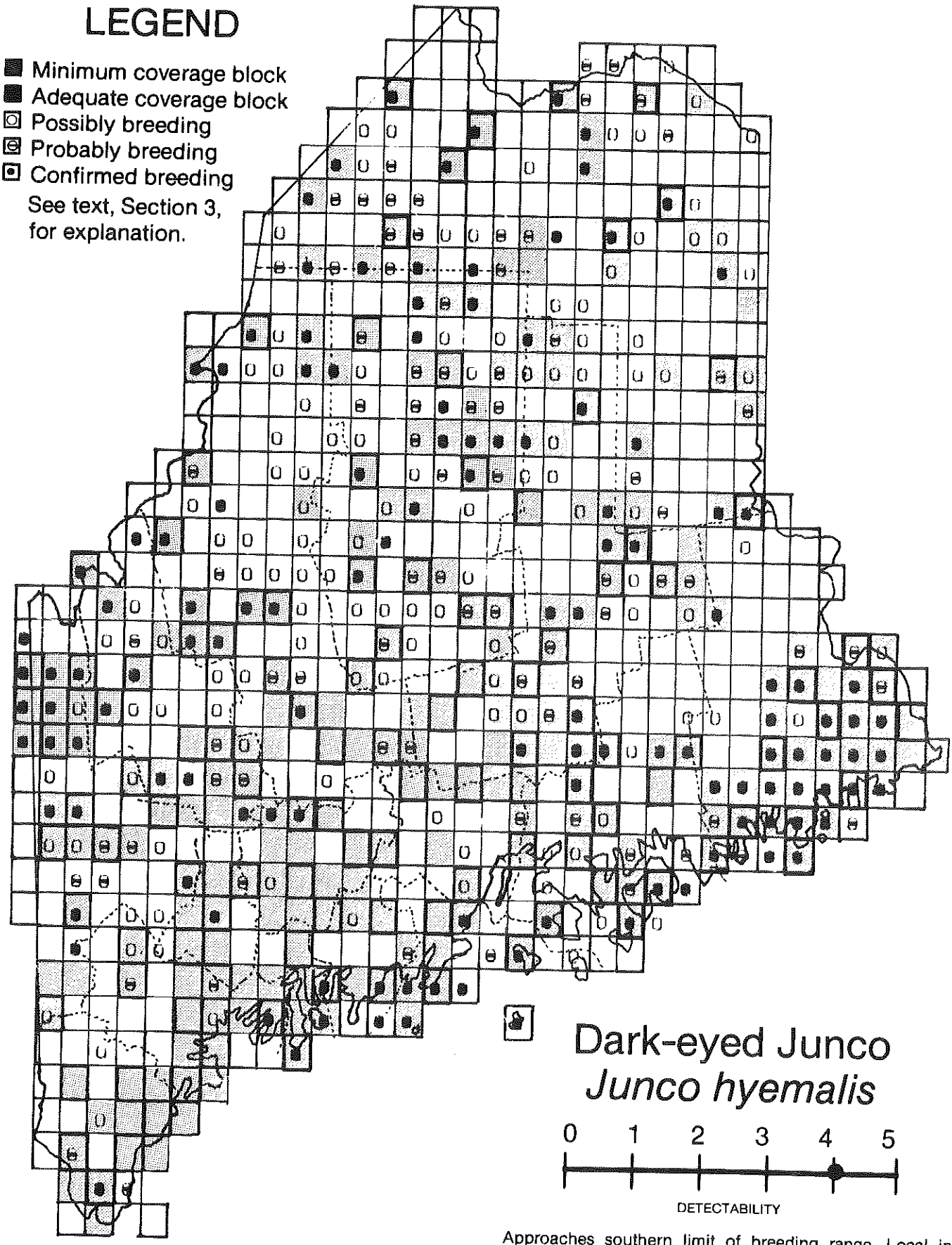
Reaches southern limit of breeding range. First confirmed breeding in 1983.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Song Sparrow
Melospiza melodia
0 1 2 3 4 5
DETECTABILITY

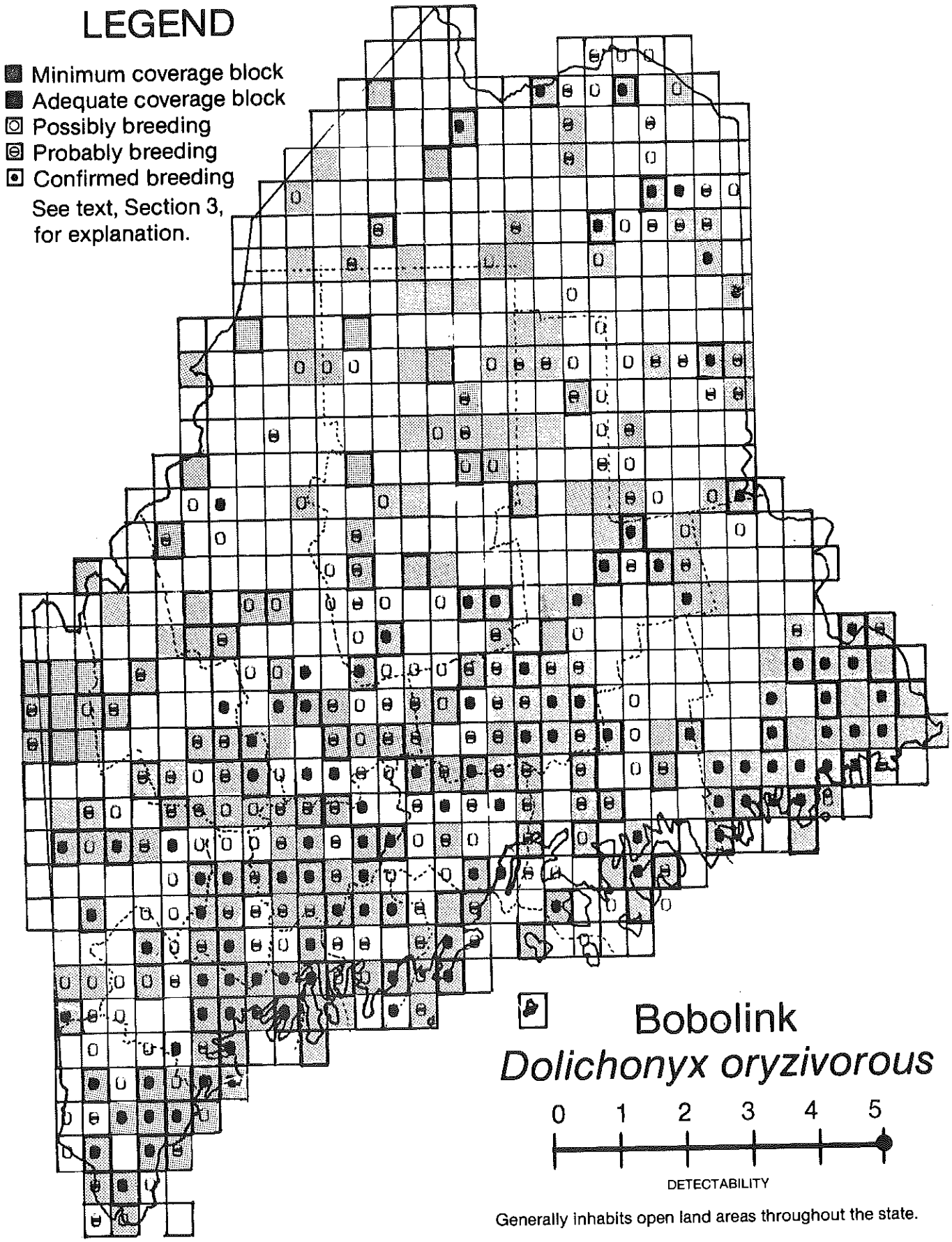

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Lincoln's Sparrow
Melospiza lincolnii
0 1 2 3 4 5
DETECTABILITY
Reaches southern limit of breeding range.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Swamp Sparrow
Melospiza georgiana
0 1 2 3 4 5
DETECTABILITY

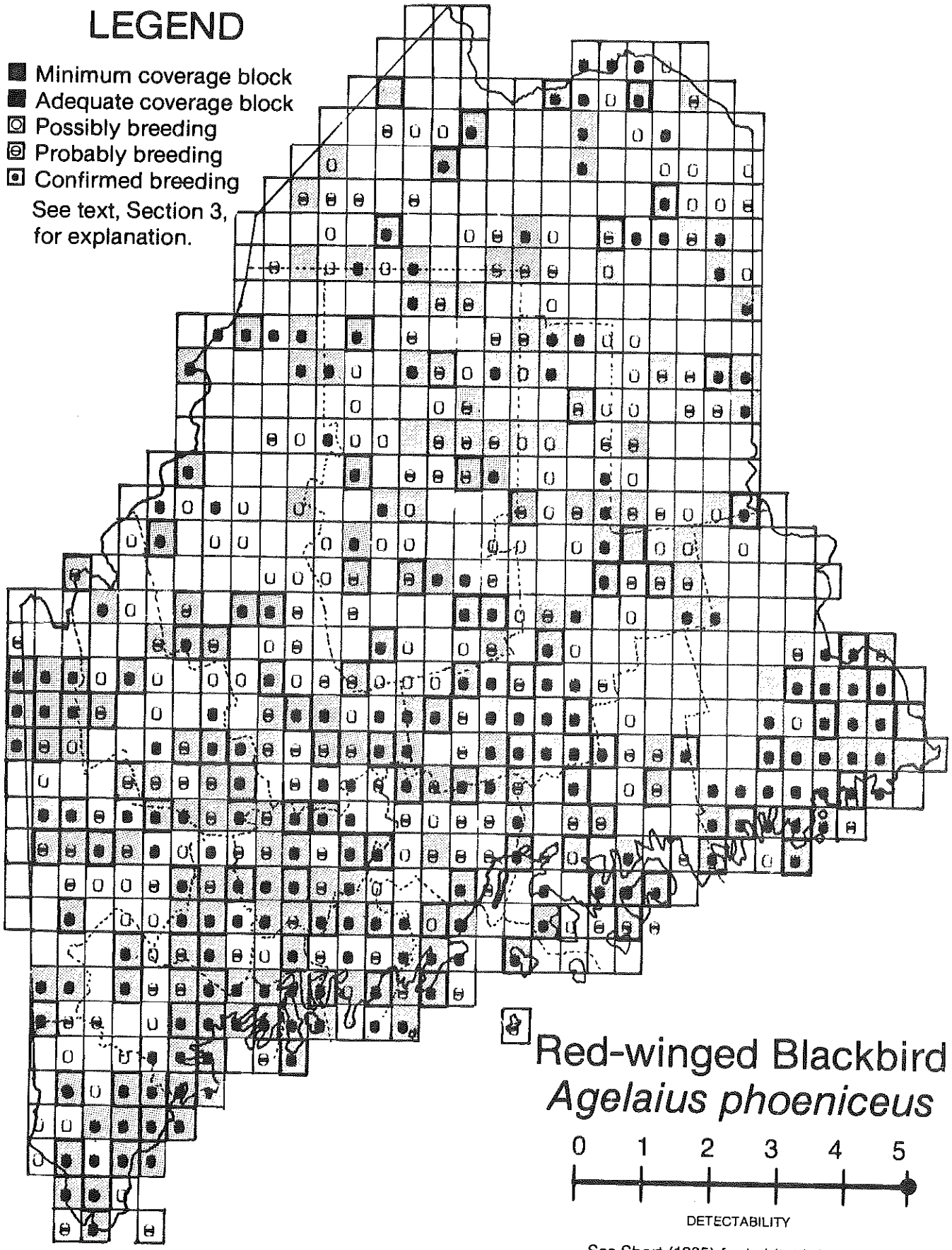

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
White-throated Sparrow
Zonotrichia albicollis
0 1 2 3 4 5
DETECTABILITY



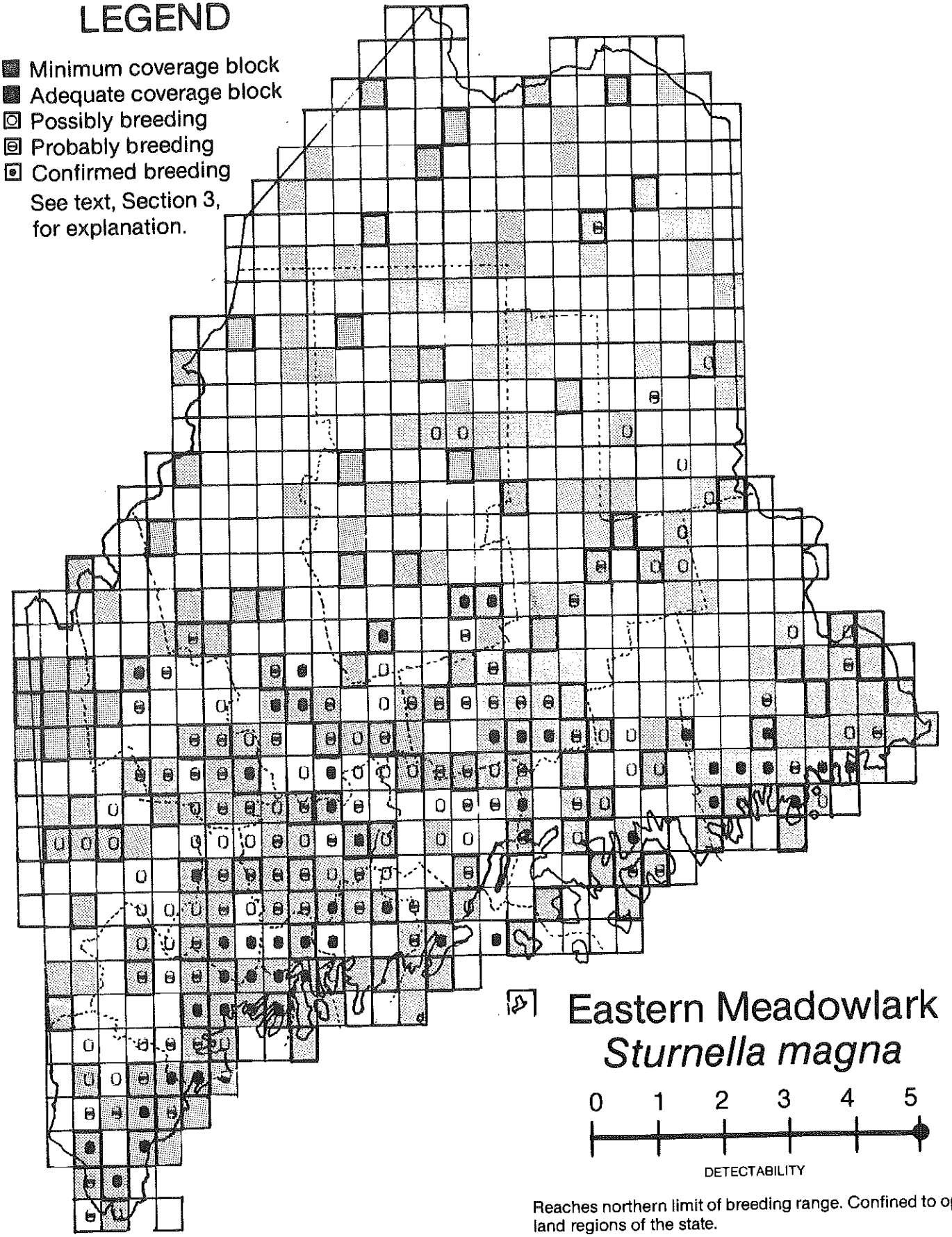
Approaches southern limit of breeding range. Local in southwestern part of the state.



Generally inhabits open land areas throughout the state.

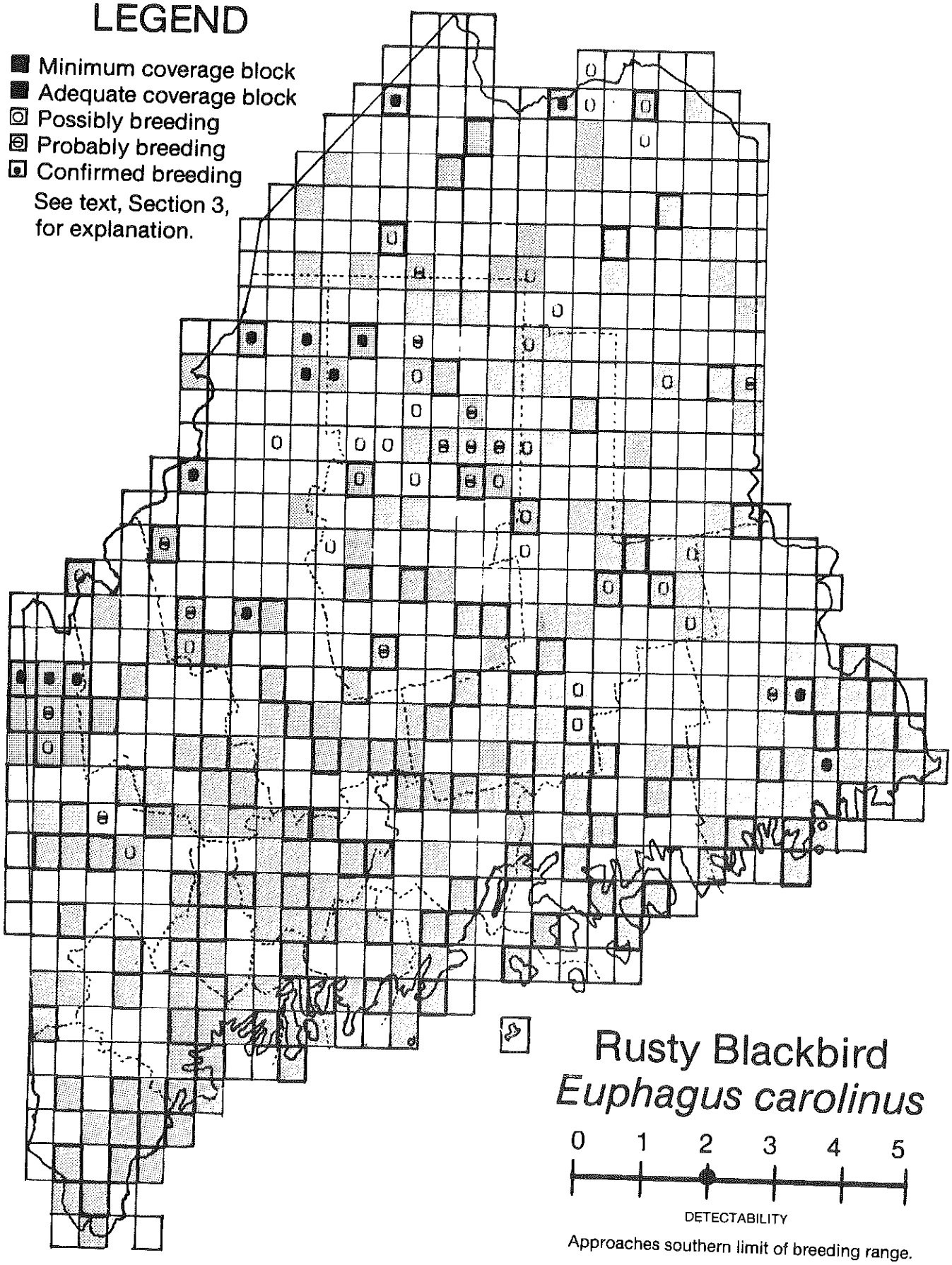


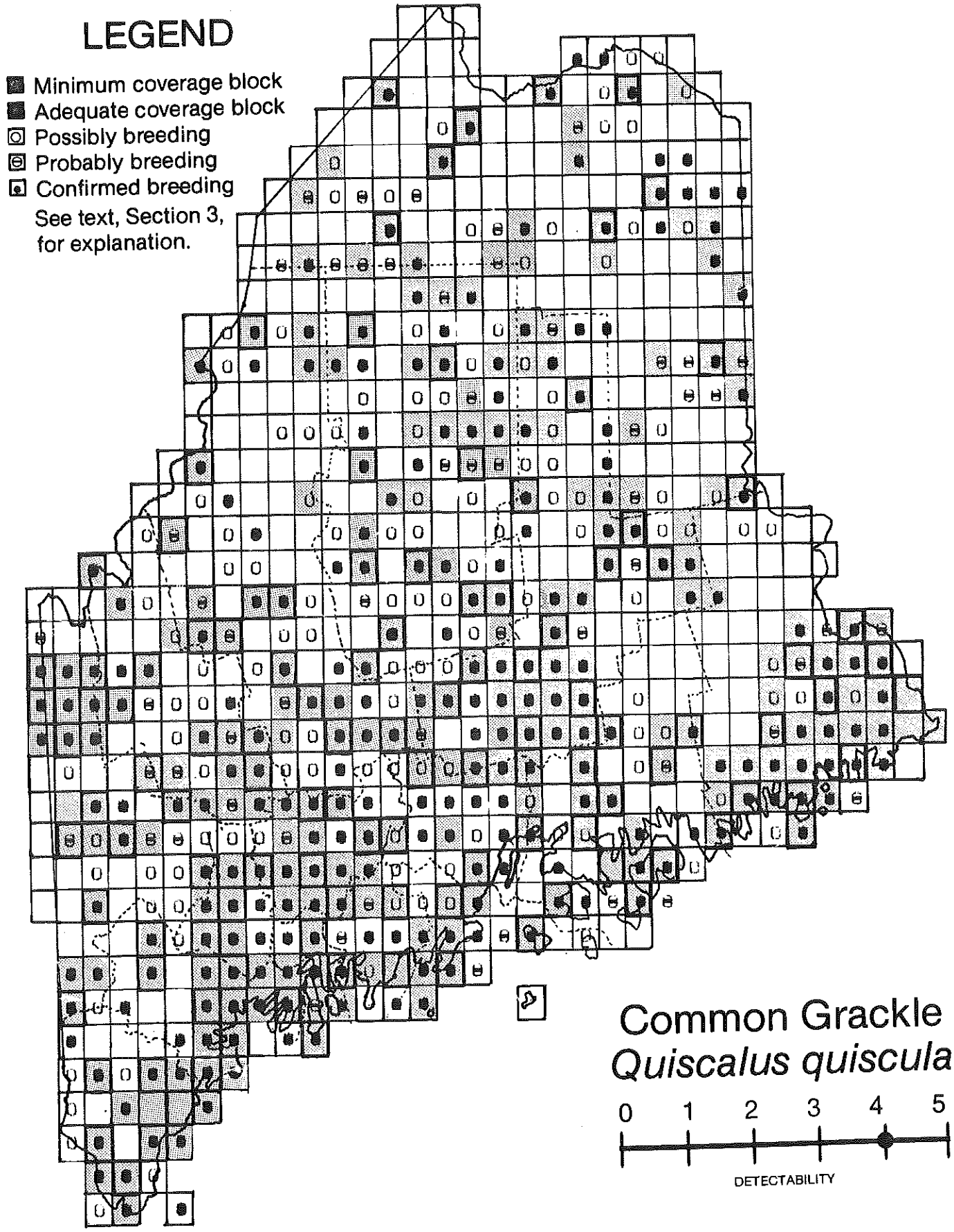
See Short (1985) for habitat information.

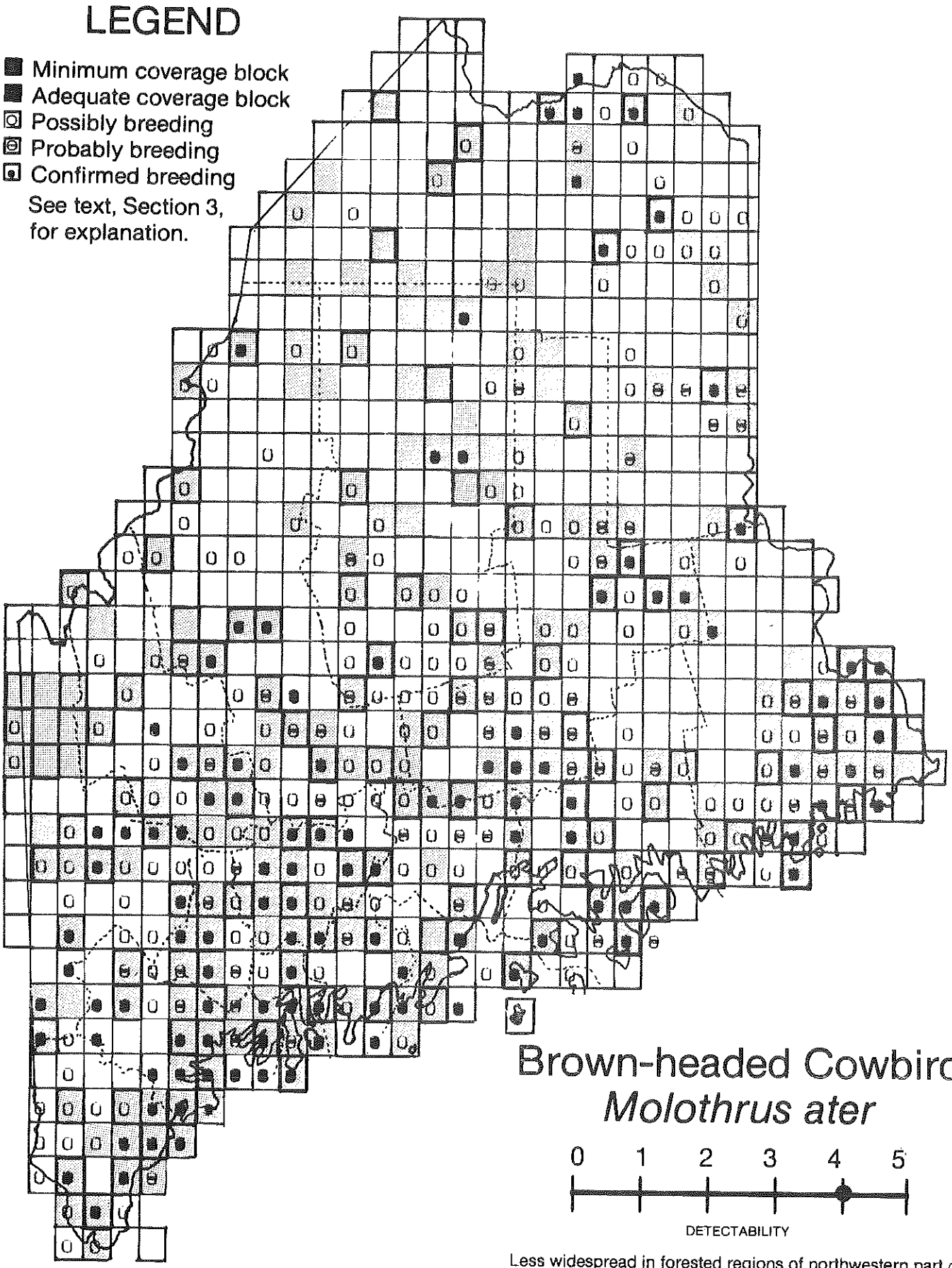


Eastern Meadowlark
Sturnella magna

Reaches northern limit of breeding range. Confined to open land regions of the state.

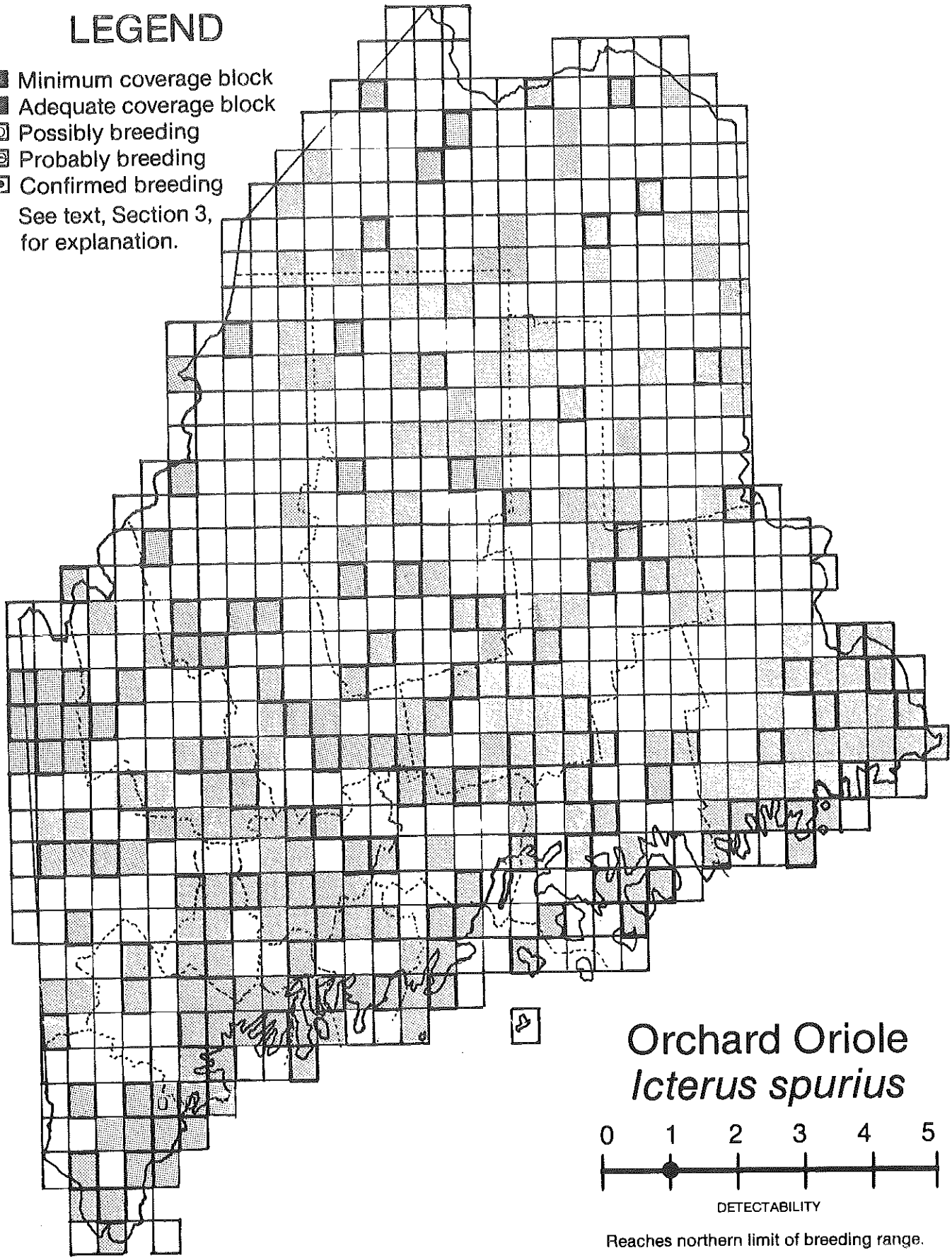

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Rusty Blackbird
Euphagus carolinus
0 1 2 3 4 5
DETECTABILITY
Approaches southern limit of breeding range.

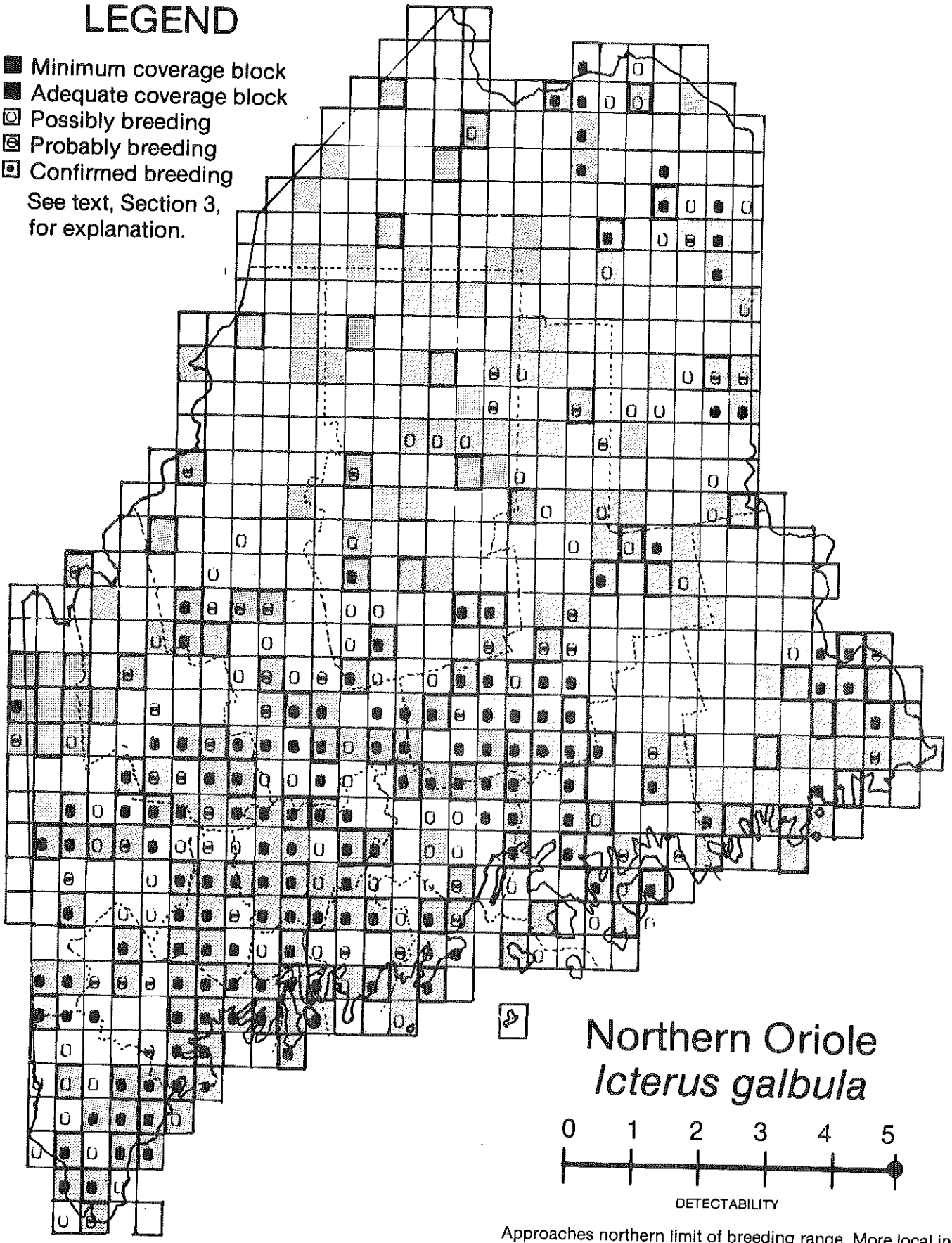

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Common Grackle
Quiscalus quiscula
0 1 2 3 4 5
DETECTABILITY



Brown-headed Cowbird
Molothrus ater

Less widespread in forested regions of northwestern part of the state. See Ficker (1967).


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Orchard Oriole
Icterus spurius
0 1 2 3 4 5
DETECTABILITY
Reaches northern limit of breeding range.

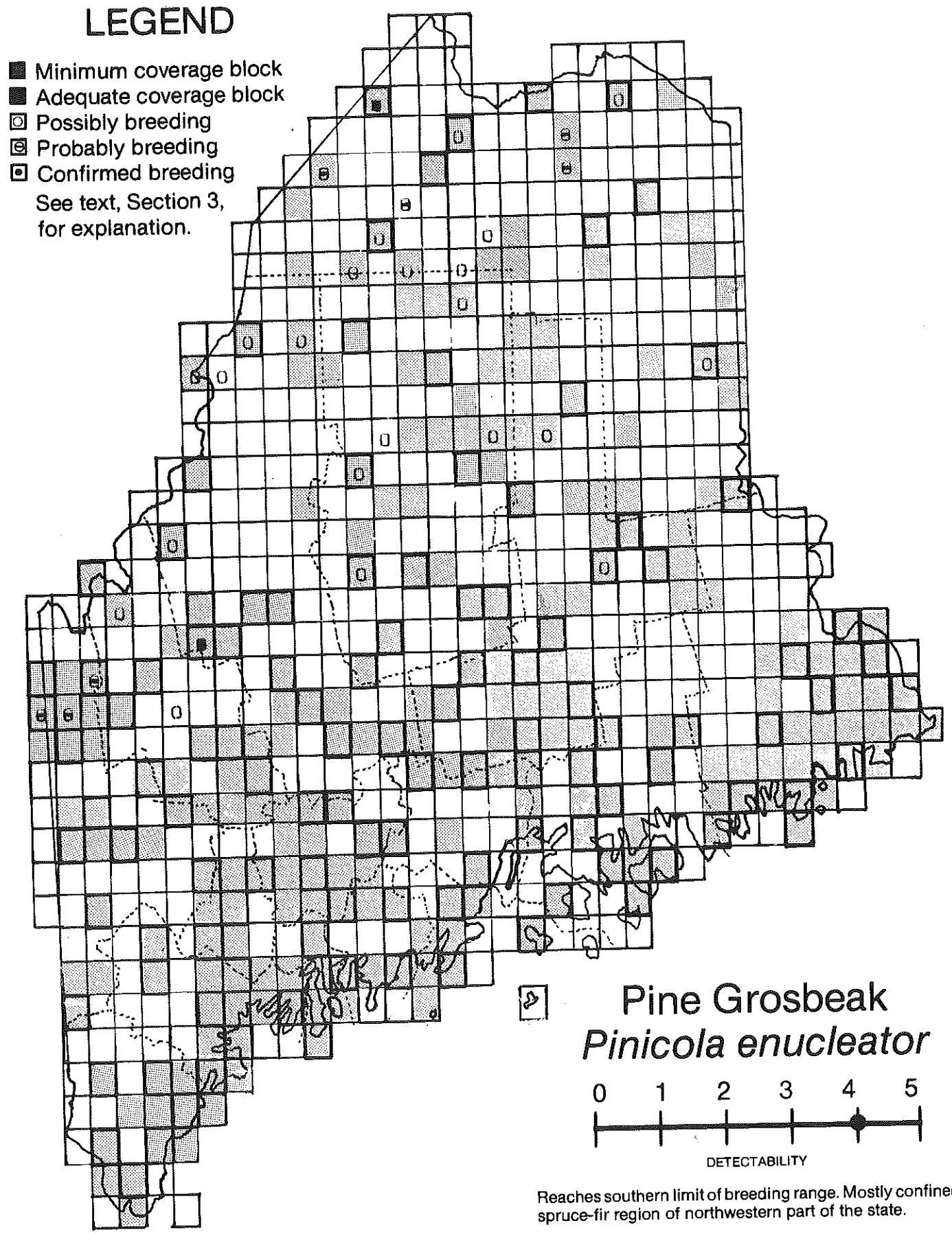


Northern Oriole
Icterus galbula

0 1 2 3 4 5

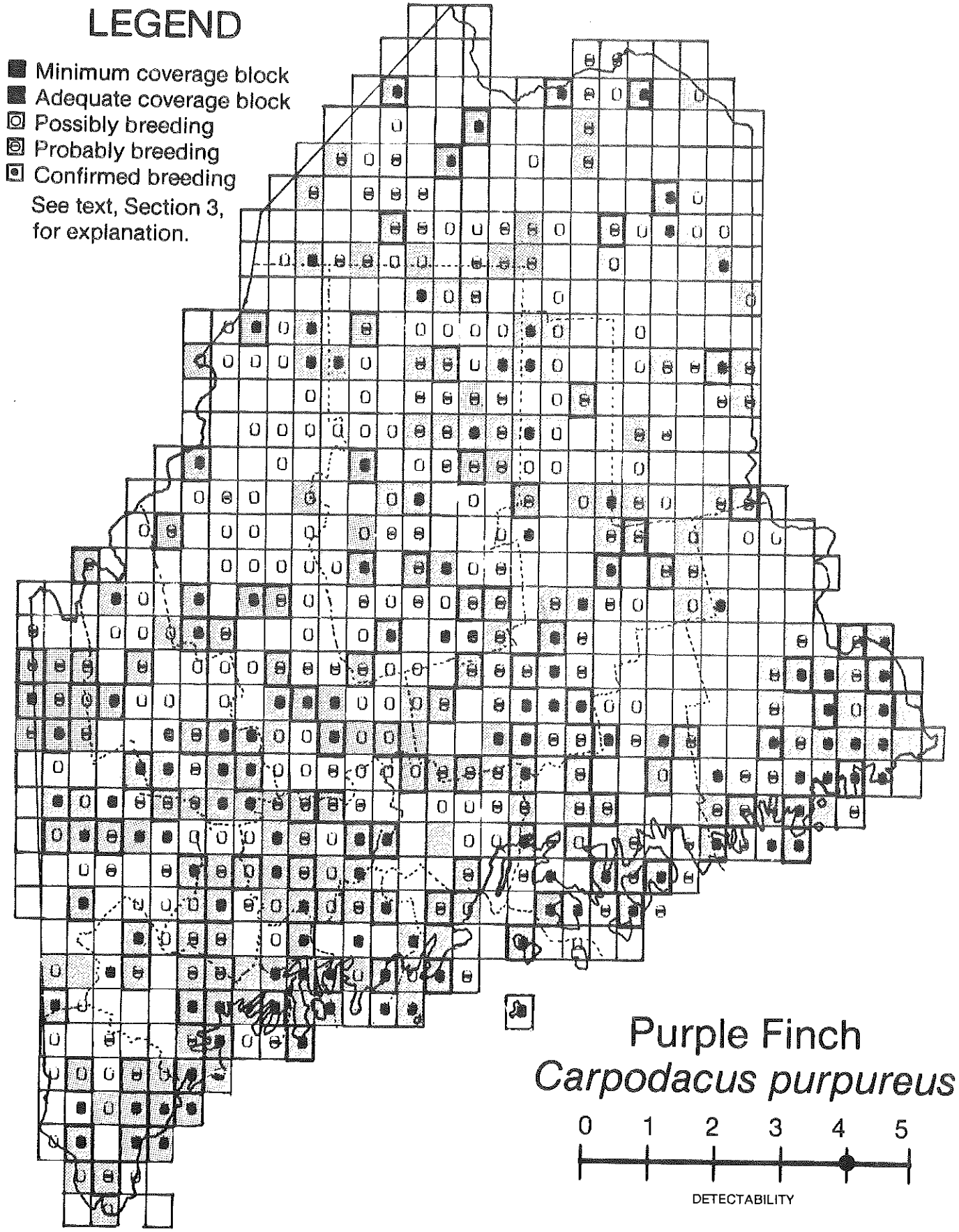
DETECTABILITY

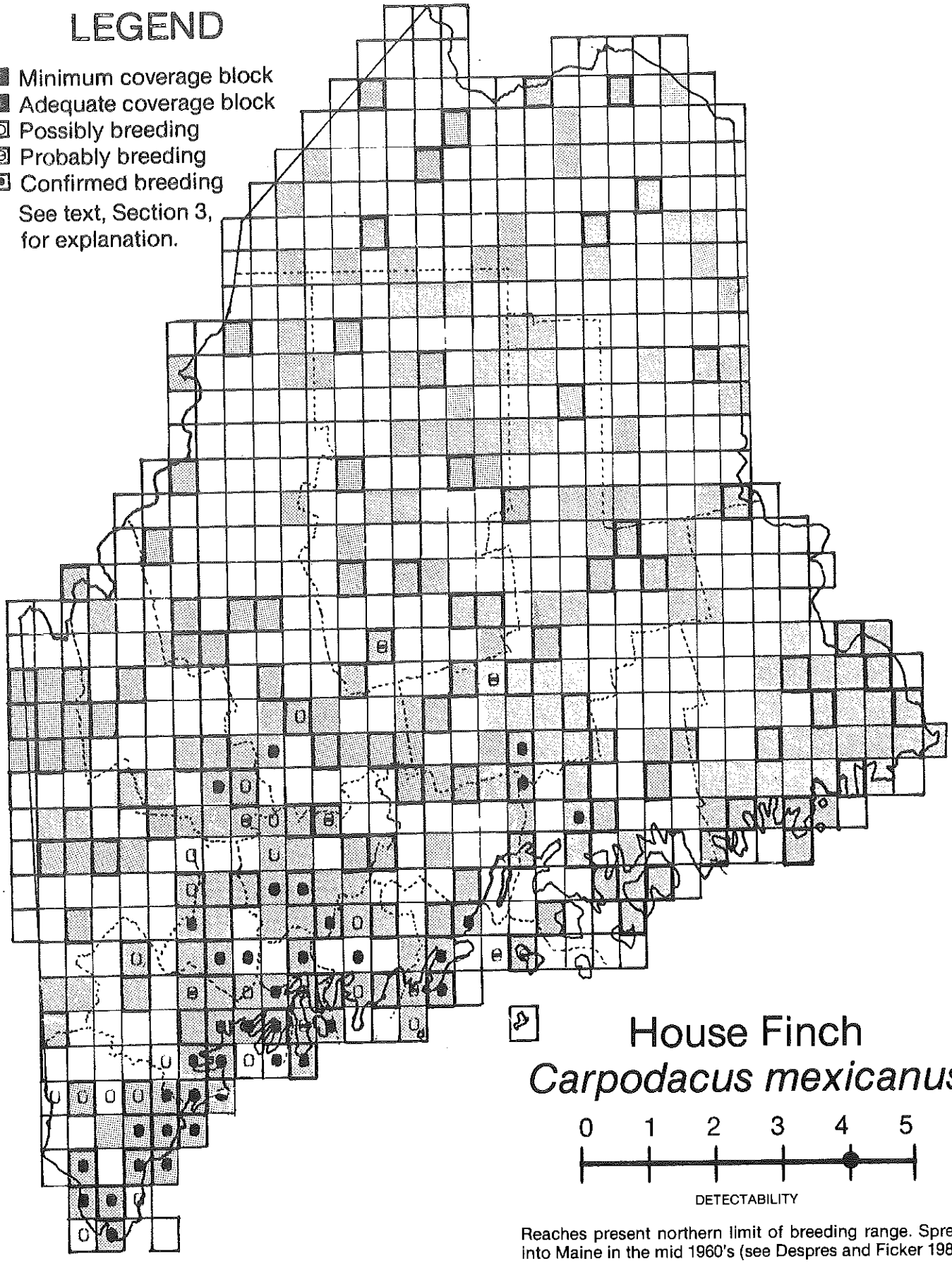
Approaches northern limit of breeding range. More local in heavily forested regions.



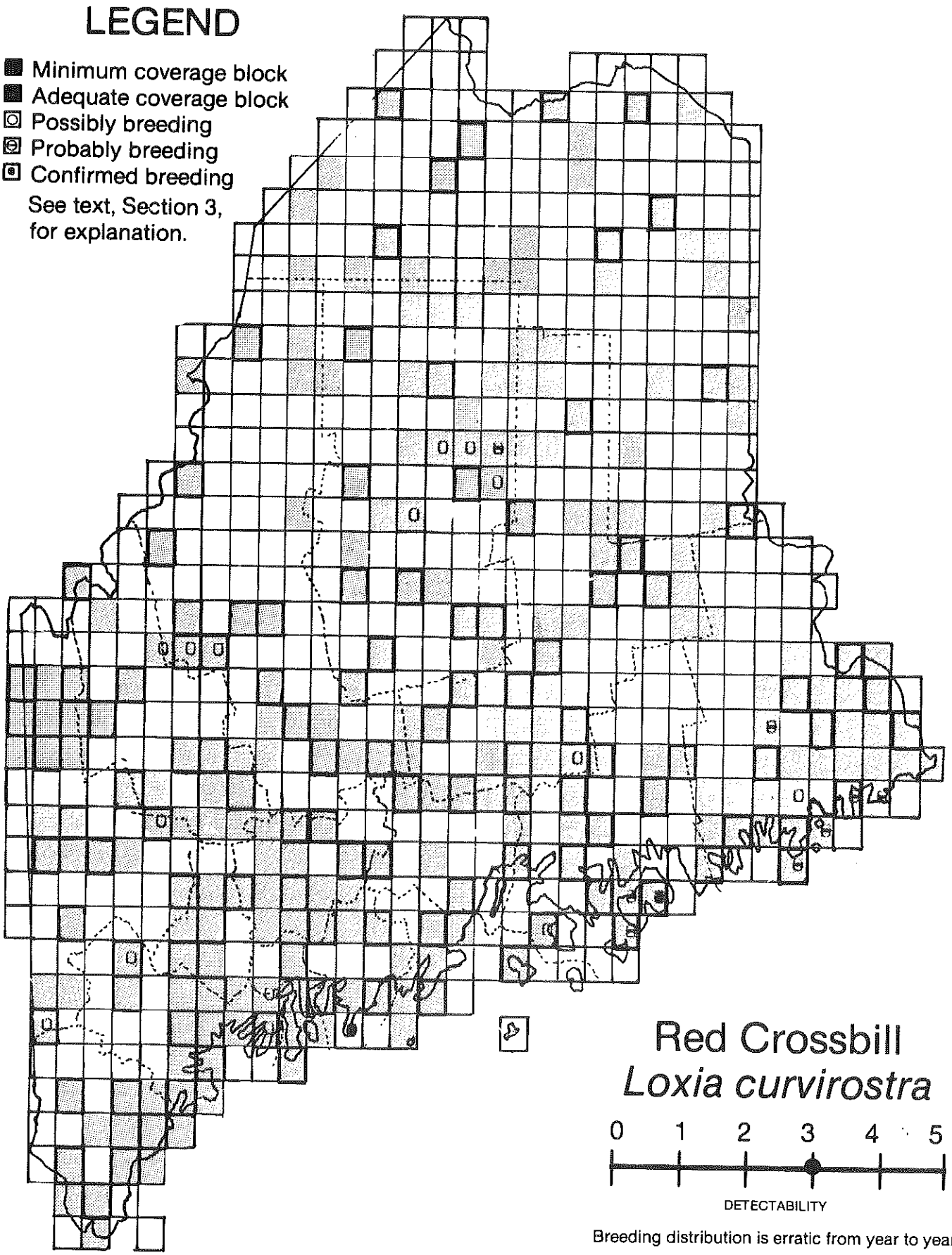
Pine Grosbeak
Pinicola enucleator

Reaches southern limit of breeding range. Mostly confined to spruce-fir region of northwestern part of the state.

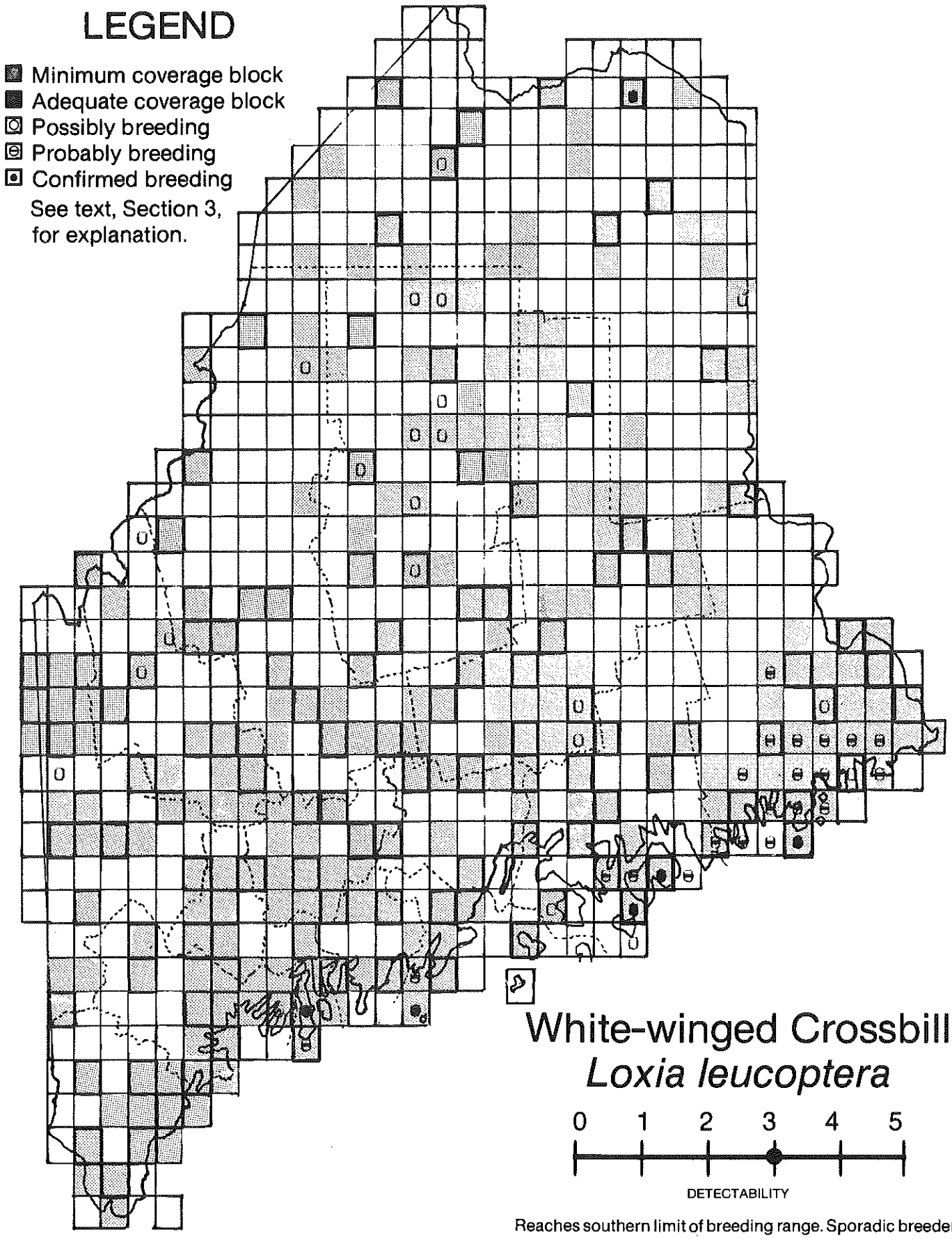

LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
Purple Finch
Carpodacus purpureus
0 1 2 3 4 5
DETECTABILITY



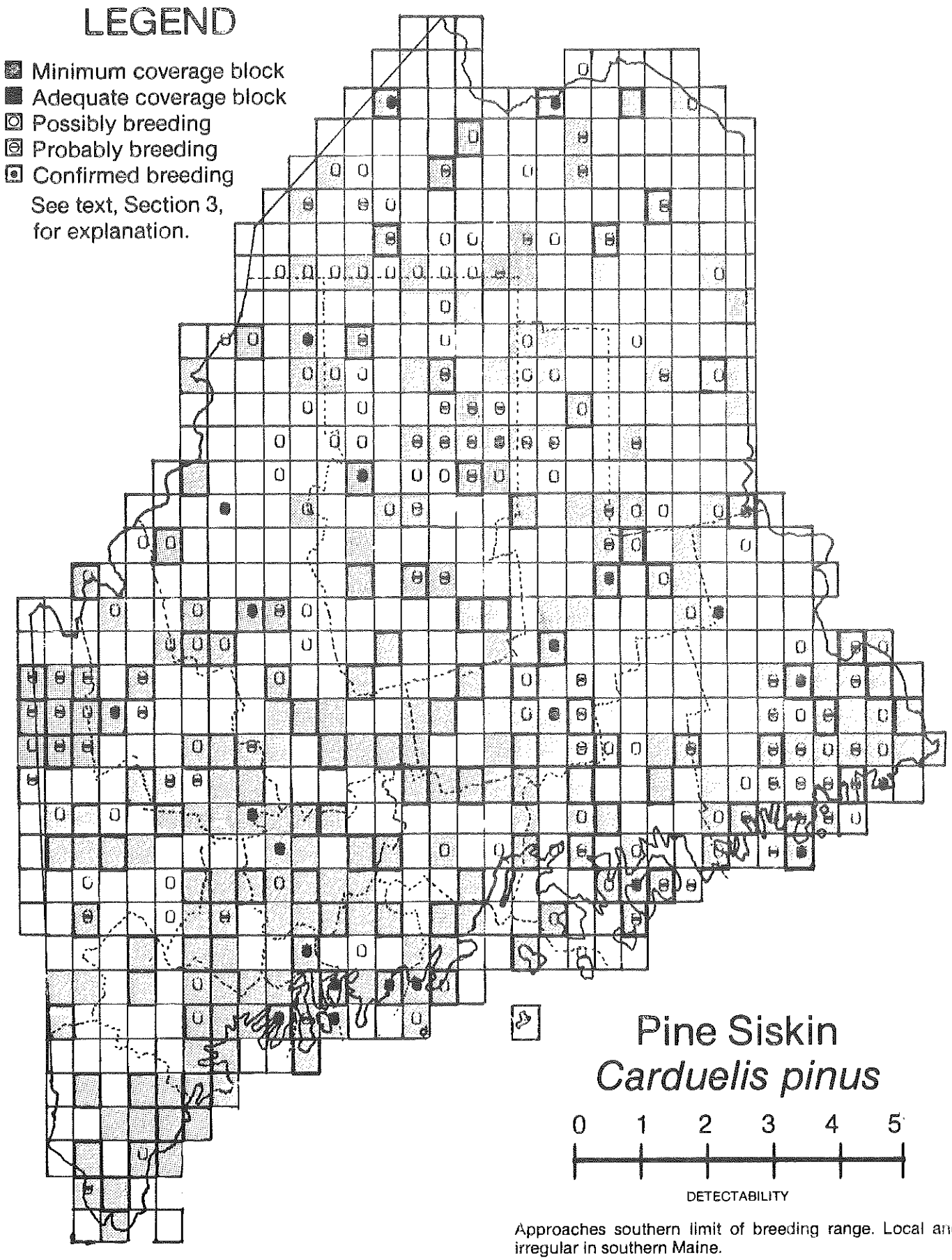
Reaches present northern limit of breeding range. Spread into Maine in the mid 1960's (see Despres and Ficker 1982). Increasing.



Breeding distribution is erratic from year to year.



Reaches southern limit of breeding range. Sporadic breeder.

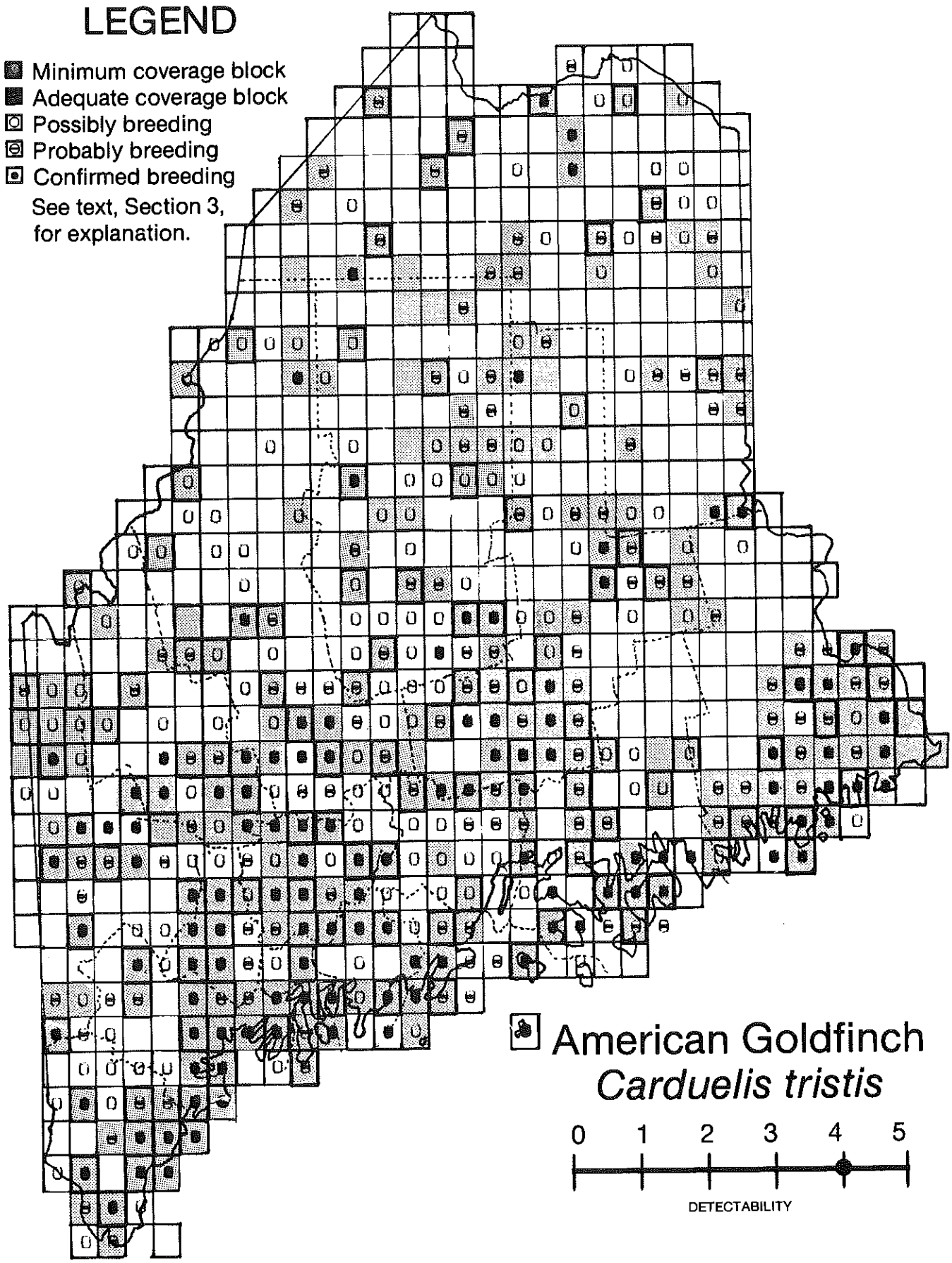


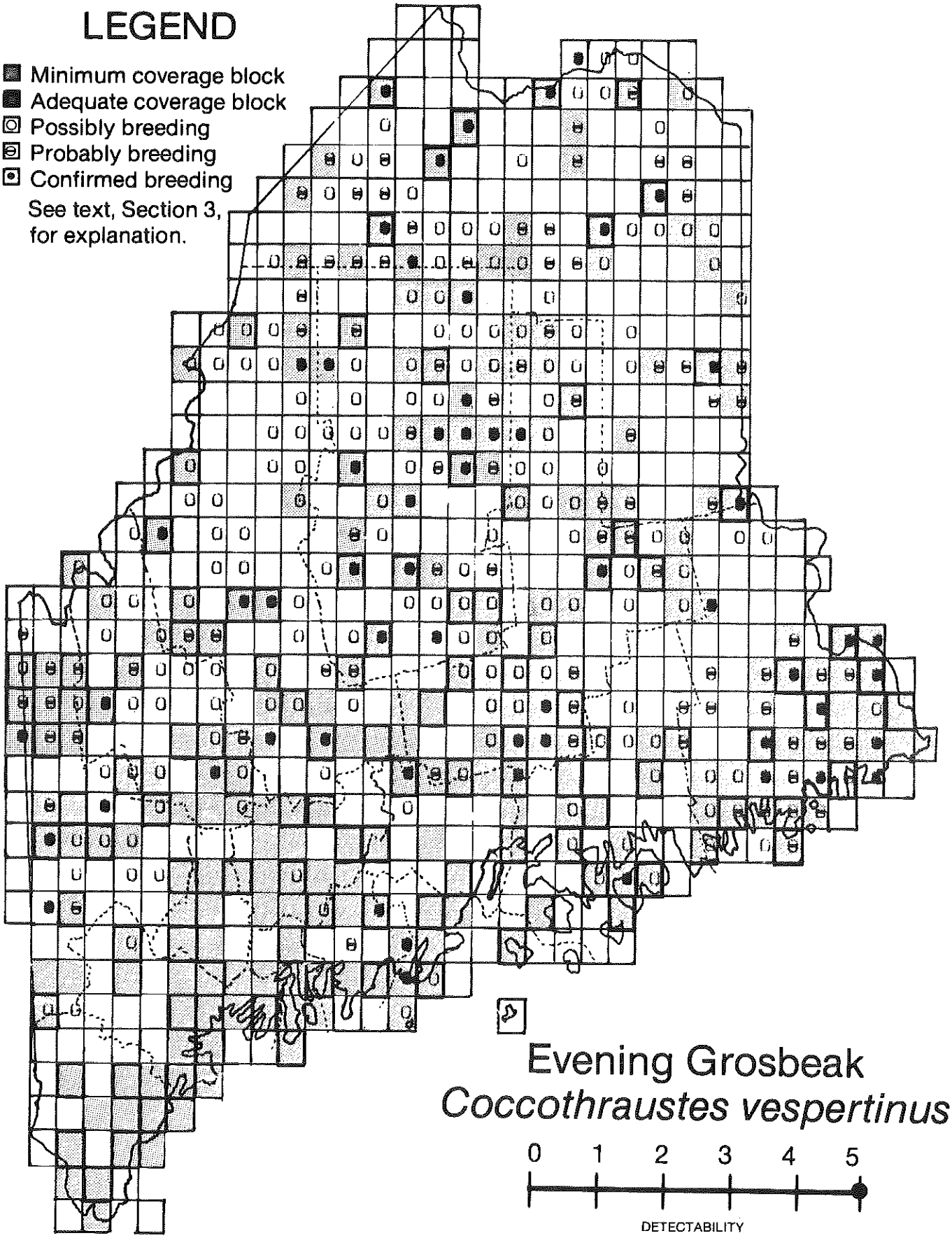
Pine Siskin
Carduelis pinus

0 1 2 3 4 5

DETECTABILITY

Approaches southern limit of breeding range. Local and irregular in southern Maine.


LEGEND
Minimum coverage block
Adequate coverage block
Possibly breeding
Probably breeding
Confirmed breeding
See text, Section 3, for explanation.
American Goldfinch
Carduelis tristis
0 1 2 3 4 5
DETECTABILITY



Evening Grosbeak
Coccothraustes vespertinus

Reaches southern limit of usual breeding range. Has increased.

Appendix A. Species of Uncertain Breeding Status

In addition to the mapped species, the following were recorded during the six-year atlas period. Although none were proven to be breeding birds (excepting the introduced Monk Parakeet), several are species which nested in Maine in the past, and others have bred, or currently breed in adjacent Canadian provinces or in the lower New England states, and therefore might be expected to breed in Maine. If any of these presently nest within the state, they certainly do so on a rare and irregular basis.

MANX SHEARWATER (*Puffinus puffinus*) Block 45.

A Manx Shearwater that vocalized several nights between June 11 and July 4, 1980 over Eastern Egg Rock in Muscongus Bay reportedly exhibited behavior uncharacteristic of pelagic wanderers found in the Gulf of Maine in summer. Manx Shearwaters were discovered nesting in Massachusetts in 1973 and in Newfoundland in 1977.

NORTHERN GANNET (*Sula bassanus*) Block 292.

A Northern Gannet present from July 6 to late September, 1983 constructed a nest and brooded two large buoys in a *dory* moored off Eastport in Cobscook Bay. Because the bird met atlas criteria, it is included here despite the unlikely choice of nest site and aberrant behavior. The nearest breeding colonies are in the Gaspé region of Quebec and Newfoundland, although in the 1800's the species nested nearby at Gannet Rock in the Grand Manan archipelago, New Brunswick.

NORTHERN PINTAIL (*Anas acuta*) Blocks 47, 240.

Single males were seen in mid-June at Palmyra and Brownfield Bog. The Pintail breeds in the neighboring provinces of Quebec and New Brunswick.

BUFFLEHEAD (*Bucephala albeola*) Blocks 338, 698.

A drake was photographed June 13, 1979 at St. Agatha in northern Aroostook County, and another was seen south of Blanchard. Except for an isolated Vermont breeding record, the Bufflehead is not known to nest in the Northeast-Maritimes area.

MERLIN (*Falco columbarius*) Blocks 200, 599, 690.

Historically the "pigeon hawk" is of rare but regular summer occurrence, but no substantiated nesting record exists. The atlas received three possible Merlin reports indicating continued summer presence, but failing to provide evidence of breeding. The species breeds rarely at similar latitudes in Quebec and Nova Scotia.

AMERICAN OYSTERCATCHER (*Haematopus palliatus*) Block 61.

Two Oystercatchers were present from mid-May to July 27, 1982 and again during June and July of 1983 in the Martinsville-The Brothers area. The species was only recently documented as a bird of Maine, but it is expanding its range northward on the East coast and breeds in Massachusetts.

LEAST SANDPIPER (*Calidris minutilla*) Block 41.

An individual was observed performing typical courtship flights July 14 and 15, 1983 over a salt marsh in Maquoit Bay, Brunswick. The Least Sandpiper nested on Monomoy Island, Massachusetts in 1979, and on Machias Seal Island, New Brunswick in 1982.

MONK PARAKEET (*Myiopsitta monachus*) Block 22.

Introduced: date and origin of release unknown. Monk Parakeets nested in Cape Elizabeth in 1979 and successfully wintered 1979-1980. In spring these birds rebuilt the nest (which had blown down), and probably bred again before USFWS personnel removed a total of ten birds in late summer. Reports of Monk Parakeets persisted through summer and fall of 1981.

EASTERN SCREECH-OWL (*Otus asio*) Blocks 29, 52, 155, 254, 284, 285, 287.

Former breeder: no documented nesting record in recent history. With the exception of a red-phase bird seen April 26, 1979 on Mount Desert Island, reports of Screech-Owls were based on vocalizations. Four of these reports are clustered in Washington County.

SHORT-EARED OWL (*Asio flammeus*) Blocks 221, 244.

A territorial pair performing courtship flights was present in Brewer March 24-May 7, 1982, but breeding was not confirmed. The perennial presence of Short-eared Owl suggests that it may nest in Maine; however, there exists no documented breeding record for the state. This owl nests as close by as New Brunswick and Quebec.

RED-HEADED WOODPECKER (*Melanerpes erythrocephalus*)

Former breeder: nested in 1926 and 1927 in Cumberland County. There are no subsequent reports of breeding despite very sporadic summer occurrence. The Red-headed Woodpecker currently breeds sparingly in southern New England.

SEDGE WREN (*Cistothorus platensis*) Blocks 22, 137, 201, 222, 280, 356.

Former breeder: no records for several years. Although atlasers reported a scattering of Sedge Wrens, none were ever relocated or verified as breeding. The species may no longer exist as a breeding bird in the Northeast.

LOGGERHEAD SHRIKE (*Lanius ludovicianus*) Blocks 134, 234, 239, 243.

Former breeder: no recent nesting record. Except for three birds seen together in Palmyra in late July of 1981, others reported were apparently unmated individuals. Like the Sedge Wren, the Loggerhead Shrike has disappeared from much of its former breeding range in the Northeast.

GOLDEN-WINGED WARBLER (*Vermivora chrysoptera*)

A Golden-winged Warbler, seen singing in suitable habitat, was present for at least one week in June, 1980 at South Berwick. The species breeds in Massachusetts and other New England states.

CLAY-COLORED SPARROW (*Spizella pallida*)

Individuals were singing for several weeks in Lincoln (1978), and Freeport (1982). The Clay-colored Sparrow is expanding its range eastward.

Appendix B. Participants in the Atlas Project

Adamus, Paul
Allen, Lewis
Allen, Tom
Almy, Chris
Alverson, L.
Anderson, Anita
Anderson, Dick
Anderson, Donald
Arnold, W.H.
Babb, Susan
Bahrt, S.
Bahrt, Sid
Ball, Greg & Leda
Ballinger, Gary
Barden, Albert
Barker, Bruce
Beers, Dennis
Bell, Mary
Bengtson, Paul
Berry, Jim
Bertrand, Timothy
Black, Susan
Bochan, Bonnie
Bond, James
Borror, Art
Boss, Sarah
Boucher, David
Boyd, Inez
Bozenhard, Phil
Bradstreet, Sue
Bridge, Burrill
Bridgham, Martin
Brown, Anne
Brown, Bud
Brown, Harold
Bryan, Janet
Burgason, Barry
Burke, Robert
Burrell, James
Burson III, Sherman
Butler, Anne
Cadbury, Bart
Cannell, Amanda
Cannell, Peter F.
Caron, John
Cass, Phyllis
Cates, Manley
Cayer, Murial
Chasse, Claudette
Cherry, Jeff
Chivers, Jane
Choate, L.
Choate, Luther
Clark, Eleanor
Clark, R.D.
Claybourne, Richard
Conkling, Phil
Conover, Garrett
Cook, Sherwood
Cooper, Ray
Corr, Patrick
Corrigan, Paul
Cote, Rena
Crabtree, Mary
Crawford, Robert
Cross, Peter
Cross, Richard
Crossley, Alan
Crowell, Kenneth
Davis, Marcia
Davison, Art
DeGraaf, Richard
DeWan, Terry
Dearborn, Sadie
Despres, Jody
Donahue, Paul
Donovan, Gary
Dorchester, Charles
Dorso, James
Dow, Bruce
Downs, Phil
Drury, William H.
Dudek, Michael
Dudley, J.
Dumont, Eugene
Dunbar, Annette
Dunn, Peter
Eakin, Richard
Eastman, Les
Eckler, J.
Eckler, James
Eldridge, Warren
Ellis, Mary
Ellison, Walter
Elwell, Jery
Emerson, William
Etzel, Bing
Evans, Lorna
Everett, S.
Famous, Connie
Famous, Norm
Fanning, Mark
Fefer, S.
Ferris, C.

Ferris, Craig
Fiore, Joe
Fiore, Joseph
Flagg, Stan & Gale
Folger, David
Fowler, J.
Freese, Gail
French, Madeline
Frew, Venetia
Frey, L.
Frings, Hubert
Fry, Lew
Galle, Janet
Gamble, Ed
Gammons, Kay
Gauditz, Barbara
George, Dorothy
Getchell, Sr., David R.
Gibbs, James
Gibson, James
Gifford, Madeline
Gillis, M.
Gillis, Muriel
Giovanella, Alice
Godfrey, Susan
Gorman, Celia
Gove, Jeffrey
Graham, Frank
Gramlich, Francis
Granger, Eric
Gray, Joseph
Grover, Mary
Haggan, Dorothy
Haines, David
Hall, James
Halpin, Margy
Halplin, N.
Hancock, Bill
Hardy, Joanne
Hasey, Harland
Hayward, Thomas
Hogan, Kass
Holler, Nancy
Hoppins, P.
Howe, Anne
Howes, Wendy
Howland, John
Hundley, Margaret
Hunter, Malcolm
Huntington, Charles
Hutchinson, Alan
Hutchinson, Russell
Isherwood, Scott
Jellison, Constance
Johnson, E.
Johnson, Mary
Johnson, Paul
Johnson, Ralph & Marion
Johnson, William
Jones, Doris
Kelly, Edith
Kennett, Eril
Kennington, John
Kenniston, Scott
Kesselheim, Craig
Kidder, Lucille
Kleinholtz, Paul
Klyver, Z.
Kress, Stephen
LaCase, Lucy Lee
Lebrun, Al
Lebrun, Jane
Ledlie, Pat
Lee, Sally
Leeper, Paul
Libby, Mark
Libby, Russell
Long, Bud
Longcore, Jerry
Lucey, Michael
Lucey, Patrick
Lucey, Phillip
Madeira, Jay
Mairs, Don
Major, John T.
Mallett, Sandy
Marcus, Mickey
Marin, Dora
Martin, Nancy
Matulaitis, Mrs. Ben
McCarty, Donna
McConnachie, Mrs. & Mr.
McConnell, Mr. & Mrs.
McCullough, M.
McCullough, Mark
McKinnon, R.
McReel, Nancy
McWilliams, Philip
Melvin, Scott
Mendall, Howard
Merriam, Paul
Metcalf, Jon
Miller, Brent
Mills, Maury

Mitchell, Betsy
Mitschele, Marsha
Moberg, Peter
Mollicone, Marilyn
Morgan, John
Morgan, Lanny
Morse, Sam
Mudge, John
Murphy, M.S.
Nead, Janet E.
Nicholson, C.
Nickerson, Dan
Nishumma, Anne
Noble, William
Nurse, Andrea & Bill
Nuttall, Donald
Oliver, David
Oliveri, Kris
Oliveri, Stephen
Owen, Ray B.
Owens, Margaret
Paige, Lisa
Palmer, Ralph
Paul, Frank
Peabody, Mildred
Peary, Gaynol
Peckham, Donald
Pelletier, Roland
Piel, Barbara
Pierce, Virginia
Pierson, Liz & Jan
Plymire, Margery
Potter, Robert
Preston, T.
Preston, Tyrone
Probert, Randall
Purkis, John
Quirk, Jack
Ravesies, Phyllis
Reichel, Jo
Reimer, Don
Rendall, Rick
Richards, Penelope
Ringleman, James
Robbins, Chandler
Robbins, George & Andrea
Roberts, Stephen
Robertson, John
Rollins, Jeanne
Rooney, Sally
Ross, N.
Ross, Nellie
Roy, Scott
Russell, Will
Sanborn, George
Sanders, Lowell
Sargent, Phillip
Sargent, Priscilla
Saunders, David
Sawyer, George
Scherer, Beth & Joe
Scott, M.
Scott, Mark
Sepik, Greg
Sheck, Amy
Sheldon, Lynn
Simon, Irma
Skaling, Tom
Smith, Jerry
Snyder, Ellen
Spalding, Sue
Sparks, Mrs. G.
Spaulding, Dorothy
Spencer, Steve
Spinney, Russell
Spofford, Walter
Stadler, Mark
Stark, Paul
Stevens, Kevin
Stiffel, Sandra
Stocking, Fred & Ann
Stockwell, Sarah
Strong, Paul
Swain, Marjorie
Swanson, Mrs. R.
Sweetser, William
Taylor, Avery
Thompson, Robert
Todd, Charles
Townsend, Bill
Trombley, Melvin
Trudeau, James
Turnbull, P.
Tyler, Mary
Van Keuren, Alison
Van Os, Joseph
Van Rotz, Bob
Verkruysse, Arlene
Vickery, Barbara
Vickery, Peter
Wagner, Jo
Waldron, Nan
Wehl, Otis
Wehmeyer, Bee

Wellman, Alice
Wellman, Brad
Wells, Jeff
Weston, Donald
Weston, Steve
Weston, Theodora
Wheelwright, George C.
Whitney, Chuck
Whitton, H.
Wiles, Leslie
Williams, David
Witham, Jack
Woodward, Clyde
Wright, Nancy
Yaukey, Peter
Yeaton, Mrs. G.
Yorks, Stewart

Appendix C. Bibliography of Maine Ornithology

Emphasis is on technical literature (i.e., not popular articles) published since 1949. Literature cited in the text, not all of it dealing directly with Maine, is also included below. In addition, extensive unpublished data on Maine's birdlife exists in the notebooks of some birders, as well as databases mentioned on page 16 and in limited-circulation publications noted on page 15.

Adamus, P.R. 1970. Annotated list of the summer birds of Swan Island Wildlife Management Area. Appendix C. In: Merrymeeting Bay: A guide to conservation of a unique resource. Maine Dept. of Conservation, Augusta.

Adamus, P.R. 1976. A preliminary listing of noteworthy natural features in Maine. Maine State Planning Office, Augusta. 397 pp.

Adamus, P.R. 1976. The natural regions of Maine. Center for Natural Areas report to the Maine State Planning Office, Augusta. 125 pp.

Adamus, P.R. 1977. Ecological Resources. Appendix E. Dickey-Lincoln Transmission Line Environmental Impact Statement. Center for Natural Areas Report to U.S. Department of Energy (Bonneville Power Administration), Portland, OR. 943 pp.

Adamus, P.R. 1979. Marine Birds. Vol. 1 of: An oil pollution abatement and management study for Penobscot Bay, Maine. Center for Natural Areas, Normandeau Associates, and Seacoast Ocean Services report to Department of Environmental Protection, Augusta.

Adamus, P.R. 1979. Marine Birds. 268 pp. In: A Summary and analysis of environmental information on the Continental Shelf from the Bay of Fundy to Cape Hatteras. Center for Natural Areas report to the U.S. Bureau of Land Management, New York, N.Y.

Adamus, P.R. 1982. Waterbirds of the Kennebec, Sheepscot, and Damariscotta River Estuaries: Summary of monthly maxima, with notes on selected tidal species. Unpublished report to Maine Department of Inland Fisheries and Wildlife, Bangor, ME.

Adamus, P.R. 1982. Waterbirds of the Kennebec, Sheepscot, and Damariscotta River Estuaries: Shorebird field survey and literature review. Unpublished report to Maine Department of Inland Fisheries and Wildlife, Bangor, ME.

Adamus, P.R. 1983. Shorebirds feeding in Muscongus Bay, 1983. Unpublished report to Maine Department of Inland Fisheries and Wildlife, Bangor, ME.

Adamus, P.R. 1983. Waterbirds of Muscongus Bay: Summary of monthly maxima, 1973 -1983. Unpublished report to Maine Department of Inland Fisheries and Wildlife, Bangor, ME.

Adamus, P.R. 1983. A wildlife baseline for northwestern Maine

forests. Report to Appalachian Mountain Club, Pinkham Notch, NH. 19 pp.

Adamus, P.R., H.L. Brown, P.C. Leeper. 1985. Long term environmental monitoring study (second year report). Maine Forest Service, Augusta.

Albright, J.J. 1981. Behavioral and physiological responses of coastal wintering black ducks to changing weather in Maine. M.S. Thesis, University of Maine. 72 pp.

Bagg, A.M. and H.M. Parker. 1951. The turkey vulture in New England and eastern Canada up to 1950. Auk 68:327.

Barter, L.S. 1968. A population of Maine-banded wood ducks. M.S. Thesis. University of Maine. 109 pp.

Bond, J. 1950. The ruby-crowned kinglet in Maine in Maine and the Maritimes. Bulletin of the Maine Audubon Society 6(1): 9.

Bond, J. 1951. Blackpoll warblers in Maine and the Maritime Provinces. Bulletin of the Maine Audubon Society 7(1): 2-6.

Bond, J. 1953. Additional notes on blackpoll warblers. Bulletin of the Maine Audubon Society 9(2): 34-35.

Bond, J. 1971. Native birds of Mount Desert Island. Second revised edition, Academy of Natural Sciences of Philadelphia.

Bourget, A.A. 1972. Interrelationships of eiders, herring gulls, and black-backed gulls nesting in mixed colonies in Penobscot Bay, Maine. M.S. Thesis. University of Maine. 121 pp.

Bourget, A.A. 1973. Relation of eiders and gulls nesting in mixed colonies in Penobscot Bay, Maine. Auk 90(4): 809-820.

Brown, H.L. 1976. Effects of Imidan on songbirds. Report to Stauffer Chemical Company by Eco-Analysts, Inc., Bath, ME.

Brown, H.L. 1977. Effects of Sumithion on songbirds. Report to Stauffer Chemical Company by Eco-Analysts, Inc., Bath, ME.

Brown, H.L. 1978. Effects of Lannate on songbirds. Report to DuPont Chemical Company by Eco-Analysts, Inc., Bath, ME.

Brown, H.L. 1978. Effect of Matacil on the forest environment. Report to Mobay Chemical Company by Eco-Analysts, Inc., Bath, ME.

Brown, H.L. 1979. Effects of carbaryl on forest organisms. Report to Maine Forest Service by Eco-Analysts, Inc., Bath, ME.

Buchheister, C.W. 1968. Razorbill nesting at Matinicus Rock, Maine. Auk 85:324.

Burger, J. and M. Gochfeld. 1981. Unequal sex ratios and their consequences in herring gulls. Behav. Ecol. Sociobiol. 8:125-128.

Burgason, B.N 1977. Bird and mammal use of old commercial clearcuts in northern Maine. M.S. Thesis. University of Maine. 53 pp.

Cade, B.S. and P.J. Sousa. 1985. Habitat suitability index models: ruffed grouse. Biol. Rep. 82 (10.86). U.S. Fish and Wildl. Serv., Ft. Collins, CO. 31 pp.

Cannell, P.F. 1980. The fish crow in Maine. Maine Bird Life 4(1): 7-8.

Capen, D.E. 1972. Establishing breeding populations of wood ducks by relocating wild broods. M.S Thesis. University of Maine. 57 pp.

Carter, B.C. 1952. The American goldeneye in central New Brunswick. M.S. Thesis. University of Maine. 121 pp.

Chamberlain, G.D. 1949. The birds of Aroostook County. Bulletin of the Maine Audubon Society 5(3): 43-58.

Cherry, J.D. 1979. A checklist of the summer birds of the Baker Lake region , Somerset County. Maine Bird Life 3(3): 31-32.

Cherry, J.D. 1982. Fat deposition and length of stopover of migrant white-crowned sparrows. Auk 99(4): 725-732.

Choate, J.S. 1966. Breeding biology of the American eider in Penobscot Bay, Maine. M.S.Thesis. University of Maine. 173 pp.

Christenson, B.L. 1981. Reproductive ecology of and response to disturbance by common loons in Maine. M.S.Thesis. University of Maine. 51 pp.

Christenson, B.L. and J.A. Sherburne. 1981. Effects of boating activity on nesting common loons in Maine. Trans. Northeast Sect. Wildl. Soc. 38: 151.

Clark, S.H. 1968. The breeding ecology and experimental management of the American eider in Penobscot Bay, Maine. M.S. Thesis. University of Maine. 169 pp.

Clark, S. H., H.L. Mendall, and W. Sarbello. 1974. Use of artificial nest shelters in eider management. Research in the Life Sciences 22(2). University of Maine. 15 pp.

Collins, S.L. 19893. Geographic variation in habitat structure for the wood warblers in Maine and Minnesota. Oecologia 59:246-252.

Corr, P.O., G.G. Donovan, and H.E. Spencer. 1977a. Woodcock management plan. Maine Department of Inland Fisheries and Wildlife, Augusta.

Corr, P.O., G.C. Donovan, and H.E. Spencer. 1977b. Ruffed grouse management plan. Maine Department of Inland Fisheries and Wildlife, Augusta.

Corr, P.O., G.C. Donovan, and H.E. Spencer. 1977c. Ring-necked pheasant management plan. Maine Department of Inland Fisheries and Wildlife, Augusta.

Cote, R.T. 1976. Bird-finding in southern Maine. Mimeo. 13 pp.

Coulter, M.W. and W.R. Miller. 1968. Nesting biology of black ducks and mallards in northern New England. Bull. 68-2. Vermont Fish and Game Dept., Montpelier.

Coulter, M.W. 1953. Mallard nesting in Maine. Auk 70:490.

Coulter, M.W. 1954. Some observations of mallards in Central Maine. Bulletin of the Maine Audubon Society 10(2):20-22.

Coulter, M.W. 1955. Spring food habits of surface-feeding ducks in Maine. J. Wildl. Manage. 19: 263-267.

Coulter, M.W. and W.R. Miller. 1968. Nesting biology of black ducks and mallards in northern New England. Bull. 68-2. Vermont Fish and Game Dept., Montpelier.

Cowger, J. 1975a. Alcids and petrels nesting on the Maine coast. Critical Areas Program, Maine Stat Planning Office, Augusta.

Cowger, J. 1975b. The leach's petrel in Maine. Critical Areas Program, Maine State Planning Office, Augusta.

Crawford, H.S., R.W. Titterington, and D.T. Jennings. 1983. Bird predation and spruce budworm populations. J. Forestry 81:433-435.

Crenshaw, W.J. 1974. Relocating broods of wild ducks to establish breeding populations. M.S. Thesis. University of Maine. 46 pp.

Cruickshank, A.D. 1950. Summer birds of Lincoln County. National Audubon Society, Medomak, Maine.

Day, R.L. 1950. The geographic distribution of wildlife in Maine. Bull. Maine Audubon Soc. 9:54-62.

Degraaf, R.M. and N.M. Chadwick. 1984. Habitat classification: a comparison using avian species and guilds. Environ. Manage. 8: 511-518.

Despres, J. 1983. Breeding habitat of the blue-gray gnatcatcher. Maine Bird Life 5(4): 36-38.

Despres, J. and J. Ficker. 1982. Maine's first house finch? Maine Bird Life 4(3):37.

DeWindt, C. 1952. Summer birds on Harpswell Neck. Bulletin of the Maine Audubon Society 7(3):58-59.

Dixon, L.L. 1978. Breeding biology of the savannah sparrow on Kent Island. Auk 95(2): 235-246.

Dorr, D.K. 1976a. Least tern nesting habitat in Maine and its relevance to the Critical Areas Program. Planning report 11, Maine State Planning Office, Augusta.

Dorr, D.K. 1976b. Piping plover nesting habitat in Maine and its relevance to the Critical Areas Areas Program. Planning report 15. Maine State Planning Office, Augusta.

Drury, W.H. 1973. Population changes in New England seabirds. Bird-banding 434: 267-313.

Drury, W.H. 1974. Population changes in New England seabirds, part II. Bird-banding 45:1-15.

Drury, W.H. and J.A. Kadlec. 1974. The current status of the herring gull population in the northeastern United States. Bird-banding 45:297-306.

Drury, W.H., D. Folger, and G. Conover. 1980. Monitoring the effects of spraying for spruce budworm on songbirds in Maine, 1979. pp. 50-96. In: Environmental monitoring reports from the 1979 Maine Cooperative Spruce Budworm Suppression project. Maine Forest Service, Augusta.

Dunford, R.D. 1971. The summer behavior of American woodcock in central Maine. M.S. Thesis. University of Maine. 98 pp.

Eakin, R.R. 1984. Annotated list of the birds of Back Cove, Portland, Maine. Maine Bird Life 6(3):32-48.

Elliott, C.A. 1982. Integrating forest and wildlife management on International Paper Company's Northern Experimental Forest. M.S. Thesis. University of Maine. 65 pp.

Erskine, A.J. 1977. Birds of boreal Canada. Rep. Ser. No. 41. Canadian Wildl. Serv., Ottawa.

Erwin, R.M. and C.E. Korschgen. 1979. Coastal waterbird colonies: Maine to Virginia, 1977. FWS/OBS-79/08. U.S. Fish and Wildlife Service, Washington, D.C. 647 pp.

Famous, N. 1979. Terrestrial birds. Chapter 16. In: S.I. Fefer and P.A. Schettig (eds.). An ecological characterization of coastal Maine. FWS/OBS-80/29. U.S. Fish and Wildlife Service, Newton Corner, MA.

Famous, N. and C. Ferris. 1979. Waterbirds. Chapter 14. In: S.I. Fefer and P.A. Schettig. An ecological characterization of coastal Maine. FWS/OBS-80/29. U.S. Fish and Wildlife Service, Newton Corner, MA.

Fefer,S.I. 1976. Waterfowl populations and habitat evaluation--Moosehorn National Wildlife Refuge. M.S. Thesis. University of Maine. 99 pp.

Ferris, C.R. 1977. Effects of Interstate 95 on songbirds and white-tailed deer in northern Maine. PhD dissertation. University of Maine. 48 pp.

Ferris, C.R. 1979. Effects of Interstate 95 on breeding birds in northern Maine. J. Wildl. Manage. 43: 421-427.

Ficken, M.S. 1967. Interaction of a crow and a fledgling cowbird. Auk 84:601-602.

Ficken, M.S. and R.W. Ficken. Responses of four warbler species to playback of teir two song types. Auk 87:296-304.

Finch, D.W., W.C. Russell, and E.V. Thompson. 1978. Pelagic birds in the Gulf of Maine. Am. Birds 32(2):140- 32(3): 281- .

Fobes, C.B. 1959. The mourning dove in Maine. Bulletin of the Maine Audubon Society 15(2): 30-45.

French, T.W. 1979. Great horned owl predation on Leach's storm-petrels in Maine. Auk 96;202.

French, T.W. 1982. Piracy by a great black-backed gull on a shark. Wilson Bull. 94: 96.

Gauthier, J. and J. Bedard. 1976. Dispersal of the common eider in the St. Lawrence Estuary, Quebec, Canada. Nat. Can. 103(4): 261-284.

Getchell, D.R. 1982. Turkey vulture nesting in Camden. Maine Bird Life 4(3): 37-40.

Gibbs, R.M. 1961. Breeding ecology of the common goldeneye in Maine. M.S. Thesis. University of Maine. 113 pp.

Gobeil, R.E. 1963. Fall shorebird migration observed at Biddeford Pool, Maine. Maine Field Nat. 19:102-109; 118-123.

Godfrey, W.E. 1972. Encyclopedie des oiseaux du Quebec. Montreal: Les Editions de L'Homme. 663 pp.

Gramlich, F.J. 1979. Effects of Sevin on songbird brain cholinesterase. pp.107-110. In: Environmental monitoring of the Cooperative Spruce Budworm Control project, Maine, 1978. Maine Forest Service, Augusta.

Hansen, R.W., E. Osgood, and M.L. Hunter. 1982. Effects of spraying with Sevin-4-oil on fruit set and its potential consequences for wildlife in a spruce fir forest. pp.91-122. In: Environmental monitoring reports from the 1981 Maine Cooperative Spruce Budworm Suppression Project. Maine Forest Service, Augusta.

Hartman, F.E. 1960. Ecology of black ducks wintering in the Penobscot Estuary. M.S. Thesis. University of Maine. 142 pp.

Hartman, F.E. 1963. Estuarine wintering habitat for black ducks. J. Wildl. Manage. 27(3):339-347.

Hatch, J.J. 1970. Predation and piracy by gulls at a ternery in Maine. Auk 87:244-254.

Hatch, J.J. 1975. Piracy by laughing gulls: an example of the selfish group. Ibis 117(3): 357-365.

Hebard, F.V. 1959. Waterbirds of Penobscot Bay. Portland Soc. of Natural Hist., Portland.

Hebard, F.V. 1960. The land birds of Penobscot Bay. Portland Society of Natural History, Portland.

Hedberg, J. 1980. Habitat selection by spruce grouse in eastern Maine. M.S. Thesis. University of Maine. 63 pp.

Hensley, M.M. and J.B. Cope. 1951. Further data on removal and repopulation of breeding birds in a spruce-fir forest community. Auk 68:483-493.

Hunt, G.L. 1972. Influence of food distribution and human disturbance on the reproductive success of herring gulls. Ecology 53(6):1051-1061.

Hunt, G.L. and M.W. Hunt. 1973. Habitat partitioning by foraging gulls in Maine and northwestern Europe. Auk 90(4): 827-839.

Hunter, M.L. 1975. Least tern breeding range extension in Maine. Auk 92: 143-144.

Hunter, M.L. 1981. The indirect effects of carbaryl on the behavior of birds. pp. 169-191. In: Environmental monitoring report from the 1980 Maine Cooperative Suppression Project. Maine Forest Service, Augusta.

Hunter, M.L. and J.W. Witham. 1982. Further studies on the indirect effects of carbaryl on the behavior of birds. pp. 35-66. In: Environmental monitoring reports from the 1982 Maine Cooperative Spruce Budworm Suppression Project. Maine Forest Service, Augusta.

Hutchinson, A.E. 1980. A comparison of techniques used to estimate numbers of colonial nesting seabirds. M.S. Thesis. University of Maine. 28 pp.

Hutchinson, A.E. and R.C. Ferrero. 1980. Casco Bay coastal resources inventory. Part I, Marine wildlife of Casco Bay, Maine. Maine Department of Inland Fisheries and Wildlife, Bangor.159 pp.

Hutchinson, A.E. 1983. Marine wildlife inventory of Sheepscot Bay, Maine. Maine Department of Inland Fisheries and Wildlife, Bangor. 147 pp.

Hynson, J.R., J. Cherry, J. Eckler, L.Sheldon, and P.R. Adamus. 1982. A search for possible effects of Orthene on bird reproduction. pp. 165-203 In: Environmental monitoring reports from the 1981 Maine Cooperative Spruce Budworm Suppression Project. Maine Forest Service, Augusta.

Ismail, A.A., S.D. Schemnitz, and F.J. Gramlich. 1974. Bird damage to blueberry fields in Maine. pp.1-13 IN: Research in the

Life Sciences 21(12), University of Maine Agric. Exp. Stn. , Orono.

Kadlec, J.A. and W.H. Drury. 1968. Structure of the New England herring gull population. Ecology 49: 644-676.

Knupp, D.M. 1974. Robin reproduction in DDT treated forests in northern Maine. M.S. Thesis. University of Maine. 74 pp.

Knupp, D.M., R.B. Owen, Jr., and J.B. Dimond. 1976. Pesticide dynamics in robins nesting in contaminated and uncontaminated forests in northern Maine. Can. J. Zool. 54(10): 1669-1673.

Knupp, D.M., R.B. Owen, Jr., and J.B. Dimond. 1977. Reproductive biology of American robins in northern Maine. Auk 94(1):80-85.

Korschgen, C.E. 1976. Breeding status of female American eiders. PhD dissertation. University of Maine. 110 pp.

Korschgen, C.E. 1979. Coastal waterbird colonies: Maine. FWS/OBS-79/09. U.S. Fish and Wildlife Service, Washington, D.C. 83 PP.

Korschgen, C.E., H.C. Gibbs, and H.L. Mendall. 1978. Avian cholera in eider ducks in Maine. J. Wildl. Dis. 14(2): 254-258.

Krohn, W.B. 1969. Patterns of woodcock activities on summer concentration fields in central Maine. M.S. Thesis. University of Maine. 103 pp.

Long, R.H. 1951. A new nesting record of the blackpoll warbler. Maine Audubon Society Bull. 7(1):7-8.

Long, R.H. 1951. A Nesting barred owl on Mt. Desert Island. Maine Audubon Soc. Bull. 7:33-34.

Longcore, J.R. and J.K. Ringelman. 1980. Factors affecting waterfowl breeding density and productivity estimates in the Northeast USA. Trans. Northeast. Sect. Wildl. Soc. 37:169-181.

Longcore, J.R., P.O. Corr, and H.E. Spencer, Jr. 1982. Lead shot incidence in sediments and waterfowl gizzards from Merrymeeting Bay, Maine. Wildl. Soc. Bull. 10(1):3-10.

Lucey, M.K. 1979. The black tern in Maine. Maine Bird Life 1(3):29-31.

Marquat, R.E. 1956. A study of waterfowl productivity on an unmanaged sedge meadow marsh in Maine. M.S. Thesis. University of Maine. 190 pp.

McCullough, M.A. 1981. The feeding ecology of migratory semipalmated sandpipers, short-billed dowitchers, semipalmated plovers, and black-bellied plovers on staging areas in eastern Maine. M.S. Thesis. University of Maine. 67 pp.

McLaughlin, F.L. 1967. Behavior study of the interrelationships of gulls and eiders in mixed breeding colonies of Penobscot Bay,

Maine. Maine Coop. Wildl. Res. Unit. Unpubl. Rep. 41pp. University of Maine, Orono.

Mendall, H.L. 1949. Food habits in relation to black duck management in Maine. J. Wildl. Manage. 13(1):64-101.

Mendall, H.L. 1958. The ring-necked duck in the Northeast. University of Maine Bulletin No. 167, University of Maine Press, Orono.

Mendall, H.L. 1980. Intergradation of Eastern American common eiders. Can. Field-Nat. 94(3): 286-292.

Mendall, H.L. and H.E. Spencer. 1961. Waterfowl harvest studies in Maine, 1948-1957. Game Div. Bull. No. 7. Maine Department of Inland Fisheries and Wildlife, Augusta.

Minot, E.O. 1976. American eider rearing ecology in the Grand Manan Archipelago, New Brunswick. M.S. Thesis. University of Maine. 90 pp.

Mitchell, R.T. 1952. Consumption of spruce budworms by birds in a Maine spruce-fir forest. J. Forestry 387-389.

Morse, D.H. 1968. A quantitative study of foraging of male and female spruce-fir woods warblers. Ecology 49: 779-784.

Morse, D.H. 1971a. The foraging of warblers isolated on small islands. Ecology 52: 216-228.

Morse, D.H. 1971b. Effects of the arrival of a new species upon habitat utilization by two forest thrushes in Maine. Wilson Bull. 83: 57-65.

Morse, D.H. 1976. Variables affecting the density and territory size of breeding spruce-woods warblers. Ecology 57:290-301.

Morse, D.H. 1977. The occupation of small islands by passerine birds. Condor 79:399-417.

Morse, D.H. 1978. Populations of bay-breasted and Cape May warblers during an outbreak of the spruce budworm. Wilson Bull. 90(3): 404-413.

Morse, D.H. 1979. Habitat use by the blackpoll warbler. Wilson Bull. 91(2):234-243.

Morse, D.H. 1981. Foraging speeds of warblers in large populations and in isolation. Wilson Bull. 93:334-339.

Morse, D.H. and C.W. Buchheister. 1979. Bird-Banding 50(2):145-158.

Muskat, R.T. 1983. Transient bird survey of Morse Mountain, Phippsburg, Maine, May 2-June 2, 1983. Mimeo. Bates College, Lewiston.

National Geographic Society. 1983. Field guide to the birds of

North America. National Geographic Society, New York, Ny. 464 pp.

Nicholson, C.P. 1977. The utilization of commercial timber production areas by woodcock in Maine. M.S. Thesis. University of Maine. 50 pp.

Nicholson, W.R. 1953. A study of the breeding waterfowl of Corinna Stream. M.S.Thesis. University of Maine. 118 pp.

Nisbet, I.C.T. 1971. The laughing gull in the Northeast. Am. Birds 25: 677-683.

Oliveri, S.F. and N.C. Famous. 1983. A comparison of bird populations in moribund and healthy spruce-fir stands in Maine. pp.93-128. In: Environmental monitoring reports from the 1982 Maine Cooperative Spruce Budworm Suppression Project. Maine Forest Service, Augusta.

Packard, C. M. 1953. Evening grosbeaks summering in Maine and New Brunswick. Maine Audubon Soc. Bull. 9(1):7-12.

Palmer, R.S. 1949. Maine Birds. Bull. Mus. Comp. Zool., Vol. 102. Harvard College, Cambridge, Mass. 656 pp.

Palmer, R. S. 1949. Notes on birds of the Upper Allagash. Maine Audubon Soc. Bull. 5(4):63-76.

Peppard, J.W. 1951. The waterfowl of a cat-tail marsh in central Maine. M.S. Thesis. University of Maine. 99 pp.

Rabenold, K.N. 1978. Foraging strategies, diversity, and seasonality in bird communities of Appalachian spruce-fir forests. Ecol. Monogr. 48: 397-424.

Ramakka, J.M. 1971. Breeding season behavior of radio-equipped male woodcock. M.S. Thesis. University of Maine. 59 pp.

Reardon, J.D. 1950. Woodcock utilization of improved covers in eastern Maine. M.S. Thesis. University of Maine. 83 pp.

Reinecke, K.J. 1977. The importance of freshwater invertebrates and female energy reserves for black ducks breeding in Maine. PhD Dissertation. University of Maine. 113 pp.

Reinecke, K.J. 1979. Feeding ecology and development of juvenile black ducks in Maine. Auk 96: 737-745.

Reinecke, K.J. and R.B. Owen. 1980. Food use and nutrition of black ducks nesting in Maine. J. Wildl. Manage. 44:549-558.

Reinecke, K.J. and R.B. Owen, Jr. 1980. J. Wildl. Manage. 44(3): 549-558.

Reinecke, K.J., T.L.Stone, and R.B. Owen, Jr. 1982. Seasonal carcass composition and energy balance of female black ducks in Maine. Condor 84(4):420-426.

Ringleman, J.K. 1980. The breeding ecology of the black duck in south-central Maine. PhD Dissertation. University of Maine. 88

Ringleman, J.K. and J.R. Longcore. 1982a. Survival of juvenile black ducks during brood rearing. J. Wildl. Manage. 46(3): 622-628.

Ringleman, J.K. and J.R. Longcore. 1982b. Movements and wetland selection by brood rearing black ducks. J. Wildl. Manage. 46(3):615-621.

Ringleman, J.K., J.R. Longcore, and R.B. Owen, Jr. 1982a. Breeding habitat selection and home range of radio marked black ducks in Maine. Can. J. Zool. 60(2):241-248.

Ringleman, J.K., J.R. Longcore, and R.B. Owen, Jr. 1982b. Nest and brood attentiveness in female black ducks.Condor 84(1): 110-116.

Robbins, C.S.,Jr. 1960. Birds of Sugar Island, Moosehead Lake, Maine. Maine Audubon Soc. Bull. 16(2): 30-34.

Root, O.M. 1952. Franklin County bird notes. Maine Audubon Soc. Bull. 7(4):85-86.

Rushmore, F.M. 1973. Techniques for calling sapsuckers and finding their nesting territories. U.S. Forest Service Research Paper Ne-281.

Sarbello, W. 1973. Renesting of the American eider in Penobscot Bay, Maine, colonies. M.S. Thesis. University of Maine. 67 pp.

Schemnitz, S.D. 1970. Fall and winter feeding activities and behavior of ruffed grouse in Maine. Trans. Northeast. Fish and Wildl. Conf. 27:127-140.

Schreiber, R.W. 1968. Seasonal population fluctuations of herring gulls in central Maine. Bird-banding 39(2): 81-104.

Schroeder, R.L. 1982. Habitat suitability models : yellow warbler. FWS/OBS-82/10.27. U.S. Fish and Wildl. Serv., Ft. Collins, CO. 7pp.

Schroeder, R.L. 1982. Habitat suitability models : black-capped chickadee. FWS/OBS-82/10.37. U.S. Fish and Wildl. Serv., Ft. Collins, CO. 12 pp.

Schroeder, R.L. 1982. Habitat suitability models : downy woodpecker. FWS/OBS-82/10.38. U.S. Fish and Wildl. Serv., Ft. Collins, CO. 10 pp.

Schroeder, R.L. 1982. Habitat suitability models : pileated woodpecker. FWS/OBS-82/10.39. U.S. Fish and Wildl. Serv., Ft. Collins, CO. 10 pp.

Sepik, G.F., R.B. Owen, and M.W. Coulter. 1981. A landowner's guide to woodcock management in the Northeast. Misc. Rep. 253.

Life Sci. and Agric. Exp. Stn., Univ. of Maine, Orono.

Shaub, M.S. 1957. Evening grosbeak records in the Maritimes, New England, and New York, summer of 1958. Maine Audubon Soc. Bull. 15(4): 102-106.

Short, H.L. 1985. Habitat suitability models: red-winged blackbird. Biol. Rep. 82 (10.95). Fish and Wildl. Serv., Ft. Collins, CO. 10 pp.

Smith, B.E. 1949. First nest record of the green-winged teal for Maine. Maine Audubon Soc. Bull. 5(1): 10.

Smith, B.E. 1949. White-winged crossbills nesting in Maine. Maine Audubon Soc. Bull. 5(1):12.

Sousa, P.J. 1982. Habitat suitability index models: veery. FWS/OBS-82/10.22. U.S. Fish and Wildl. Serv., Ft. Collins, CO. 12 pp.

Sousa, P.J. 1983. Habitat suitability index models: field sparrow. FWS/OBS-82/10.62. U.S. Fish and Wildl. Serv., Ft. Collins, CO. 14 pp.

Sousa, P.J. and A.H. Farmer. 1983. Habitat suitability index models: wood duck. FWS/OBS-82/10.43. U.S. Fish and Wildl. Serv., Ft. Collins, CO. 27 pp.

Spencer, H.S. 1974. Waterfowl population investigations 1973. Fifth annual report. Vol. 1. Maine Yankee Atomic Power Co. Augusta.

Spencer, H.S. 1975. Wild duck management plan for Maine, 1975-1990. Maine Department of Inland Fisheries and Wildlife, Augusta.

Squires, N.A. 1952. The birds of New Brunswick. The New Brunswick Museum, St. John, N.B. 164 pp.

Stewart, R.E. and J.W. Aldrich. 1951. Removal and repopulation of breeding birds in a spruce-fir forest community. Auk 68:471-482.

Stewart, R.E. and J.W. Aldrich. 1952. Ecological studies of breeding bird populations in northern Maine. Ecology 33:266-268.

Stott, R.S. 1973. Food-habit relationships of sea ducks on the New Hampshire coastline. Ecology 54(5):996-1007.

Taber, W. 1951. Nesting of the American three-toed woodpecker. Bull. Maine Audubon Soc. 7:29-32.

Taber, W. 1952. Altitudinal records. Maine Audubon Soc. Bull. 7(4): 74-84.

Taber, W. 1960. The mourning warbler. Maine Audubon Soc. Bull. 16(3): 50-51.

Titterington, R.W. 1977. The utilization of northern Maine clearcuts by nesting and wintering birds. M.S. Thesis. University of Maine. 62 pp.

Titterington, R.W., H. Crawford, and B.N. Burgason. 1979. Songbird responses to commercial clearcutting in Maine spruce-fir forests. J. Wildl. Manage. 43:602-609.

Todd, C.S. 1979. The ecology of the bald eagle in Maine. M.S. Thesis. University of Maine. 91 pp.

Todd, C.S. 1981. Bald eagle management plan. Maine Department of Inland Fisheries and Wildlife, Augusta.

Todd, C.S. and R.B. Owen, Jr. 1979. The ecology of the bald eagle in Maine. Maine Department of Inland Fisheries and Wildlife, Augusta.

Todd, C.S., L.S. Young, R.B. Owen, Jr., and F.J. Gramlich. 1982. Food habits of bald eagles in Maine. J. Wildl. Manage. 46(3):636-645.

Townsend, W.C. n.d. Field guide to pelagic birds in the Gulf of Maine. Mimeo. Sorrento, Maine. 10 pp.

Tribou, B. 1951. nesting of the long-billed marsh wren. maine Audubon Soc. Bull.:7(1):10.

Tyler, H.R. 1977. Wading birds in Maine and their relevance to the Critical Areas Program: great blue heron, black-crowned night heron, little blue heron, snowy egret, and glossy ibis. Planning report No. 26. Critical Areas Program, Maine State Planning Office, Augusta.

Tyler, H.R. 1975. Common terns, arctic terns, and roseate terns in Maine. Critical Areas Program, Maine State Planning Office, Augusta.

Vickery, P.D. 1980. Territorial Louisiana waterthrushes in western Maine. Maine Bird Life 2(2): 19-20.

Vickery, P.D. 1978. Annotated checklist of Maine birds. Maine Audubon Society, Falmouth, ME. 20 pp.

Vickery, P.D. and J. Despres. 1984. Checklist of the birds of Maine. Maine Bird Life 5(5): 54-61.

Wakeley, J.S. 1973. An analysis of banding and recovery data for the American eider. M.S. Thesis. University of Maine. 91 pp.

Wakeley, J.S. and H.L. Mendall. 1976. Migrational homing and survival of adult female eiders in Maine. J. Wildl. Manage. 40(1): 15-21.

Weeden, R.B. 1955. Cover requirements of breeding woodcock in central Maine. M.S. Thesis. University of Maine. 107 pp.

Westfall, C.Z. 1954. A study of woodcock behavior on their

breeding grounds in central Maine. M.S. Thesis. University of Maine. 117 pp.

Wiemeyer, S.N., A.A. Belisle, and F.J. Gramlich. 1978. Organochlorine residues in potential food items of Maine bald eagles, 1966 and 1974. Bull. Environ. Contam. Toxicol. 19:64-72.

Wooley, J.B. 1976. Energy expenditure of the black duck under controlled and free-living conditions. M.S. Thesis. University of Maine. 106 pp.

Wooley, J.B. and R.B. Owen, Jr. 1978. Energy costs of activity and daily energy expenditure in the black duck. J. Wildl. Manage. 42:739-745.

Appendix D. An Example of Applying the Atlas to a Land Management Decision

The information in the atlas can and should be used to plan land use activities in an environmentally sound manner. The data compilations in Table 3 in particular provide a tool for doing this. They may be used help answer questions such as the following: Which of two alternate sites would be the better place to situate a particular road, timber harvesting operation, house lot, land fill, nature trail, or other facility? Which lake level or timber cutting cycle would be best? Which tract of land is more important to acquire for conservation purposes? Which species should our town conservation group strive to manage? What birds have been found in the area where we live?

An example follows. It involves a major office complex, but it could just as easily involve any other sort of proposed development or conservation project. Atlas information can be applied to any situation requiring a choice between alternate, developable sites or alternate practices that will potentially affect wildlife.

A Hypothetical Case History

Developer Doe is applying to Maine DEP and the U.S. Army Corps of Engineers for permits that will allow the construction of a major office complex on mixed forest and wetland soils in central Maine. Personnel from these agencies and members of the local Planning Board have requested that the developer a) identify whether any species occurring on or in the vicinity of the site are of concern because of their rarity, b) consider and discuss the potential ecological impacts of siting the complex instead on a specified tract of land nearby, and c) compare the overall value of the two areas for wildlife.

A brief field visit and review of state resource files reveals no obviously significant differences between the proposed site and the alternate. How might atlas data be used, along with many other ecological, social, and economic factors, in helping decide which site is preferable?

1.To determine which block the sites are in and thus which block lists to consult, the user refers to the index maps in Figure 3. Then, to consult the block list, the user turns to Appendix D. This indicates which species have been found, but only in the general vicinity of the site (within approximately 8 miles). Species marked with an asterisk in Appendix D are potentially of concern because their range includes less than 20 percent of Maine. However, the user keeps in mind that this list is not comprehensive or current, and that not all the species listed will necessarily be present on the lands in question.

Thus, the next step is to describe what species inhabit the proposed sites. To determine this, the user contacts a trained ornithologist (colleges, consulting firms, and members of the atlas committee are possible avenues of contact) who visits both

sites. An equivalent effort is spent at both sites, and they are visited at least 3 times between late May and mid-July (the breeding season). These visits result in the following qualitative data:
Site A: American Robin, Veery, Red-winged Blackbird, Swamp Sparrow, Yellow Warbler, Hermit Thrush, Tree Swallow.
Site B: American Robin, Ruffed Grouse, Blue Jay, Downy Woodpecker, Gray Catbird, Marsh Wren.

(Actual lists would be many times longer).

3. Back at the office, these field lists are compared with the data in Table 3 for the appropriate region of the state (wildlife management unit, or WMU). The first question to be answered is, "Are any of the species found on the sites absent from the Table 3 list for this region, or are any of the sites' species given an asterisk in Appendix D , indicating general rarity? If so, the species are noted.

4. Next, numbers in the 2nd column of this table are transferred to the corresponding species lists for the sites, are totalled, and an average calculated for each site.

SITE A		SITE B	
American Robin	100	American Robin	100
Veery	92	Ruffed Grouse	92
Red-winged Blackbird	100	Blue Jay	100
Swamp Sparrow	77	Downy Woodpecker	96
Yellow Warbler	82	Gray Catbird	100
Hermit Thrush	96	Marsh Wren	40
Tree Swallow	100	TOTAL=	528
TOTAL=	647	AVERAGE=	88
AVERAGE=	92		

5. The site with the greater overall uniqueness is the one with the lower average. To preserve regional diversity, the developer builds on the site whose avifauna is comprised mainly of species which are widespread throughout the region, i.e., the site with the greater average. Note that areas which are more diverse (i.e., have more species) are not necessarily more important or lower-scoring, if the species they host are widespread.

6. Naturally, other considerations enter in. Sites which should be preserved or ecologically managed are those which a) have a greater number of species with very restricted ranges (as identified in Step 3), or which are declining generally throughout their range, b) have a greater number of species sensitive to the particular type of development or proposed activity, c) are relatively stable with respect to plant community succession and other factors that would drastically change their present avifauna, d) are sensitive to disturbance from this development because suitable buffer or refuge habitat is not available nearby, e) have more individual birds per unit area, and f) have these characteristics at all seasons, not simply during the breeding season. To determine (b) through (f), data not available from this atlas must be generated. Nonetheless, the atlas provides a beginning data set and a rapid assessment procedure where previously there was none, for

analyzing the tradeoffs among species and comparing the value of the two sites for regional wildlife diversity.

7. The above procedure has other applications. By substituting "Plan A" for "Site A" and "Plan B" for "Site B", the tradeoffs inherent in a choice among agency policies, timber or crop management plans, or other activities are elucidated. Such an analysis requires first predicting which species would occur under various scenarios. For this, professional assistance would be required.

Appendix E. Block List Matrix

In the matrix that follows, column headings are the numbered atlas blocks as shown in Figures 3 and 4. Gaps in some columns indicate blocks that received no coverage. Row headings are species abbreviations, a key to which is on the next page. Species marked with an asterisk are those whose range includes less than 20 percent of the state. Coded entries are:

3 = confirmed (C)
2 = probable (Pr)
1 = possible (Po)

A tabulation of these categories by block is given at the end of the Appendix.

Abbreviations for Bird Names

ABDU	American Black Duck
ALFL	Alder Flycatcher
AMBI	American Bittern
AMCO*	American Coot
AMCR	American Crow
AMGO	American Goldfinch
AMKE	American Kestrel
AMRE	American Redstart
AMRO	American Robin
AMWI*	American Wigeon
AMWO	American Woodcock
ARTE*	Arctic Tern
ATPU*	Atlantic Puffin
BAEA	Bald Eagle
BAOW	Barred Owl
BASW	Bank Swallow
BASW	Barn Swallow
BAWW	Black-and-White Warbler
BBCU	Black-billed Cuckoo
BBWA	Bay-breasted Warbler
BBWO	Black-backed Woodpecker
BCCH	Black-capped Chickadee
BCNH*	Black-crowned Night Heron
BEKI	Belted Kingfisher
BGGN*	Blue-gray Gnatcatcher
BHCO	Brown-headed Cowbird
BLGU*	Black Guillemot
BLJA	Blue Jay
BLTE*	Black Tern
BLWA	Blackburnian Warbler
BOBO	Bobolink
BOCH	Boreal Chickadee
BOGU*	Bonaparte's Gull
BPWA*	Blackpoll Warbler
BRCR	Brown Creeper
BRTH	Brown Thrasher
BTBW	Black-thr. Blue Warbler
BTGW	Black-thr. Green Warbler
BWHA	Broad-winged Hawk
BWTE	Blue-winged Teal
BWWA*	Blue-winged Warbler
CAEG*	Cattle Egret
CAGO	Canada Goose
CAWA	Canada Warbler
CEWA	Cedar Waxwing
CHSP	Chipping Sparrow
CHSW	Chimney Swift
CLSW	Cliff Swallow
CMWA	Cape May Warbler
COEI*	Common Eider
COGO	Common Goldeneye
COGR	Common Grackle
COHA*	Cooper's Hawk
COLO	Common Loon
COME	Common Merganser
COMO*	Common Moorhen
CONI	Common Nighthawk
CORA	Common Raven
COSN	Common Snipe
COTE	Common Tern
COYE	Common Yellowthroat
CSWA	Chestnut-sided Warbler
DCCO	Dbl-crested Cormorant
DEJU	Dark-eyed Junco
DOWO	Downy Woodpecker
EABL	Eastern Bluebird
EAKI	Eastern Kingbird
EAME	Eastern Meadowlark
EAPH	Eastern Phoebe
EUST	European Starling
EVGR	Evening Grosbeak
EWPE	Eastern Wood Pewee
FISP	Field Sparrow
FOSP*	Fox Sparrow
GADW*	Gadwall
GBBG	Great Black-backed Gull
GBHE	Great Blue Heron
GCFL	Great Crested Flycatcher
GCKI	Golden-crowned Kinglet
GCTH*	Gray-cheeked Thrush
GHOW	Great-horned Owl
GLIB*	Glossy Ibis
GRCA	Grey Catbird
GRCO*	Great Coromorant
GRHE	Green-backed Heron
GRJA	Grey Jay
GRSP*	Grasshopper Sparrow
GWTE	Green-winged Teal
HAWO	Hairy Woodpecker
HEGU	Herring Gull
HETH	Hermit Thrush
HOFI	House Finch
HOLA*	Horned Lark
HOME	Hooded Merganser
HOSP	House Sparrow
HOWR	House Wren
INBU	Indigo Bunting
KILL	Killdeer

(continued)

LAGU*	Laughing Gull
LBHE*	Little Blue Heron
LEBI*	Least Bittern
LEFL	Least Flycatcher
LEOW*	Long-eared Owl
LETE*	Least Tern
LISP	Lincoln's Sparrow
LOWA*	Louisiana Waterthrush
LSPE*	Leach's Storm-Petrel
MALL	Mallard
MAWA	Magnolia Warbler
MAWR	Marsh Wren
MODO	Mourning Dove
MOWA	Mourning Warbler
NAWA	Nashville Warbler
NOCA	Northern Cardinal
NOFL	Northern Flicker
NOGO	Northern Goshawk
NOHA	Northern Harrier
NOMO	Mockingbird
NOOR	Northern Oriole
NOPA	Northern Parula
NOSH*	Northern Shoveler
NOWA	Northern Waterthrush
NRWS	N. Rough-winged Swallow
NSWO*	Northern Saw-whet Owl
OROR*	Orchard Oriole
OSFL	Olive-sided Flycatcher
OSPR	Osprey
OVEN	Ovenbird
PAWA	Palm Warbler
PBGR*	Pied-billed Grebe
PHVI*	Philadelphia Vireo
PIGR*	Pine Grosbeak
PIPL*	Piping Plover
PISI	Pine Siskin
PIWA	Pine Warbler
PIWO	Pileated Woodpecker
PRWA*	Prairie Warbler
PUFI	Purple Finch
PUMA*	Purple Martin
RAZO*	Razorbill
RBGR	Rose-breasted Grosbeak
RBGU*	Ring-billed Gull
RBME*	Red-breasted Merganser
RBNU	Red-breasted Nuthatch
RCKI	Ruby-crowned Kinglet
RECR*	Red Crossbill
REVI	Red-eyed Vireo
RNDU	Ring-necked Duck
RNPH*	Ring-necked Pheasant
RODO	Rock Dove
ROTE*	Roseate Tern
RSHA	Red-shouldered Hawk
RSTO	Rufous-sided Towhee
RTHA	Red-tailed Hawk
RTHU	Ruby-throated Hummingbird
RUBL*	Rusty Blackbird
RUGR	Ruffed Grouse
RWBB	Red-winged Blackbird
SASP	Savannah Sparrow
SCTA	Scarlet Tanager
SNEG*	Snowy Egret
SORA*	Sora
SOSP	Song Sparrow
SOVI	Solitary Vireo
SPGR	Spruce Grouse
SPSA	Spotted Sandpiper
SSHA	Sharp-shinned Hawk
STSP*	Sharp-tailed Sparrow
SWSP	Swamp Sparrow
SWTH	Swainson's Thrush
TEWA	Tennessee Warbler
TRHE*	Tricolored Heron
TRSW	Tree Swallow
TTWO*	Three-toed Woodpecker
TUTI*	Tufted Titmouse
TUVU*	Turkey Vulture
UPSA*	Upland Sandpiper
VARA*	Virginia Rail
VEER	Veery
VESP	Vesper Sparrow
WAPI*	Water Pipit
WAVI	Warbling Vireo
WBNU	White-breasted Nuthatch
WHIP	Whip-poor-will
WIFL*	Willow Flycatcher
WILL*	Willet
WITU*	Wild Turkey
WIWA	Wilson's Warbler
WIWR	Winter Wren
WODU	Wood Duck
WOTH	Wood Thrush
WTSP	White-throated Sparrow
WWCR*	White-winged Crossbill
YBCU	Yellow-billed Cuckoo
YBFL	Yellow-bellied Flycatcher
YBSS	Yellow-bellied Sapsucker
YEWA	Yellow Warbler
YRWA	Yellow-rumped Warbler
YTVI*	Yellow-throated Vireo

Appendix E (continued)

	000	001	002	003	004	005	006	007	008	009	09A	09B	010	011	012	013	014	015
PBGR*																1		
CDLO																		
ATPU*																		
BLGU*	3																	3
RAZO*																		
GBBG	3	3	1								3						3	3
HEGU	3	3	1								3						3	3
LAGU*																		
RBGU*																		
BOGU*																		
COTE			1					1		3	3						3	3
ARTE*																		
ROTE*																	3	3
LETE*										3							3	
BLTE*																		
LSPE*																		
GRCO*																		
DCCO	3	3	1			1				1	3						1	3
COME																		
RBME*																		
HOME										3								
MALL	3	3	1	3	3			3		3	2				3	3		
ABDU	3	1		3	3	1		3		3	1				3	3	3	3
GADW*	1														1			
AMWI*																		
GWTE										1					1			
BWTE				2														
NOSH*																		
WODU				3				2								1		3
RNDU																		
COGO																		
COEI*	3		1			1					3						3	3
CAGO	3				1													
GLIB*	3															1	1	3
AMBI		2		2				2										
LEBI*																		
GBHE		1	1	3	1	1		2			3				1	1		1
SNEG*	3	1	1	1	1											1	1	3
TRHE*	1																	
LBHE*	3																	3
CAEG*																		
GRHE		1	1	3	3	1		2		3	2				1	2	3	1
BCNH*	3	3	1	1		1											1	3
VARA*		2		2				2	3								1	1
SORA*																		
COMO*																		
AMCO*																		
AMWO					2			2		3			2				3	1
COSN								2										
WILL*										3	3							1
UPSA*					1			1						2	3	3		
SPSA	3		1		1			2		3	2				2	3	3	3
KILL		1	1	3	3	1		3		3	3			1	3	3	3	3

	000	001	002	003	004	005	006	007	008	009	09A	09B	010	011	012	013	014	015
PIPL*										3							3	
SPGR																		
RUGR			1	1	2			2		3	3				3	3		
RNPH*			1		2	1		3		2					2			
WITU*		3	3	3	3	3		3	3	3				2	3	2	2	
RODO			1	3	3	1		3		3	3			1	1	3	3	3
MODO		1	2	2	3	1	1	3	1	3	3		1	1	3	3	3	3
TUVU*				1												1	1	
NOHA																		
SSHA								1							3		1	
COHA*			3		3									3				
NOGO				1	3			1					3	3		3		
RTHA		1		2	3			2								3		
RSHA				2						1				3	1	3	3	
BWHA			2	2	3		1	3		3			3		1	2	1	
BAEA															2			
AMKE			1	2	2	1		3		3	1			1	1	3	1	
OSPR				1											1	1		
LEDW*																		
BADW				1	1			2						3		2	3	
NSWO*								1		1								
GHDW			2							2	2					3		
YBCU		3	1	3	3			2		2						2	1	
BBCU			1	2	1			3		2					3	2	2	1
BEKI		1	1	3	1	1		3		3	1				1	3		2
HAWO		1		2	2		1	3		2	3			1	1	2	1	1
DOWO		1	2	2	3	1	1	3		3	3					3	3	1
BBWO																		
TTWO*																		
YBSS								2									1	1
PIWO			1					1		1								
NOFL			2	3	3	1	1	3		3	3				2	3	1	1
WHIP			2		1		1	2	1	3					1	2	2	
CONI		1	1	1			1							1			1	1
CHSW		1	1	3	3	1	1	3		3	3			1	2	3	1	
RTHU				1				2		1	1				3	1	1	1
EAKI	3	1	1	3	3	1	1	3	3	3	3		1	1	3	3	3	1
GCFL			2	2	3	1	2	2	3	3	3			1	2	3		1
EAPH		1	2	3	3	1	1	3	1	3	3		1	1	3	3	3	1
OSFL							1			1					1	2		
EWPE		1	1	2	3	1	1	2		3	3		1		2	3	2	2
YBFL																		
ALFL		2	2	2	2		1	2			1		1		3	2	3	
WIFL*		2	1	2				2										
LEFL		1		2	2		1	2					1	1	3			
HOLA*					1					3				2	1	2		
BLJA		1	3	3	3	1	1	3	2	3	3		1	1	1	3	3	3
GRJA																		
CORA					3													
AMCR		1	3	3	3	1	1	3	3	3	1		1	1	3	3	3	1
EUST	3	1	3	3	3	1	1	3		3	3		1	1	3	3	3	3
BOBO		2	1	2	3	1	1	3		3	2		1	2	3	3	3	1
BHCO		1	1	1	3	1	1	3		3	2		1	1	1	3	3	3

Appendix E (continued)

	000	001	002	003	004	005	006	007	008	009	09A	09B	010	011	012	013	014	015
RWBB	2	2	3	3	3	1	1	3	3	3	3		1	1	3	3	3	3
EAME		2	1	2	3			3		3				2	2	3	2	
DROR*															1			
NOOR		1	2	3	3	1	1	3	1	3	3			1	3	3	3	1
RUBL*																		
COGR	3	1	3	3	3	1	1	3		3	3		1		3			3
EVGR																		
PIGR*																		
PUFI			1	1	2	1	1	3		3	3			3	1	3	3	3
HOFI		1	3	3	3	1		3		3	3					3	3	3
RECR*																		
WWCR*																		
AMGO		1	2	2	3	1	1	3		3	3				2	3	3	3
PISI				2						1								
VESP			1				1	2						3	3	3	3	
SASP		1		1	2			2		3	3				1	2	1	3
GRSP*														3	1	3		
STSP*			2							3	2				2		1	
WTSP		2	1	2	2	1	1	2		2	2		1	1	3	2	2	
CHSP		1	1	3	3	1	1	3	1	3	3		1	1	1	3	3	
FISP			1	3	2		1	3		3	2		1	3	2	3	3	
DEJU					3	2		2							1			
SOSP	3		2	3	3	2	1	3	1	3	3		1	1	3	3		3
LISP																		
SWSP		2		3	2		1	2			1		1		2	2	3	
FOSP*																		
RSTO			3	3	3	2	1	3	1	3	3		1	2	2	3	3	1
NOCA	2		2	2	3	1		3		3	3				1	3	3	2
RBGR			2	2	2	1	1	3		2	3		1	2	2	3	3	3
INBU		1	1	3	2	1	1	3		3	1		1	2	3	3	3	
SCTA			2	2	2	1	1	2	1	2	1		1	1	3	3	1	
PUMA*							1	3	3	3					3	3		
CLSW				3	3	1		3	3	3	3					3		3
BASW	3	1	3	3	3	1	1	3	3	3	3		1	1	3	3	3	3
TRSW	3	1	3	3	3	1	1	3	3	3	3		1	1	3	3	3	3
BASW			1		3			3		3	3				3	3	3	3
NRWS				3							3				3			
CEWA		1	2	2	3	1	1	3		3	3		1	1	1	3	3	1
REVI		2	2	3	3	3	1	3	1	3	2		1	1	3	3	3	3
PHVI*																3		
WAVI		1	1	2	2		1	2		3			1		2	1	3	
YTVI*								2										
SOVI					2	2	1	3	1	2			1			2		2
BAWW			2	1	2	1	1	2	1	3	3		1	1	3	2	3	1
BWWA*				3														
NAWA			1	1	3		1	3		3				1	3	3	1	
TEWA																		
NOPA					2	2		2		2	2		1		1			
CMWA																		
YEWA	2	2	2	3	3	1	1	3		3	3		1	1	2	3	3	3
BTBW					1			2		2			1		1	2		
YRWA			1		2		1	2		3	2		1		1	1		1
MAWA										2					1			

	000	001	002	003	004	005	006	007	008	009	09A	09B	010	011	012	013	014	015
CSWA			2	2	3	1	1	3		3	1		1	1	2	3	3	
BBWA																		
BPWA*																		
BLWA			1							1			1					
BTGW			2		3	1	1	3		3			1	1	1	3		2
PIWA			2	2	2		1	2		3			1		2	2		
PAWA																		
PRWA*				3	3		1	3		3			1	2	2	3	3	
OVEN		2	2	2	3	2	1	3	2	3	3		1	1		2	2	
NOWA				2	2		1	2					1	1	2	2		
LOWA*										3								
MOWA																		
COYE	3	3	3	3	3	1	1	3	1	3	3		1	1	3	3	3	3
WIWA																		
CAWA			1		2		1	2		3	3		1	1	1	1	3	
AMRE	2	1	2	2	3	1	1	3	1	3	1		1	1	2	3	3	1
HOSP		1	3	3	3	1	1	3	1	3	3			1	1	3	3	3
WAPI*																		
NOMO	3	1	2	3	3	1	1	3		3	3				3	3	3	3
GRCA	3	1	2	2	3	1	1	3	1	3	3		1	1	3	3	3	3
BRTH			3	2	2	1	1	2		3	3		1	1	3	3	3	1
HOWR		1	2	3	3	1	3	3	3		1		1	1	3	3	3	3
WIWR													1					
MAWR																		
BRCR			1		1		1	1		3						2		
WBNU		1	1	1	2	1	1	3		3						2		2
RBNU			1					2		3						1		1
TUTI*			3	1	3						3							
BCCH		1	3	3	3	1	1	3		3	3		1	1	3	3	3	3
BOCH																		
GCKI																		
RCKI																		
BGGN*					1													
WOTH		1	2	2	3	3	1	3	1	3	3		1	1	3	2	3	
VEER			2	2	2	1	1	2		3	1		1	1	3	2		
GCTH*																		
SWTH																		
HETH					2		1			3			1		2	1		
AMRO		1	2	3	3	3	1	3	2	3	3		1	1	3	3	3	3
EABL					1			3	3	3				3	3	1	1	

Appendix E (continued)

	016	017	018	019	020	021	022	023	024	025	026	027	028	029	030	031	032	033
PBGR*							3											
COLO	3	3	1							3	2							3
ATPU*																		
BLGU*						1								3	3	3	3	
RAZO*																		
GBBG						3								3	3	3	3	
HEGU						3							3	3	3	3	3	
LAGU*																		
RBGU*																		
BOGU*																		
COTE						3								3	3	3	3	
ARTE*						3											3	
ROTE*						3											3	
LETE*						3											3	
BLTE*																		
LSPE*																		
GRCU*																		
OCCO						3						1		3	3	3	3	
COME																		
RBME*														3			3	
HOME			3															
MALL		1		1	3	3	2					3	1	3			1	3
ABDU				2	3	3	2						3	3	3		3	3
GADW*					1	1												
AMWI*																		
GWTE					3													
BWTE						1	1											
NOSH*																		
WOOD			3	3		3	2				3	1						1
RNDU			3															
COGO																		
CDEI*						3	3							3	3	3	3	
CAGO					2	3												
GLIB*						3												
AMBI		1			1	1	2					1					1	
LEBI*																		
GBHE				1	1	1							1	3		3	1	1
SNEG*						3										3	1	
TRHE*						3												
LBHE*						3												
CAEG*						3												
GRHE					1	3	2						3	1			3	2
BCNH*						3									3	3	1	
VARA*						3											3	
SORA*						3												
COMO*						1												
AMCO*																		
AMWO				2		1	3						2	2	3		3	1
COSN				2		1												
WILL*					3	3											1	
UPSA*	3	1										1	1					
SPSA		1		1	3	3	3						3		3		3	1
KILL	1	3	1	3	2	3	3		1			3	2	3		1	1	2

	016	017	018	019	020	021	022	023	024	025	026	027	028	029	030	031	032	033
PIPL*						3											3	
SPGR																		
RUGR				2	1		3			3		1	3				3	3
RNPH*							3					1	3	2	1	3		
WITU*		1	2	1														
RODO	1	1	1	3	3	1	3					3	3	3		3	1	3
MODO	3	3	1	2	3	3	3		1	1		3	3	3		3	2	3
TUVU*		1		1	1						1							1
NOHA					1	1	1					1					1	1
SSHA			1	3													1	
COHA*		3		3	3												1	
NOGO				3	3						3	3						
RTHA		1			1		1											1
RSHA		3		3		3							1	1				2
BWHA		1		3	1								1	2			2	3
BAEA																		
AMKE	2	2		3	2	2	1	3				3	3	3			3	3
OSPR				2										3		3	3	1
LEOW*				1									1					
BAOW				3			2				3			1			2	1
NSWO*				3													2	
GHOW				3	3	3	3						1	1	3		2	3
YBCU		2	1	1	1		2						1	2			1	
BBCU		2	1	2	1		2						3	2			2	2
BEKI		1		1	2	2	1					1	2	3		1	3	3
HAWO		1		2	1	1	3					1	3	3		1	3	3
DOWO	1	3	1	2	2	3	3		1				1	3		3	3	3
BBWO																		
TTWO*																		
YBSS		3		1									1			1		3
PIWO	3		1	1									2	2				2
NOFL	1	3	1	2	1	2	3					1	3	3		3	3	3
WHIP				2		2	1							2			2	2
CONI				1						1			1	1				
CHSW	1	2	1	3	1	1	1		1		1	1	1	1			3	3
RTHU		1		1			1						3	2			1	2
EAKI	2	3	1	3	3	2	3	1	1		1	1	3	1		1	3	3
GCFL	1	2	1	2	1	2	3			1			2	2		1	2	2
EAPH	1	3	1	3	1	2	2		1	3		1	3	3		2	3	3
OSFL					1					2				3		3	3	3
EWPE	1	3	1	2	1	2	2						2	3			2	3
YBFL																		
ALFL		1	1	2		2	2											2
WIFL*						3												
LEFL	1	2	1	2	1				1		1		1				2	2
HOLA*																		
BLJA	1	3	1	2	3	3	3	3			1	3	3	3		3	3	3
GRJA																		1
CORA			1					1									3	3
AMCR	1	3	1	3	2	2	3			1	1	3	3	3		2	3	3
EUST	1	3	1	3	3	3	3		1		1	3	3	3		3	3	3
BOHO		3	1	3	1	3	3		1		1	3	2	3				3
BHCO	1	1	1	1	3	3	3		1			3	3	3	3	3	3	3

Appendix E (continued)

	016	017	018	019	020	021	022	023	024	025	026	027	028	029	030	031	032	033
RWBB		3	1	3	3	3	3		1		1	3	3	3		2	3	3
EAME		1	1	2	3	3	3		1		1	2	2	1				
OROR*			1		1	1												
NOOR	1	1	1	3	3	3	3		1			2	3	3			3	3
RUBL*																		
COGR	1	3	1	3	3	3	3	3				3	3	3		3	3	3
EVGR																		1
PIGR*																		
PUFI	1	1	1	2	1	3	3	1		2			2	3	1	2	3	3
HOFI	1	1	1	1	3	3	3					1	3	3	1	3	3	
RECR*																		1
WWCR*																	2	
AMGO	1	3	1	2	2	3	3		1	1	1	1	3	3		1	2	3
PISI																		
VESP	2			2	1									1				1
SASP				1	3	3	3					1	3	3			3	1
GRSP*																		
STSP*					2	3	1										3	
WTSP	1	2	1	3			2	1		2			2	3		2	3	3
CHSP	1	3	1	2	2	3	2				1	3	2	2			3	3
FISP	3	3	1	2	1				1				3					3
DEJU										1							3	1
SOSP	1	3	1	3	3	3	3	2			1	3	3	3		3	3	3
LISP																		
SWSP		2		1	1	3	2							1		1	3	3
FOSP*																		
RSTO	1	3	1	3	1	3	3		1	2	1		3	3	3	1	3	3
NOCA				3	2	3	3					3	3	3	2	3	1	
RBGR	1	2	1	2	1		2			2	1		3	3		2	2	3
INBU		3	1	1			2					3	3			1	2	2
SCTA	1	3	1	2	1		1	1		2		2	2	1		1	3	3
PUMA*										1								3
CLSW		3	3	1	3	3	3					3		3		3	3	3
BASW	3	3	3	3	3	3	3				1	3	3	3		3	3	3
TRSW	1	3	1	3	3	3	3		1		1	3	3	3	3	3	3	3
BASW		3		3	1	1	3					1	3	3			3	3
NRWS		1		3	1	1								3				3
CEWA	1	2	1	3	1	3	3		1		1	1	3	3		2	3	3
REVI	1	3	1	3	2	3	2	2	1		1	1	2	3		2	3	3
PHVI*																		
WAVI	1	1	1	3					1		1		3					2
YTVI*	1	1	1	1			2											3
SOVI		2	1	2	1	3	1			1		2					2	3
BAWW	1	3	1	3	1	3	3		1	3		1	3	3		2	3	3
BWWA*																		
NAWA		1		2	1	2	2			1	1		2	2		1	3	3
TEWA																		
NOPA	1	1		1		3	2									1	3	1
CMWA																		
YEWA	1	3	1	3	3	3	3				1	1	3	3		3	3	3
BTBW		1		1		1				1				1		1		2
YRWA	1	3		1	1		2	1		1			2			2	3	3
MAWA		2		1	1		2					1	1	3		1	3	3

	016	017	018	019	020	021	022	023	024	025	026	027	028	029	030	031	032	033
CSWA	1	3	1	3	1	1	3		1	2	1	1	3	2		2	2	3
BBWA																		3
BPWA*																		
BLWA		1		2	3								2	1		1	3	1
BTGW			1	2	1	2	3			1			2	3		2	3	1
PIWA	2	2		1		1							2					3
PAWA					1													
PRWA*	1	1	1										3					
OVEN	1	2	1	1	2	2	2	1	1	3	1	3	2	2		2	3	2
NOWA			1	1	1				1				2			2		1
LOWA*																		1
MOWA																		1
COYE	1	3	1	3	3	3	3	1	1	3	1	2	3	3		2	3	3
WIWA																		
CAWA		1		2	1		2			2	1		2	1			3	3
AMRE	1	2	1	3	1	3	3		1		1		3	2		1	2	3
HOSP	1	3	1	3	3	3	3				1	3	3	3		3	1	3
WAPI*																		
NOMO	1	2	3	1	1	3	3					3	2	2		1		2
GRCA	1	3	1	2	3	3	3		1	1		3	3	3		2	3	3
BRTH	1	2	1	1	1	1	3				1	2	1	3		1	3	3
HOWR	1	3	1	3		3	3		1		2		2	2		1	2	3
WIWR								1					1			2	3	3
MAWR		2				3	3											
BRCR					1		2						1	1		1	3	2
WBNU		3	1	2	1	1	2						2	2		1		3
RBNU	1	2		1	1	3	2	2		2			1	2		3	3	3
TUTI*				3			3							3			1	
BCCH		3	1	3	2	3	3	1		2	1	3	3	3	3	3	3	3
BOCH																		
GCKI							2										3	
RCKI																	2	
BGGN*																		
WOTH	1	2	1	2	1		2	1		1		2	2	2		1		3
VEER	1	2	1	2	3	1	3	1		2		3	2	2				3
GCTH*																		
SWTH																	2	1
HETH	1	2	1	2	1		3	2		1			2			1	3	3
AMRO	1	3	1	3	3	3	3	2		1	1	3	3	3		3	3	3
EABL	1		1	3	3									3			3	3

Appendix E (continued)

	034	035	036	037	038	039	040	041	042	043	044	045	046	047	048	049	050	051
PBGR*					2	1								3				
COLO	2		1	1												3	3	3
ATPU*												3						
BLGU*								3	3			3	3					
RAZO*																		
GBBG							3	3	3	3		3	3					
HEGU						3	3	3	3	3		3	3				1	
LAGU*														1				
RBGU*								1			3	3						
BOGU*																		
COTE						3	3	3	3		3	3						
ARTE*									3			3						
ROTE*									3		3	3						
LETE*										3								
BLTE*																		
LSPE*												3						
GRCO*																		
DCCO							3	3	1	3		3	3					
COME																		
RBME*								1										
HOME														3	3			
MALL		3		3	2	1	1	3	3	3			3	3				1
ABDU			2		3	1	1	3	1	3		3	1	3	1	3	1	3
GADW*														1				
AMWI*																		
GWTE								1	3					1		3		
BWTE					3			1	3			3		3				
NOSH*																		
WODU	1		3	3	3		1	1	3		1			3		3		
RNDU											1			3				
COGD														3			1	
COEI*						3	3	3	3	3		3	3					
CAGO			3					1						1			3	
GLIB*																		
AMBI					2	1		3	3					1				
LEBI*					1				2									
GBHE	1				2	1	3	3	2	1			3	2	1			
SNEG*								3	1	1								
TRHE*																		
LBHE*																		
CAEG*																		
GRHE					2	1	1	3		3			2					
BCNH*						1		3		1				1			1	
VARA*					2				1									
SORA*					2								1					
COMO*									2									
AMCO*																		
AMWO	3				3	3	2	3		1		2	2	2				2
COSN					2	2		1				3		2				
WILL*																		
UPSA*								1										
SPSA						1		3		3		3	3	3	1			
KILL	1				3	3	2	3	2	3		3		2			3	1

	034	035	036	037	038	039	040	041	042	043	044	045	046	047	048	049	050	051
PIPL*																		
SPGR																		
RUGR					3	2		3	2	3		3		3		3		1
RNPH*	1				2			2	2				3					1
WITU*																		
RODO		1			3	3	2	3	3	3				1	3		1	
MODO	1	2			3	3	3	3	3	3		3	1	3	1	1	3	1
TUVU*							1	1						1	1		1	
NOHA								1		1								
SSHA								3	1									
COHA*								2										
NOGO					2			2	2							3		
KTHA					1	1		1	1					1				
RSHA					3			3								2	1	
BWHA	1				3		3	3	2	1				1		1	2	
BAEA								1										
AMKE					3	3	1	3	1					3	3		1	2
OSPR						1	3	3	3	3	3	3						
LEOW*					3													
BADW					2	2	2	3	2									
NSWO*					1		1	3	2									
GHOW	1				2			3	3			2						
YBCU			1		2	3		2	2					3		1	2	
BBCU					3	3	2	3		1			3	2	1			
BEKI	1	1			2	2	2	3	3	2				3	3		2	
HAWO	1	1			3	3	3	3	2	2			1	2	1	1	3	1
DOWO	1				2	3	1	3	2	3		3	3	3	1	1	2	
BBWO																		
TTWO*																		
YBSS	1				1	1		1	2				1	3	1		3	
PIWO					3	1	3	3	2									1
NOFL	3		1		3	1	1	3	2	3		3	1	3	1	1	2	1
WHIP	2				2	2	2	3	2	1				2	1			2
CONI					2	2		2	2					2	2			
CHSW	2	1			3	3	2	2	2	2		3		1	1		1	3
RTHU	2				3	1	1	1	2	3			3	2	1	1		1
EAKI	2	3			3	3	2	3	2	3		3	1	3	3	1	3	3
GCFL		1			3	3	3	3		2				3	1		2	
EAPH	3	2			3	3	3	3		3		3	3	3	3	3	3	3
OSFL								3	2	1			1					
EWPE	1	3	1		2	2	2	3					1	3	1	1	2	
YBFL																		
ALFL					2	2	1	2			1			1	1		2	
WIFL*						2		1						3				
LEFL	1				2	2	1	1		1			1	2	1		2	
HOLA*																		
RDJA	3	2	1		3	3	3	3	2	3		3	3	3	3		3	1
GRJA																		
CORA					1		1	2	2				2	3	1			
AMCR	1	3			3	3	3	3	3	3		3	3	3	3	1	3	
EUST	3	1			3	3	3	3	3	3		3	3	3	3	3	3	1
BOBO	2	1			3	3	2	3				3	2	1	1	1	1	2
BHCO	1	3			3	3	2	3	2	3		3	1	3		3	3	1

	034	035	036	037	038	039	040	041	042	043	044	045	046	047	048	049	050	051
RWBB	2	2		1	3	3	3	3	3	3		3	3	3	3		3	2
EAME					3	3	2	3									2	2
OROR*								1										
NOOR	3	3			3	3	3	3		3			1	3	3	2	2	2
RUBL*																		
CDGR	1	3			3	3	3	3	2	3		3	3	3	3		3	
EVGR	1												1					
PIGR*																		
PUFI	1				3	3	2	3		3		3	3	1		3	2	
HOFI						3	3	3	2	3			1					
RECR*								1			3							
WWCR*								1	3				3					
AMGO	2	1			3	3	3	3	2	3		3	1	2	1	2	2	
PISI					1			3	2	3			1					
VESP					1													
SASP					2	2		3				3	3					
GRSP*																		
STSP*								3										
WTSP		3			3	3	2	3	3	2		3	3	3	1	1	3	
CHSP	1	3			3	3	3	3	2	3			3	3	3	1	3	3
FISP	2				3	2	1							1	1		1	
DEJU						1		3		3		3	3				2	
SOSP	2	3			3	3	3	3	3	3		3	3	3	3		2	2
LISP																		
SWSP					3	3		3				2	1	3	3		2	
FOSP*																		
RSTO	2	3			3	2	3	3	2	3		3	1	3	1	1	2	1
NOCA						3	3	3	2	3	2	3	3					
RBGR	1	1			3	3	2	3		3		3	1	3	3		2	
INBU	1				3	3	2	3							3		2	
SCTA	1	1			3	2		3	2					1	1	1	2	
PUMA*														3	1			
CLSW					3	3	3	3	3	3	3	3	3	1	3		3	
BASW	3	1		1	3	3	3	3	3	3		3	3	3	3	3	3	2
TRSW	3	1		1	3	3	3	3	3	3		3	3	3	3	3	3	3
BASW	3				2	3		3	3	3	3			3	3		3	
NRWS					2	2				3							1	
CEWA	3	1			3	3	3	3	3	3		3	3	3	1	1	3	
REVI	2	2			3	3	3	3		3		3	1	3	3	1	3	
PHVI*																		
WAVI					2	3	2						1	3	1		2	
YTVI*						2								3	1		3	
SOVI					2			3	2					3	1		1	
BAWW	1	1			2	2	2	3	2	2		3	2	3	3		2	
BWWA*																		
NAWA					3	2	1	3		2				1	3		2	
TEWA																		
NOPA								2	2	3			3				1	
CMWA																		
YEWA	1	1	1		3	3	2	3	2	3		3	3	3	3	1	3	
BTBW								3	2						1		2	
YRWA	1	3			1		2	3	2	3			1	3	1	1	2	
MAWA						2	3	3		1			2	1			1	

	034	035	036	037	038	039	040	041	042	043	044	045	046	047	048	049	050	051
CSWA	1	2	2		3	3	3	3	2	2		3	1	3	3		2	
BBWA																		
BPWA*																		
BLWA					1	2	2	3					1	2			2	
BTGW					2	2	2	3	2	2		3	3				2	
PIWA	1	1			2	3	1	3						3	1		2	
PAWA																		
PRWA*					3													
OVEN	3	2			3	2	2	3	2	2		3	1	2	3	1	2	
NOWA					3	3	2	1					1	3			2	
LOWA*														1	2			
MOWA																		
COYE	2	2	2	1	3	3	3	3	3	3		3	3	3	3	1	3	3
WIWA													1					
CAWA					3	2		3					1	2	2		2	
AMRE	2				3	3	2	3	2	3		3	1	3	3	1	2	
HOSP					3	3	3	3	2	3		3		1	1	3	3	
WAPI*																		
NOMO		1			3	2	3	3		2			3	1				1
GRCA	3	1			3	3	3	3	2	3		3	3	3	3		3	1
BRTH	3				2	2		3	2	1		3	2	1	1	1	1	2
HOWR	3				2	2	3	3						2	1		3	1
WIWR					1			2					3					
MAWR					3			3	2									
BRCR	1	1			1			3	2	1			1					
WBNU	1	2			3	2	2	3	2			3	1	2	3	1	3	1
RBNU	1	3	1		2	3	1	3	2	3		3	3	1	1		2	
TUTI*								1	2	2				2				
BCCH	3	3			3	3	3	3	3	3		3	3	3	3	2	3	1
BOCH																		
GCKI					2			3	3	2			3					
RCKI								2	3	2			1					
BGGN*						2								3				
WOTH	1				3	3	2	3		1		3		1	1	1	2	
VEER	1				3	2	2	3					1	2	1	1	2	
GCTH*																		
SWTH							2	3					3					
HETH					2		2	3		2			2	2	1		2	
AMRO	3	3	1		3	3	3	3	3	3		3	3	3	3	3	3	3
EABL	3						3	3					2			3	3	2

Appendix E (continued)

	052	053	054	055	056	057	058	059	060	061	062	063	064	065	066	067	068	069
PBGR*	1				1													
COLO	2				2			3						3	3	3	3	1
ATPU*																		
BLGU*								3	3	3	3							
RAZO*																		
GBBG							1	3	3	3	3							
HEGU				1	1	1	1	3	3	3	3							
LAGU*																		
RBGU*						1		3		3	3							
BOGU*																		
COTE								3		1	1							
ARTE*										3	3							
ROTE*																		
LETE*																		
BLTE*																		
LSPE*								3										
GRCO*																		
OCCO				1	1	1	1	3	3	3	3							
COME	3														2			
RBME*								3										
HOME		2				3	3	3									2	
MALL	3			1	3	1		3	3	3					3		1	3
ABDU	3	2	2	3	3	3	3		1						2		1	1
GADW*								3										
AMWI*																		
GWTE					2		3											
BWTE	2				2		3											
NOSH*																		
WOOD	1	2	2	1		3	3					1			1		3	3
RNDU					1	1												
COGO								3										
COEI*						3		3	3	3	3							
CAGO		3		1	1			3						3				
GLIB*																		
AMBI	1	2			3			2									1	3
LEBI*																		
GBHE	1	1	1	1	1	1	1	3	1		3				1	1	1	1
SNEG*						1												
TRHE*																		
LBHE*																		
CAEG*																		
GRHE	1	1		1	3	1											1	3
BCNH*				1				3	1	3	1							1
VARA*	2	2	1		3			3										
SORA*	2	1			3			3										3
COMO*			3															
AMCO*																		
AMWO	3	2	2	3	3	3			3						2		1	1
COSN	2	2		2	2											1		
WILL*																		
UPSA*				3														3
SPSA	1	2	3	2	2	1		3		3	2				3			1
KILL	3	3	3	3	3	3	1	3		3					3	1	3	3

	052	053	054	055	056	057	058	059	060	061	062	063	064	065	066	067	068	069
PIPL*																		
SPGR																		
RUGR	3	2		3	3	3		3	3	1	3				3		3	3
RNPH*	1			1											1		1	3
WITU*																		
RODO	1	3	3	3	3	1				1							3	3
MODO	3	3	2	3	3	2	1	3	3	1	2		3		2	1	2	3
TUVU*		1													2			
NOHA	1																	
SSHA				1	1	1				1					1			
COHA*								3										
NOGO	3	3			1													3
RTHA				1	1										1			
RSHA		2		1	1					3								1
BWHA		1	2	3	3	3	3	3		3					3		2	2
BAEA				3	3													
AMKE	3	3	3	3	3	3	3	3							1		3	3
OSPR		1		1	3	3	3	3	3	3	3	1			1			
LEOW*																		
BAOW				2	2	2									2		3	2
NSWO*		2		2	2			2										
GHOW	3	1		3	2	1		3		3					2			1
YBCU	2	2			2													
BBCU	2	2		3	2	2	1			1					1		2	3
BEKI	2	2	2	1	2	2		3	1	1	2				3		2	3
HAWO	3	2	1	3	3	3	1		3	1					3		2	3
DOWO	1	2	1	3	3	3		3	1	3	1				3	1	1	3
BBWO																		
TTWO*																		
YBSS	1	3		1	1										1		3	1
PIWO	3	2		1	1	3							2				2	3
NOFL	2	2	1	3	3	3	3	3	1	3	3				3	1	1	3
WHIP	2	2	2	2	2	2	1	3	2	2					2		2	2
CONI				2	1										2		1	1
CHSW	2	1	2	1	2	2	1		3						3		2	3
RTHU	1	1		1	2	3		3	1	1	2				2		1	2
EAKI	3	3	3	3	3	3	1	3		3					3	1	3	3
GCFL	3	2	1	3	3	3	1			2					2		3	2
EAPH	3	3	3	3	3	3	3	3		3			3		3	1	3	3
OSFL				2	1	1		2	2	2					2		2	
EWPE	2	2	2	3	3	3	1			2	1				3	1	2	1
YBFL																		
ALFL	2	2	3	3	3	1	1		2	3					2	1	2	2
WIFL*					2													
LEFL	2	2		3	2		1			1					2	1	2	1
HOLA*																	2	
BLJA	3	3	3	3	3	3	1	3	3	1	2				3		2	3
GRJA																		
CORA	1	1			1				1	1					1			
AMCR	3	3	3	3	3	3	1	3	1	1	3				3	1	3	3
EUST	3	3	3	3	3	3	3	3	3	3			3		3	1	3	3
BOHO	3	3	3	3	3	1	1	3	1	3					3	1	2	3
BHCO	2	3	2	3	3	3	1	3	3	1	3		3		2	1	2	3

Appendix E (continued)

	052	053	054	055	056	057	058	059	060	061	062	063	064	065	066	067	068	069
RWBB	2	3	3	3	3	3	1	3	2	3	2				3	1	2	3
EAME	2	3	3	3	3	1									1	1	2	3
OROR*			1															
NOOR	3	3	3	3	3	3	1	3		3					3		3	3
RUBL*																		
COGR	3	3	3	3	3	3	1		3	3	2				3	1	3	3
EVGR									3	1					1			
PIGR*																		
PUFI	2	2		3	3	3	1	3	1	3	2				3	1	2	2
HOFI	2		1	3	2		1		2	3					1			3
RECR*				1											1			
WWCR*									2									
AMGO	3	2	2	3	3	3	1	3	3	2	2				3	1	3	3
PISI	1					3		3	3	1								
VESP	3	2															3	
SASP		2	3	3	3	2				3					1	1	2	3
GRSP*																		
STSP*										1								
WTSP	2	2	2	3	3	3	1	3	3	3	3				3	1	2	2
CHSP	2	2	3	3	3	3	3	3	3	3			3		3	1	3	3
FISP	3	2	2	3	1										2		2	2
DEJU		2				3		3	3	3	3		3		1	1		
SOSP	3	3	3	3	3	3	1	3	3	3	3				3	1	2	3
LISP																		
SWSP	3	2	1	3	3			3	3	2					3		1	2
FOSP*																		
RSTO	3	2	2	3	3	3	1	3	2	3			2		3	1	2	3
NOCA	1			3						2					1			3
RBGR	1	2		3	3	3	1		1	1			3		3	1	3	2
INBU	2		2	3	3					3	1		2		2	1	2	2
SCTA	2	1		3	2	3	1	3					2		2	1	2	2
PUMA*					1													
CLSW	3	1	3	3	3	3	1	3	3	3	3				3		1	3
BASW	3	3	3	3	3	3	1	3	3	3	3		3		3	1	3	3
TRSW	3	3	3	3	3	3	3	3	3	3	3		3		3	1	3	3
BASW	3	3	3	3	1	1		3							3		3	3
NRWS				3	3										2			1
CEWA	3	1	1	3	3	3	1	3	3	3	2		3		3	1	1	3
REVI	2	3	3	3	3	3	1	3	3	3					3	1	2	2
PHVI*																		
WAVI	2	2		3	2	3	1								3	1	3	1
YTVI*						1									2			
SOVI				2		2	1	3	2	3	3				2		3	1
BAWW	2	2	2	3	3	3	1	3	2	3	2				3	1	2	2
BWWA*																		
NAWA	3	2	2	2	3	3	1	2	2	2	1				2		2	2
TEWA																		
NOPA				2	2	1	1	3	3	3	3				1			2
CMWA																		
YEWA	2	3	3	3	3	3	1	3	3	3	3				3	1	3	3
BTBW				2	1	3	1	3							2		2	
YRWA	1	2	3	3	3	2	1	3	3	2	2				2	1	1	1
MAWA	2		1	3	2	1	1	3	3	2	1				2	1	2	1

	052	053	054	055	056	057	058	059	060	061	062	063	064	065	066	067	068	069
CSWA	3	3	3	3	3	3	1	3	2	3					2	1	2	2
BBWA														3				
BPWA*																		
BLWA		2		3	2	2		3	2	1					2			
BTGW	2	2	2	3	3	3	1	3	3	3	1				2		2	1
PIWA	2	2		2	2	2	1								2	1	3	
PAWA																		
PRWA*	3				2	1												
OVEN	3	2	2	3	2	3	1		2	2			3		3	1	3	3
NOWA		2		2	2										1		2	
LOWA*													2					
MOWA																		1
COYE	3	3	3	3	3	3	1	3	3	3	3				3	1	3	3
WIWA						1				2						2	2	
CAWA	1	2	2	3	3	2	1	3	3	3					2		3	
AMRE	2	3	2	3	3	3	1	3	3	3	3		3		2	1	1	2
HOSP	3	3	3	3	3	3		3	3	3					3	1	3	3
WAPI*																		
NOMO	1	3	1	3	3				2	3					2		2	3
GRCA	3	3	2	3	3	3	1	3	3	3	3				3	1	3	3
BRTH	2	2	2	3	3	3	1			2					2		2	
HOWR	2	3	1	3	3	1		3		2				3	3	1	3	3
WIWR	2					1	1	3	2	2					2		1	1
MAWR	2				3					1								
BRCK	2			3	3	3		3	3	1					1			
WBNU	3			3	3	3	1						2		3		3	1
RBNU	3	3		3	2	3	1	3	3	1	3				3		1	
TUTI*				3	2	1			3									
BCCH	3	3	2	3	3	3	1	3	3	3	3		3		3		3	3
BOCH								3										
GCKI						3		3	3	2								
RCKI		1				2	1	3	2	2					2			
BGGN*															1			
WOTH	3	2	2	3	3	3	1		1	3					2	1	2	2
VEER	2	2	2	3	3	2	1	3	2	2					2	1	3	2
GCTH*																		
SWTH								3	2	2	1							
HETH	2	3		3	3	3	1	3	3	2			2		2	1	2	
AMRO	3	3	3	3	3	3	1	3	3	3	3		3		3	1	3	3
EABL	3	1		3		3		3		3			3		3			3

Appendix E (continued)

	070	071	072	073	074	075	076	077	078	079	080	081	082	084	086	087
PBGR*																
CULO					2	3									1	3
ATPU*																
BLGU*									3	3	3	3				
RAZO*																
GBBG									3	3	3	3				
HEGU									3	3	3	3				
LAGU*																
RBGU*										3	3					
BOGU*																
COTE						1					3					
ARTE*																
ROTE*																
LETE*																
BLTE*																
LSPE*										3	3					
GRCO*																
DCCO									3	3	3	3				
COME																3
RBME*																
HOME	3	3	3	3	3	3		3							3	
MALL			1							1	3				1	3
ABDU	1		3		3					3	3					3
GADW*																
AMWI*																
GWTE				3								1	1			
BWTE			3				1	3								
NOSH*																
WODU	3	3	3	3	3	3	1	2			3				2	3
RNDU				3	1											
COGO															1	
COEI*							3		3	3	3	3	3			
CAGO			1	3												3
GLIB*																
AMBI								2								
LEBI*					3											
GBHE	2	1	1	1	1	1		2		3	3				3	3
SNEG*								3								
TRHE*																
LBHE*																
CAEG*																
GRHE					1	1		3								
BCNH*	1															
VARA*					2											
SORA*					2			2								
COMO*																
AMCO*																
AMWO	2		3			2	3	3	3		3					3
COSN		1					1	2								
WILL*																
UPSA*								1								
SPSA			3				3				3					3
KILL	2	3	3		1	2	3	3		2	3		1			3

	070	071	072	073	074	075	076	077	078	079	080	081	082	084	086	087
PIPL*										3						
SPGR																
RUGR			3	1			3	3	3		1					3
RNPH*										2	3					
WITU*																
RODO	2		3	1	1		3	3	1	1	3					
MODO	2	1	3	1	3		3	3	3	1	3		1			3
TUVU*			1					1								
NOHA			1					1								
SSHA			1							1						
COHA*										1						
NOGO			3													1
RTHA			1					2								1
RSHA								3								2
BWHA		3	3		2		2	3								3
BAEA			3		3					3	3					
AMKE	3	3	3	3	3		3	3	1		3					3
OSPR			3		3	3	3	2	3	3	3		1			
LEOW*																
BAOW		1	2				2	2	3							1
NSWO*			2	3			2									2
GHOW		1	3	3			1	1		1	2					1
YBCU			3								1					2
BBCU		1	3		1		2				1					2
BEKI	2		3	3	2	1	1	3			3					3
HAWO	2	1	3		1		3	2	1		1		1			3
DOWO	2	1	3	1	3		3	2	1							3
BBWO																
TTWO*																
YBSS					1		2				1					2
PIWO		3	2				1	3								2
NOFL	2	1	3	3	3		3	3	1	2	3		1			2
WHIP	2	1	2		1		2				2					1
CONI	2		1						1		1					
CHSW	3		3		1		2		1		3					3
RTHU	2	1	3		1		2	2			1					3
EAKI	3	1	3	1	1		3	3	2		3					3
GCFL		3	3	2			1	3					1			2
EAPH	2	2	3	3	2	2	3	3			3					3
OSFL			3				2									
EWPE	1	2	3	1	1	2	3	3	2							2
YBFL							2									
ALFL		1	3	1		2	2		2							
WIFL*			2		2											
LEFL		1	3	1	2	2	2	2								2
HOLA*																
BLJA	1	1	3	1	1	2	3	3			3		1			3
GRJA																
CORA		1	3	1			1	3	3		3		1			3
AMCR	2	2	3	1	1		1	3	1	3	3					3
EUST	3	3	3	3	3	3	2	3	3		3	3	3			3
BOBO	2	1	3	2	2		2	3	2				1			3
BHCO	2	1	3	1			3	1		1	3		1			3

	070	071	072	073	074	075	076	077	078	079	080	081	082	084	086	087
RWBB	2	1	3	2	3	2	3	3	3		3					3
EAME	3	3	3	3			2	3		3						
ORDR*																
NOOR	3	1	3	1	2		2	2	3			1				3
RUBL*																
COGR	3	3	3	2	3	3	3	3	3	2	3		1			3
EVGR					2		3								3	2
PIGR*																
PUFI		1	3		3		3				3		1			3
HOFI	3		3		3			3		2	2					
RECR*																
WWCR*														1		
ANGO	2	1	3		1		3	3	2	2	3		1			3
PISI			3		1								1			2
VESP			3	3												
SASP	1	2	3	3	1			3			2					
GRSP*																
STSP*								3								
WTSP	1	1	3				3	3		2	2		1			3
CHSP	1	1	3	1	1		2	2	2							3
FISP		1	3	2	3		2									
DEJU							2			2	3		1			3
SOSP	3	3	3	3	3	2	3	3	2	2	3		1			3
LISP																
SWSP	1	3	3		3		2	3								
FUSP*																
RSTO	1	1	3	1	1		3	2	2							3
NOCA			3					3	3		2					
RBGR	1	1	3		1		3	2	3	2	2					3
INBU		1	3			2	1									1
SCTA	1	2	3				2									2
PUMA*			1								3					
CLSW			3	1	3		3	3	3	3	3		1			3
BASW	3	1	3	3	3	1	3	3	3	3	3		1			3
TRSW	3	3	3	3	3	3	3	3	3	3	3		1			3
BASW			3	1	1		1	3			3					
NRWS			3		1											
CEWA	1	1	3	1		2	1	3	2		3					3
REVI	1	2	3	1	2	2	2	2	3							2
PHVI*																
WAVI		2	3	1			2									
YTVI*						3										
SOVI	1	1	3			2	2		2	3						1
BAWW		2	3	1			2	3		3	1		1			3
BWWA*																
NAWA		2	3	1			3	2					1			2
TEWA							2									3
NOPA		1	3		2	2	2	2	2	3	1		1			3
CMWA																
YEWA	3	2	3	2		2	2	3	2	3	3		1			2
BTBW		1	1				2			2						2
YRWA		1	3	1		2	2	3		3		3	2			
MAWA			3				3	2	2	2	2		1			2

	070	071	072	073	074	075	076	077	078	079	080	081	082	084	086	087
CSWA	1	2	3		1	2	3	2	2				1			3
BBWA													1			
BPWA*																
BLWA			3				2						1			2
BTGW		1	3			2	3	2	2	3	3		1			2
PIWA			3		2	2	2									
PAWA																
PRWA*							1									
OVEN	1	2	3	1	1	2	2	3	3				1			3
NOWA		1	3				2									3
LOWA*															1	3
MOWA																
COYE	3	1	3		2		3	3	1	3	3		1			3
WIWA							3			2						
CAWA		2	3	1		2	2	2		2			1			2
AMRE	1	1	3	1	2		2	3	2	3	2		1			3
HOSP	2	1	3	1			1	3		3	3					
WAPI*																
NOMO			1		1		1	3	3		2					
GRCA	2	3	3	1	2	2	3	3	2	3	3					3
BRTH	2	1	3	1	1						2					2
HOWR					1			3	3							2
WIWR		1	3				2	2					1			1
MAWR			3		2		2	2								
BRCR			3				1				1		1			3
WBNU			3	1	1		1	2	1		1					2
RBNU							2	2			1		1			2
TUTI*																
BCCH	1	1	3	1	1		3	2	3	2	3		1			3
BOCH																
GCKI							2		2		1		1			
RCKI							2	2				2	1			
BGGN*			3													
WOTH	1	1	3	1		2		2	3		2					2
VEER	1	1	3	1	2	2	3	3	3				1			2
GCTH*																
SWTH							2		2	2						
HETH	1	2	3				2	2	3		2		1			3
AMRO	3	3	3	3	3	3	3	3	3	3	3		1			3
EABL	1		3	3			3		3		1					3

Appendix E (continued)

	089	090	091	092	093	094	095	096	097	098	099	100	101	102	103	104	105
PBGR*		1				2						1				3	
COLO		1	3	3	3	3			3	3	3	3	1				
ATPU*																	
BLGU*													1	3	3	3	
RAZO*																	
GBBG													3	3	3	3	
HEGU													3	3	3	3	
LAGU*																	
RBGU*																	
BOGU*																	
COTE																3	
ARTE*																	
ROTE*																	
LETE*																	
BLTE*																	
LSPE*																	
GRCO*																	
DCCD													3	3	3	3	
COME																	
RBME*																	
HOME		1	1			3	3	3	3			3				3	
MALL		1	1	1	1	1		3	1			1	3				
ABDU		3	1	3	1	1	3	3	1	3						3	1
GAOW*																	
AMWI*																	
GWTE										3							
BWTE										3		1					
NOSH*																	
WODU	1	3	1	1	1	3	3	3	3	3		3	3				
RNDU		1										1					
COGU						3											
COEI*													3	3	3	3	3
CAGO												3	3				
GLIB*																	
AMBI					1	3	1	1	2	3							
LEBI*					2	2				2							
GBHE	1	1	1	2	1	3	1	1	1	1	1		1	3		3	3
SNEG*																	
TRHE*																	
LBHE*																	
CAEG*																	
GRHE		1						1									
BCNH*																	
VARA*			2	2	1	2	1			3							
SORA*										3							
COMO*																	
AMCO*																	
AMWO				1			2	2	2	3	1	3	3			3	
COSN					2	2	1	2			1	3					
WILL*																	
UPSA*				2						1	1						
SPSA				2	1	1		3	2	3			2			2	1
KILL	1		3	3	1	2	3	3	3	3	3		3			3	

	089	090	091	092	093	094	095	096	097	098	099	100	101	102	103	104	105
PIPL*																	
SPGR																	
RUGR			1	3	1	3	2	3	2	3		3	3			3	3
RNPH*	1						3										
WITU*																	
RODO	1	1	1	3	1	1	2	1	1				3			3	
MODO	1	1	2	2	1	2	2	2	2	3	1	1	3			3	3
TUVU*				2	2				1			3	1				
NOHA								1		1	3						
SSHA							1		1	1		1					
COHA*												1					
NOGO				2	1	1			1	2		1					
RTHA										1		2					
RSHA				2	2	1	1		1	3							
BWHA			3	3	1	3	1	2	2	1	2	1	1			3	
BAEA										1				3	3		
AMKE		1	1	2	1	3	3	3	3	3		3	2			3	
OSPR						3		1		3			3	3	3	3	3
LEOW*																	
BAOW	1			2		2	1			1		3	1				
NSWO*																	
GHOW	1		3	2	3	3	3	3	2	1	1	1	2				
YBCU				1		1	1	1	1								
BBCU			1	2	1	1	2	2	2	3	1	1				2	
BEKI	1	1	3	2	1	1	3	2	2	3	3	1	1			3	2
HAWO	1		3	3	1	1	3	3	2	3		2	2			3	3
DOWO	1	1	1	3	3	1	3	2	3	3	1	1	3			3	3
BBWO																	
TTWO*																	
YBSS		1	3	3	1	1	2	2	2	3	1						
PIWO	1		1	2	1	2	2	1	1	3			2				
NOFL	1	1	1	3	2	3	3	3	2	3	1	1	2			3	3
WHIP			2	2			2	2	1	1		1					
CONI							1	2	2	1	1						
CHSW	1	1	1	3	1	1	3	3	3	3			2			3	1
RTHU			1	2	1	1	3	2	2	3						3	2
EAKI	1	1	2	3	3	3	3	3	3	3	3	1	2			3	1
GCFL			3	2	2	3	2	2	2	3		3	2			1	
EAPH	1	1	3	3	3	1	3	3	3	3	3	3	3			3	
OSFL		1		2	1	1				2						3	
EWPE	1	1	2	3	1	1	2	2	2	3	1	1	2			3	1
YBFL										1						3	1
ALFL			2	2	2	1	1	2	2	1	1	2	2			3	1
WIFL*				2	2												
LEFL	1	1	2	2	2	2	3	2	2	2	1						
HOLA*				2							1						
BLJA	1	1	2	3	1	1	2	2	2	2	1	3	3			3	3
GRJA																	
CORA	1		1	2	1	2	3	1	1	1	1		1			3	3
AMCR	1	1	2	3	3	1	3	3	2	3	1	1	2			3	3
EUST	1	1	3	3	3	3	3	3	3	3	3		3			3	
BOBO	1	1	3	2	2	2	2	3	3	3	2		2			3	
BHCO	1	1	3	3	1	1	3	3	2	3	1		3			3	1

	089	090	091	092	093	094	095	096	097	098	099	100	101	102	103	104	105
RWBB	1	1	3	3	3	3	2	3	3	3	3	1	3			3	1
EAME	1	1	1	2	1	2	2	3	2	3	2		1				
OROR*																	
NOOR	1	1	3	3	2	3	3	3	3	3	1	3	2				
RUBL*																	
COGR	1	1	3	3	3	3	3	3	2	1	1	1	3			3	3
EVGR								1		3							
PIGR*																	
PUFI	1	1	1	3	2	1	3	1	2	3		2	1			3	3
HOFI			3					3	1				3				
RECR*																1	
WWCR*																1	
AMGO	1	1	3	3	2	2	3	3	3	3	1	2	2			3	3
PISI		1		2												1	
VESP				2				3		3							
SASP		1		3	1	2		2	2	2	3						
GRSP*																	
STSP*																	
WTSP	1	1	2	3	2	3	3	3	2	3	1	1	3			3	3
CHSP	1	1	3	2	2	3	3	2	3	2	1	2	3			3	3
FISP				2		3		2		2	2						
DEJU	1	1		3					1				3			3	
SOSP	1	1	3	3	3	3	3	3	3	3	3	3	3			3	3
LISP																	
SWSP			2	3	2	3	3		1	2			2			1	
FOSP*																	
RSTO	1	1	3	3	2	2	3	2	2	3	1	1	3				1
NOCA		1	3					2					2				
ROGR	1		2	3	2	2	3	2	2	3	1	1	2				
INBU	1	1	2	3	2	3	2			1	1		1			3	
SCTA	1	1	3	3	1	2	2	2	2	3		1	2				
PUMA*				1	3												
CLSW	1	1	3	3		1	3	1	3	3		3	3			3	3
BASW	1	1	3	3	3	3	3	3	3	3	3	3	3			3	3
TRSW	1	1	3	3	3	3	3	3	3	3	3	3	3			3	3
BASW	1		3	3	1	3	1	3	1	3		1	1			3	
NRWS		1						3	3	1			3				
CEWA	1	1	2	2	3	3	2	3	3	3	3	3	2			3	
REVI	1	1	2	3	2	2	2	2	3	3	1	2	3			3	3
PHVI*																	
WAVI			2	2	2	3	3	3	1				1				
YTVI*			3		1	2				1							
SOVI			1	2	1	1	1	1	2	3	1	3	3			3	3
BAWW	1	1	3	3	2	3	2	2	3	3	3	1	3			3	1
BWWA*																	
NAWA	1	1	1	3	2	2	2	2	1	3	1	1	3			3	1
TEWA	1															3	
MOPA				2	2	2		2	1	2	1	1	2			3	1
CMWA																	
YEWA	1	1	3	3	3	3	2	2	3	3	3	2	3			3	1
BTBW			2	3		1		3		2			2				
YRWA	1	1	3	3	1	2	2	3	3	2	1	1	2			3	3
MAWA	1	1	3	3	2	3		2		3	2		2			3	1

	089	090	091	092	093	094	095	096	097	098	099	100	101	102	103	104	105
CSWA	1	1	3	3	3	3	2	3	3	3	1	2	3			3	1
BBWA																3	
BPWA*																	
BLWA		1	1	2	1	1	1			2			1			3	
BTGW			2	2	2	3	2	2	2	3	1	2	3			3	1
PIWA		1	1	3	2	3	1	2	2	1			1				
PAWA	1																
PRWA*																	
OVEN		1	2	3	2	2	2	3	2	3	1	1	3			3	
NOWA			2	3	2	1	1	1		2		1	1				
LOWA*			3	3													
MOWA				3	1												
COYE	1	1	3	3	2	3	3	3	3	3	3	3	3			3	3
WIWA		1															
CAWA			3	3	2	2	2	3	1	3			3			3	1
AMRE	1	1	3	2	2	2	2	2	2	3	1		2			3	1
HOSP	1	1	3	3	3	3	3	2	2		1	3	3			3	
WAPI*																	
NOMO	.	1	1	2	1	3	1	1	3	1		1	1				
GRCA	1	1	2	3	3	3	3	3	3	3	1	2	3			3	3
BRTH	1		1	3		1	1		1	1	1	1	1				
HOWR	1	1	2	2	1	1	3	3	3				2				
WIWR	1			3	2				1	3		1	2			3	1
MAWR					2	2	1			3							
BRCR			1	3		1	3			1		1	1			1	
WBNU			1	2	2	1	3	1	3	3		3	3				
RBNU		1	1	3	1	3	1	1	2	3			1			3	3
TUTI*											3						
BCCH	1	1	3	3	2	3	3	3	3	3	3	1	3			3	3
BOCH																3	
GCKI				3						3			3			3	3
RCKI									1							3	
BGGN*				3													
WOTH	1	1	3	2	2	2	2	3	3	2	1	1	3				
VEER	1	1	3	3	2	2	2	2	2	2	1	1	3				
GCTH*																	
SWTH	1												1			3	3
HETH	1	1	2	2	2	2	2	2	2	3		1	2			3	
AMRO	1	2	3	3	2	3	3	3	3	3	3	3	3			3	3
EABL	1			2						3	3	3				3	

	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123
PBGR*									1									
COLU	1		1		1				1		3	3	1	2	3	3		1
ATPU*																		
BLGU*	1	3	1															
RAZO*																		
GBBG	3	3	3															
HEGU	3	3	3															
LAGU*																		
RBGU*																		
BOGU*																		
COTE		3																
ARTE*	2		2															
ROTE*																		
LETE*																		
BLTE*																		
LSPE*		3																
GRCO*																		
DCCU	1	3	1															
COME					1							1						
RBME*	1		1															
HOME					3				1		3	3	3	3				
MALL	3	3	3		1				3	2			3	1				
ABDU		3			3				3	3	1	3	1		3			
GADW*																		
AMWI*																		
GWTE																		
BWTE									1				2					
NOSH*																		
WODU					3			3	3	3	1	3	3	3	3			
RNDU											1							
COGO												3						
COEI*	3	3	3															
CAGO				3	1					1								3
GLIB*																		
AMBI		2			1				1	1	2	2	1					
LEBI*												1						
GBHE	2	1	2		1				1	3	1	1	1	1	2			
SNEG*																		
TRHE*																		
LBHE*																		
CAEG*																		
GRHE					1				1	2		1	2	1				
BCNH*																		
VARA*											3	2						
SORA*												1						
COMO*												3						
AMCO*												1						
AMWO	1	3	1		1		2		2	3	2	1	2		3			
COSN					1			2		2	2	1	2		1			
WILL*																		
UPSA*													1	3				
SPSA	1	3	1		1				1	3	1	1	2					
KILL	1	3	1						3	3	1	3	3	1	2	1		1

	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123
PIPL*																		
SPGR																		
RUGR	1		1		3			1	3	3	3	3	3		2			
RNPH*		1								3		1	1					
WITU*																		
RODU		1							3	3	1	1	3	1				
MODO	3	2	3		1		1		3	3	1	3	3	1	3	1		
TUVU*									1	2	1							
NOHA													2					
SSHA		3							1		1							
COHA*											1							
NOGO									3				2	3				
RTHA					1	3			3							1		
RSHA									3		3	1	2		2			
BWHA					1			1	2	1	3	3	3					1
BAEA	3	3	3															
AMKE					1				2	2	3	3	3	1	2			
OSPR	3	3	2		1					1	3	1						
LEOW*																		
BAOW		2			1			1	2		1	2	2		2			
NSWO*					3			1					2					
GHOW					1				1	3		1	2					
YBCU					1					2								
BBCU					1				3	3	2	1	2		2			1
BEKI	2		2		1			1	2	2	1	3	3	1	2	1		
HAWO	2		2		1	1			3	3	2	3	3	1	3	1		
DOWO	2	3	2		1				3	2	2	3	3	1	2	1		1
BBWO		1																
TTWO*																		
YBSS					3	2			3	2	3	3	1	3	2			
PIWO					3			1	3	2	1	1	2		2			
NOFL	2	3	2		3	2		1	3	2	3	3	3	3	2			1
WHIP	1		1		1				2	2			2		2		1	
CONI		1			1				1	1			2			1		
CHSW		1			1				3	2	1	3	2	1	2	1		1
RTHU	1	1	1		1				2	2	1	1	2		1	1		
EAKI	1	2	1					1	3	3	3	3	3	1	3	1		
GCFL		1			2			1	2	2	3	2	3	3	2	1		1
EAPH					3	1	1	3	3	2	3	3	3	2	3	1		1
OSFL		2			1	1			2	2	2	2	1					
EWPE	2	2	2		2	1			2	2	2	2	2	1	1	1		1
YBFL	1	2	1															
ALFL		2							2	1	1	1	2	1	1	1		1
WIFL*											1	1		1				
LEFL		1			2				3	1	2	2	2	1	1	1		1
HOLA*																		
BLJA	3	2	3		1		1	1	2	2	1	3	3	1	2	1		1
GRJA		3																
CORA	3	3	3		1				3	2	2	3	1					
AMCR	3	2	3		1	1	1	1	3	3	3	3	3	1	2	1		
EUST		3	1						3	3	3	3	3	3	3	1	1	1
BOBO	1		1					1	3	3	2	3	3	2	3	1		1
BHCO	2	3	2		1		1		3	2	1	3	3	1	2	1		

Appendix E (continued)

	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123
RWBB	2	2	2		2	1	1	2	3	2	3	3	3	2	3	1		
EAME							1		3	2	2	2	2	1	2	1		
OROR*																		
NOOR	1		1		2			1	3	3	3	3	3	1	3	1		1
RUBL*																		
COGR	2	3	2		1		1	1	3	3	3	3	3	3	3	1		1
EVGR					1		1	1					1					
PIGR*																		
PUFI	2	3	2		1	2		2	3	2	1	3	2	1	3			
HOFI									1			3	3					
RECR*		2																
WWCR*		3																
AMGO	2	2	2		2				3	3	1	3	3	2	3	1		1
PISI		2			1			1				1						
VESP									1			1			2			
SASP		3							3	2	2	2	2	2	1			
GRSP*																		
STSP*																		
WTSP	2	3	2	1	2	2	2	2	3	2	2	2	3	3	3	1		1
CHSP		2			1	1	1	2	3	2	1	3	3	1	2	1		1
FISP								1	3		3	1	2	1	2			
DEJU	1	3	1		2	2			3		2	1						
SOSP	2	3	2	1	2	1	1	1	3	3	3	3	3	2	2	1		1
LISP		3																
SWSP					2				3	1	3	3	2	1	3			
FOSP*																		
RSTO					1	1		2	3	2	2	2	3	1	2	1		1
NOCA									1	2		2	3	3				
RBGR	1		1		2	2			3	2	1	3	3	1	2	1		1
INBU									2	1	1	2	2					
SCTA					2	2			2	3	2	1	3	1	1	1		1
PUMA*										3		1			3			
CLSW	3	3	3						3	3		3	3	1	1	1		1
BASW	3	3	3		3	1	1	1	3	3	3	3	3	1	3	1		1
TRSW	3	1	3		3		1	1	3	3	3	3	3	3	3	1	1	1
BASW		3							3		3	3	3	3	3	1		
NRWS									3			3	2					
CEWA	1	2	1		1			1	3	3	1	2	3	1	2	1		1
REVI		2			2	3			3	2	2	3	3	3	3	1		1
PHVI*																		
WAVI					2				3	2	3	2	2	1	2	1		
YTVI*											2	3		2				
SOVI				1	3				3	1	3	2	2	1	3			1
BAWW	2	3	2	1	2		2	2	3	2	2	3	3	3	3	1		
BWWA*																		
NAWA		2			2	2	2	1	3	2	3	3	2	1	1	1		1
TEWA		1			1													
NOPA	2	2	2		1				1		2	1	1	1	2	1		1
CMWA		2			2													
YEWA	2	3	2		2			1	3	3	3	3	3	1	2	1		1
BTBW	2	1	2		2	2		1	2	1	2	1	2	1				
YRWA	2	3	2	1	2	2	1	1	3	2	2	3	2	1	1	1		1
MAWA	2	2	2			2	1		3	1	2	3	2		3			

	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123
CSWA		3			2	2	1	1	3	2	3	3	3	1	2	1		1
BBWA		1																
BPWA*		3																
BLWA	2	3	2		2	2			3			1	1					
BTGW	2	3	2		2	2	1	1	2	1	1	1	3	1	2	1		1
PIWA					2				3	2	2	2	2	1	2			
PAWA		3			1													
PRWA*																		
OVEN		3			3	3	2	2	3	3	3	3	3	3	2	2		1
NOWA	2		2		2			2	3	1	3	1	2	1	2	1		1
LOWA*				2			3											
MOWA																		
COYE	2	3	2		2	2	2	2	3	2	3	3	3	1	3	2		1
WIWA											2							
CAWA	2	2	2		2				2	1	2	1	2	2	2	1		
AMRE	2	3	2		2	2	1		3	3	3	3	3	1	3	1		1
HOSP		2							3	3	1	3	3	1	3	1		1
WAPI*																		
NOMO									3	2	1	3	3		2			
GRCA	2	2	2		2	1	2	1	3	2	3	3	3	1	2	1		1
BRTH					1	2			2	2	2	3	3	1	2			
HOWR									3	3	2	2	3	1	3			
WIWR		3			2				1		1	1	2	1				
MAWR											2	2		1	1			
BRCR		2			3				2	1	3	2	2	1				
WBNU					1				2	2	1	2	2	1	2			
RBNU		3			1	3		1	3	1	1	3	2	3	2			
TUTI*									1									
BCCH	2	2	2		3	2	1	1	3	3	3	3	3	2	3	1		1
BOCH	1	3	1															
GCKI		2							3			3						
RCKI	1	2	1		1													
BGGN*																		
WOTH					2	2	1	2	3	2	2	3	3	2	2	1		1
VEER		1			2	2		2	3	2	2	3	3	1	3	1		1
GCTH*																		
SWTH		2																1
HETH		3			3	2		2	2	1	1	3	2	1	2			
AMRO	3	3	3		3	1	2	3	3	3	3	3	3	3	2	3		1
EABL		1			3				3	3								

Appendix E (continued)

	124	125	126	127	128	129	130	131	132	134	135	136	137	138	139	140	141
PBGR*																	
COLU	3					1	3	2		1		3	2	3		2	3
ATPU*																	
BLGU*			3				2	3	1								
RAZO*																	
GBBG			3	3	3			3	1								
HEGU		3	3	3	3			3	1								
LAGU*																	
RBGU*								3	1								
BOGU*																	
COTE		1	1	3	3			3	1								
ARTE*								3									
ROTE*								2									
LETE*																	
BLTE*																	
LSPE*																	
GRCO*																	
DCCO		1	3	1				3	1								
COME						2	3	2			3						3
RBME*								1				1					
HOME																	
MALL							3	3			1	3				1	3
ABDU				1		3	3	3		1	3	3		3		1	3
GADW*																	
AMWI*																	
GWTE				3			1	3									
BWTE												1					
NOSH*																	2
WODU								3			3	3	1	3			1
RNDU						3	2	3				3					
COGU																	
COEI*		3	3	3	3		3	3	3								
CAGO	3										3			3			
GLIB*																	
AMBI								2			1		1	1		1	2
LEBI*								1									
GBHE	1	3	1	3				1		2	1	1	2		1		1
SNEG*																	
TRHE*																	
LBHE*																	
CAEG*																	
GRHE							3	2									
BCNH*			3														
VARA*								1									
SORA*								2									
COMO*																	
AMCO*																	
AMWO						3	3	3		1	3		1	1			3
COSN							2	2			3						
WILL*																	
UPSA*																	
SPSA	3		1	1			3	3			1	1	2	1	1	1	1
KILL	3					3	3	3		1	3			1	1	3	3

	124	125	126	127	128	129	130	131	132	134	135	136	137	138	139	140	141
PIPL*																	
SPGR																	
RUGR	3					3	1	3		3	3	3	3	3			3
RNPH*								1									
WITU*				1	1	1											
RODO	1					1	2	2		1	3	1				1	
MODO	1	1		3		2	3	3		1	3	3		3	1	1	3
TUVU*														1	1	1	
NOHA										1	1		1				
SSHA						3	1	3			1	1					
COHA*																	
NOGO							1		1				1	1			
RTHA							1	2		1	1	3		3		1	
RSHA										1		1	1				
BWHA				1		3	2	2		1	1	3	1	1		2	1
BAEA					3	3	3	1	3								
AMKE	2						1	2		1	3	1	2	3		1	3
OSPR	1	3	3	3		3	3	3	3			1					3
LEOW*								3									
BAOW								1			1		3	1			1
NSWO*						2											
GHOW								1		1	1		2	1			1
YBCU											1						
BBCU				1			2	2		1	3	1					
BEKI		1		3		1	2	2		2	1	2	3	1	1	1	
HAWO	1			3		2	2	2	1	2	1	1	1	1		3	1
DOWO	3	3	3	3		3	3	3		2	1	1	3	1	1	1	1
BBWO									1								
TTWO*																	
YBSS	1					3	2	3		1	1	3	3	1			1
PIWO							2			1	1	2	1	3			3
NOFL	3	1	1	3		3	3	3		3	3	3	3	1	1	1	2
WHIP							2	2		1	1						
CONI						1	2	2			3						
CHSW	3					1	2	2		2	1	1	1	1	1	2	1
RTHU	1					1	2	2		2	1	1	3				
EAKI	3			1		2	2	3	2	3	1	1	3	2	1	2	2
GCFL	2	1	1			2	2	3			1	2	1	2	1	1	2
EAPH	3	1				3	2	3		3	3	1	3	3	1	2	2
OSFL		1				3	2	2	2	2	1	2		2			
EWPE	1	1	1	1		3	2	3			1	2	2	2		1	1
YBFL						3	2	2									2
ALFL	1	1	1	3		3	2	2	2		1	1	3	1	1	1	2
WIFL*																	
LEFL	1		2			2	2	3		2	1	2	3	2	1	1	2
HOLA*																	
BLJA	3	1	1	3		1	2	3	1	3	3	2	1	3	1	1	1
GRJA						3	2		2	1		1					
CORA	1			3		3	2	3		1	1	3	1	3			2
AMCR	1	3	1	3		1	2	3	1	3	3	1		1	1	1	1
EUST	3	3	1	3		3	3	3	1	3	3	3		1	1	3	1
BOBO	3	3	2	1			3	2		3	1	3	2	3	1	1	1
BHCO	2			1		3	3	3		1	1	3	1	1	1	1	2

	124	125	126	127	128	129	130	131	132	134	135	136	137	138	139	140	141
RWBB	3	2		3		3	3	3		2	2	3	2	3	1	3	2
EAME	2						2	2		1	1	1			1	1	1
DROR*																	
NDOR	2		1			3	1	3		3	3	1	2	3	1	2	1
RUBL*													1				
COGR	3	3		3			3	3	1	2	1	3	2	2	1	1	1
EVGR						1	3	1		3	1	1	1				
PIGR*																	
PUFI	2		2	3		3	2	3	2	1	3	2	3	3	1	1	1
HOFI															1		
RECR*							2	3									
WWCR*						2	2	3	2								
AMGO	1		1	3		3	3	3		3	2	2	3	2	1	1	2
PISI						1	3	2	2								
VESP	3													3			
SASP	2						2	3			1	1		1			1
GRSP*																	
STSP*							2										
WTSP	3	3	2	3		3	2	3	2	2	2	3	3		1	1	2
CHSP		1	2	1			2	3		3	1	1	3	3	1	3	1
FISP								1		3	2		1		1		
DEJU	1			1			2	3	3	1	1	2	2	1			
SOSP	3	3	2	3		3	2	3	2	3	2	2	3	1	1	2	3
LISP						3	2	3									
SWSP						3	2	2			2			2		2	2
FOSP*																	
RSTO	2							3		2	1	1		3	1	1	1
NOCA										1						3	
RBGR	2	1	2			1	2	2	1	3	2	2	3		1	1	2
INBU	1							2		2	2	1		2	1		
SCTA	1					1	1	2		2	2	2	2	3	1	1	1
PUMA*								1								1	
CLSW	3	3				3	3	3	1	3	1	1			1	3	
BASW	3	2		3		1	3	3	1	3	3	3	3	3	1	3	1
TRSW	3	3	3	3		1	3	3	1	3	3	3	3	3	1	3	3
BASW	3					1	3	3	3	1	3	1		3		1	3
NRWS							1										1
CEWA	2	2	1			3	3	3	1	3	1	2	1	3	1	1	2
REVI	1	1	2	1		3	3	3		2	2	3	3	2		2	2
PHVI*										1			2				
WAVI	2	1						2			2		1		1	1	2
YTVI*																	
SOVI	2		2			3	2	3	2	1	2	2	1	2			1
BAWW	3	2	1	1		3	2	3	2	2	2	3	1	3	1	1	2
BWWA*																	
NAWA	3	1	3	1		3	2	2	2		2	1	1	1	1	1	2
TEWA						3	2	2	2			1		1			
NOPA	3	3	3	1		3	2	3	2		1		3		1		1
CMWA						2	2	2	2	1							
YEWA	3	2	2	1		3	2	3	2	3	2	2	3	2	1	1	2
BTBW	2		1			3	2	2			1	2	2	1			1
YRWA	2	1	2	1		3	3	3	2	2	2	3	3	1		1	1
MAWA	3	1	2	1		3	2	2	2		1	2		1			1

	124	125	126	127	128	129	130	131	132	134	135	136	137	138	139	140	141
CSWA	2		1	1		3	3	2	2	3	2	2	3	3	1	2	2
BBWA				1		3	2	3	2	1							
BPWA*						1	1	3	1								
BLWA	1		2	1		3	2	3	2		1	2	3		1		1
BTGW	1	1	2	1		3	2	3	3			2	2			1	1
PIWA	3							1			1	2				2	2
PAWA						3	2										
PRWA*																	
OVEN		1	2			3	3	2		2	2	3	2	3	1	1	2
NOWA			2			3	2	1			1		3	1	1		3
LOWA*										2							
MOWA															1		
COYE	3	2	2	1		3	3	3	2	3	2	3	3	3	1	1	2
WIWA							1	1				1					
CAWA	3		2	1		3	2	2			1			3	1		2
AMRE	3	1	2	1		3	3	3	2		2	3	3	2	1	2	2
HOSP	3						3	3		3	3	1			1	3	1
WAPI*																	
NOMO	2										3			1			
GRCA	3	1		3		3	2	3	2	3	3	3	2	1	1	1	2
BRTH	1							3		2		1	2			1	1
HOWR										3	3			3	1	1	2
WIWR	1						2	3	2			2		3			1
MAWR																	
BRCR						1	2	2		1	1	2					1
WBNU								1		2	1	3	3	1			
RBNU	1	2	1	1		3	3	3	1	1	1		1	1			3
TUTI*																	
BCCH	3	1	1	3		3	3	3	1	3	3	2	3	2	1	1	3
BOCH			1				2	2	1			1					
GCKI	1	1	2	1		2	3	2	2								
RCKI	1		2			2	2	2	2	2		2					
BGGN*																	
WOTH	2	1	1			2	2	2	3	3	2	2	2	1	1	1	1
VEER	2	1	1			1	2	2		3	2	2	2	2	1	1	2
GCTH*																	
SWTH		1		1		3	2	3	2			2	3	2			
HETH	1		1			3	2	2	2	1	1	2	3	3			2
AMRO	3	3	1	3		3	3	3	3	3	3	3	3	3	1	2	2
EABL										3	3	3					

Appendix E (continued)

	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
PAGR*	1	2					3											
COLO	3	3	1	3	3	3	3				3	3						
ATPU*																		
BLGU*																	3	3
RAZO*																		
GBBG														3			3	3
HEGU														3	3		3	3
LAGU*																		
RBGU*																	1	3
BOGU*																		
COTE												3		2			1	3
ARTE*																	1	3
ROTE*																	1	3
LETE*																		
BLTE*		3																
LSPE*																		3
GRCO*																		
OCCO										3		1			3		3	3
COME																		
RBME*																		
HOME	3	3		3	3	3	3				3			3				
MALL		2		3			1				1			3			1	
ABDU	1	3			3		3				3	1		3			3	
GADW*																		
AMWI*																		
GWTE		3									3						3	
BWTE		3									3							
NOSH*																		
WODU	3	3		3	3	3	3				3							
RNDU		3		2			3				3							
COGO							3											
COEI*										3							3	3
CAGO	3			3			3				3							
GLIB*																		
AMBI	2	2		2	2						2							
LEBI*		2																
GBHE	1	1		1	1		3		3	1	1	1					1	3
SNEG*																		
TRHE*																		
LBHE*																		
CAEG*																		
GRHE	1			1						2							1	
BCNH*		1																
VARA*		3		3	1						2							
SORA*																		
COMO*																		
AMCO*		1		1														
AMWO	2	2		1	1									3			2	
COSN	3	2	2				1				2							
WILL*																		
UPSA*																		
SPSA	1	1	1	1	3		1	2	1	1	3			1	1		3	3
KILL	3	3	1	3	3	1	2	2	3	3		2			2		3	

	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
PIPL*																		
SPGR										3							3	
RUGR	3	2	2	1	3		1		3	3	2	3					3	
RNPH*				3														
WITU*							1	3	3									
RODO	1	1	2	3	2					3		1					1	
MODO	3	3	2	3	3		1	1		3		1				3	3	
TUVU*																		
NOHA	1	2	1															
SSHA												1				2		
COHA*																		
NOGO	1	3	2				1			1							1	
RTHA		1										1				2		
RSHA				2														
BWHA	1	3	3	2	1	1	3			1		1		1		2	3	
BAEA				1							3	1		3	3	3	3	3
AMKE	1	1	1	3	1	3	1	1				1				2	1	
OSPR	1			1	3				3	3	1	2	3		3	3	3	3
LEOW*																		
BAOW	1	2		2	1					1		2						
NSWO*										1								
GHOW	2		3	2	1												3	
YBCU	2			2	3													
BBCU	2	2		3	2					1	1	3					2	
BEKI	1	1		2	1			1		1	1	3		1	2		3	
HAWO	3	1	1	1	3		1	1		3		1					3	
DOWO	3	2	1	1	3		2	1	3	3		1		3			3	
BBWO																	2	
TTWO*																		
YBSS	3	1	1	2	1		1	1				1		1			2	
PIWO	1			1	1							1						
NOFL	1	2	2	3	1		1	1	1	3	1	2		3	3		3	
WHIP					1												2	
CONI				1	1							2		1			2	
CHSW	1	1	1	1	3	1	1		1	3	1	3		1	2		1	
RTHU	3	1		1	1	1	1				1	1					1	
EAKI	2	3	1	3	3	1	2	1		3	1	3		1			3	
GCFL	3	2	1	2	3	1	1	1	1	1	1	1		1				
EAPH	1	3	1	3	3	1		1		3	1	2			1	2	3	
OSFL	1	1		1			1			2	2	2			2		1	
EWPE	3	3	1	2	3	1	2	1	1	2	1	2		2	1	2	1	
YBFL										1	1						2	
ALFL	2	2	1	1		1			1	2		2				2	3	
WIFL*		2																
LEFL	3	1	1	2	3	1	1	1		1		1		2	1		2	
HOLA*								1										
BLJA	2	2	1	1	3	1	2	1	1	3	1	2		1		3	3	
GRJA																	3	
COPA	3	2		1	1				1	1	1	2		1		2	3	3
AMCR	1	2	2	1	1	1	1	1	3	3	1	1		1		2	3	3
EUST	3	3	1	3	3		1	1	1	3		3		3		3	3	
BOBO	2	3	2	3	3	1	2	1		2		1		3			3	
BHCO	3	3	1	3	3	1	1	1		1	1	1		1		2	2	

	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
RWBB	2	3	2	3	3	1	2	2	2	3	2	1		3		2	3	
EAME	2	1	2	3	1		1	1		2		1		3				
ORDR*																		
NOOR	3	3	1	3	3		1	1		3		3		2		2		
RUBL*																		
COGR	2	3	3	3	1	3	3	1	3	3	1	1		3		3	3	
EVGR												1		1			1	
PIGR*																		
PUFI	3	2	1	3	3			1	1	3	2	1		2		2	3	1
HOFI	1																	
RECR*																		
WWCR*																	2	2
AMGO	1	3	1	3	3	1	1	1	1	3	1	2		3	3	3	1	
PISI	3						1		1		1	2		1			1	
VESP														2				
SASP	2		2	1								1		3			3	
GRSP*																		
STSP*														3			2	
WTSP	2	3	1	2	3	1	1	1	3	3	2	2		3	2	2	3	
CHSP	3	3	1	3	1	1	1	1		2	1	1		3	1		2	
FISP	1	1		1										2				
DEJU								1			1	1		2		2	3	2
SOSP	3	3	1	3	3	1	1	3	3	3		1		2	2	2	3	3
LISP												1					3	
SWSP	2	2	1	1		1	1		2	2	3	1		2			3	
FOSP*																		
RSTO	3	3		2	1	1			3					2			2	
NOCA	1																	
RBGR	3	3	1	1	2	1	1	1	1	2	1	3		2		2	2	
INBU	2	1		1	1				1	2		1						
SCTA	2	2	1	1	3	1	1					3		2				
PUMA*		3		3	3					1								
CLSW	1	3	2	3	3				3	3				3			1	
BASW	3	3	1	3	3	1	2	3	1	3	1			3			3	
TRSW	3	3	1	3	3	3	3	1	1	3		3		3	2	3	3	
BASW	3	3	3	3	3			1				3		3			3	
NRWS										3				1				
CEWA	2	3	1	1	3	1	1	1	1	3		3		3		2	3	
REVI	3	3	1	2	3	1	2	1	3	2	1	2		2			2	
PHVI*																		
WAVI	2	2	1	2	3			1				2						
YTVI*	2		1															
SOVI	2	1	1		2	1	1	1		2	2	2		2		2	3	
BAWW	3	3	2	2	3	1	2	1	3	2		3		2	2		3	
BWWA*																		
NAWA	1	3	1	1	3	1	1	1	3	3	2	2		3		2	3	
TEWA												3					2	
NOPA	1	1	2	1		1	1	1	1	2		3		2	2	2	3	
CMWA									1		2	1					2	
YEWA	3	3	1	3	3	1	1	1	3	3	1	2		3	3		1	
BTBW	1	1		1	1		1			2		1		2			2	
YRWA	1	2		1	1	1	1	1	1	3	1	3		2	1	3	2	
MAWA	2	1		2			1	1	3	3	2	1		2			3	

	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
CSWA	2	3	1	2	3	1	1	1	3	3		3		2	2	2	2	
BBWA												3		1			2	
BPWA*																	1	
BLWA	1	2			1		1	1		2	1	1		1	2	2	2	
BTGW	2	2	1	1	1	1	1	1	1	2	1	3		3	2	2	3	
PIWA	1	1	1	1	1				3									
PAWA		3															3	
PRWA*		1																
OVEN	2	2	1	3	2	1	2	1	2	3	2	3		3		2	2	
NOWA	2	1	1	1	1		1	1		1	2	3		2			1	
LOWA*																		
MOWA		1										3						
COYE	3	3	1	3	2	1	1	2	3	3	2	3		2	2		3	
WIWA		1												2			2	
CAWA	2	3	1	1				1	1	2	2	3		3			1	
AMRE	3	3	2	2	3	1	1	1	3	2		3		2	2	3	3	
HOSP	2	1	1	3	3		1	1	3	3		1		1			3	
WAPI*																		
NOMO	2	2		3								2						
GRCA	3	3	1	3	3	1	1	1	3	3	3	1		2	2	2	3	
BRTH	1	3	1			1	1			1				1			3	
HOWR	1	2	1	1														
WIWR	1									1	2	2		1			2	
MAWR		2		2	2						3							
BRCR	3	3						1	1	1				1			1	
WBNU	3	1	1	1	1	1	1		1	1		2		1				
RBNU	3	1			1				3	1	2	2					2	
TUTI*																		
BCCH	3	3	1	2	3	1	2	1	3	3	1	2		3			3	
BOCH																	2	
GCKI									1	3				2		2	2	
RCKI							1				2			2		2	2	
BGGN*																		
WOTH	2	1	1	2	1	1	1	1	1	2	1			2		2	3	
VEER	3	3	1	3	3	1	1	1	2	2	1	3		2			2	
GCTH*																		
SWTH												2		2		2	3	
HETH	1	2	1	2	1		2	1		2	1	2		3			3	
AMRO	3	3	2	3	3	1	1	1	3	3	1	3		3	3		3	
EABL	3	3								3		2						

Appendix E (continued)

	160	161	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177
PBGR*												2		2			
COLO					2			3	3	2	3	3				1	
ATPU*																	
BLGU*	3	1															
RAZO*		3															
GBBG	3	3															
HEGU	3	3															
LAGU*																	
RBGU*																	
HOGU*																	
COTE	3	1															
ARTE*	3	1															
ROTE*																	
LETE*																	
BLTE*																	
LSPE*																	
GRCO*																	
DCCO	3	3								1							
COME							3			1	3						
RBME*																	
HOME						3	1	3	3	3	3	3	1		3		
MALL		3					3	3		1			1	1			
ABOU		1			1	3	3	3	3	3	1	3	1			3	
GADW*																	
AMWI*																	
GWTE									3	3							
BWTE							1		2	2							
NOSH*																	
WOOU						3	3	1	3	3	3	3	3		3		
RNDU								1				3					
COGO																	
COEI*	3	3															
CAGO							1	3			3						
GLIB*																	
AMBI							2	2	1			2	1			2	
LEBI*										1							
GBHE	3	1				1	1	1	1	3	1	2	1	1			
SNEG*																	
TRHE*																	
LBHE*																	
CAEG*																	
GRHE		1					3	1	1			2	1	1			
BCNH*		1															
VARA*												1					
SORA*												1					
COMO*																	
AMCO*																	
AMWO		2				2	2	3	2	3	1	3	2				2
COSN							2	2	2	2		2					
WILL*																	
UPSA*														2			
SPSA		3			1		2	1	3			2	1				
KILL		3			1	3	3	1	3	3	1	3	3	3		3	1

	160	161	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177
PIPL*																	
SPGR	1	3	3					2									
RUGR		3	3	2	1		3	3	3	1	3	3	1				
RNPH*										1		2					
WITU*																3	3
RODO					1		3	1	2		1	2	3	1		1	
MODO		2			3	1	3	2	3	2	3	3	3	1			1
TUVU*																	1
NOHA	1	3					1				1	1					
SSHA		3			1		1		1	1		1	1				
COHA*																	
NOGO		2						1		3		2	3			3	
RTHA			2				1		1			1	1	1			
RSHA							1						1				
BWHA			2	2	1		3	1	1		2	3	3	1			
BAEA	3	3					1					1	1				
AMKE		1	2		1		2		2		2	3	1			1	
OSPR	3	3					1			3		3	1	1			
LEOW*																	
BAOW		2					2					2					
NSWO*										1							
GHOW		2					3	2	1			2			3	3	
YBCU			2				1					1					
BBCU		1		2			2	1			3	2	2				
BEKI		1			1	2	3	1	3	2	1	2	1	1			
HAWO		3	1	2	2	1	3	3	1	3	3	2	1	1			
DOWO	1	3	1		2	1	3	1	1	2	2	2	3	1			1
BBWO	1	1	3														
TTWO*																	
YBSS				2	1		2	3	1	2	2	3	1				2
PIWO			2		1		2	1	3	2	2	2	1				
NOFL	1	3	1	2	1	3	3	2	3	3	2	3	2	1		3	1
WHIP							1	2	1	2		1					
CONI		2					2		1			2	1	1			
CHSW			2		1		3	3	1	3	1	2	3	1		1	
RTHU		2	1	1	1		2	1	3	2	3	2	1				
EAKI		3	1	2	1		2	3	3	3	3	2	3	3		1	1
GCFL		2	2	2	1	2	2	2	2		2	2	1	1			
EAPH		1			1	2	3	3	3	3	3	3	3	1			1
OSFL		2								2	1	2	1	1			1
EWPE		2	3	3	1		2	2	2		2	2	1	1			1
YBFL	1	2	2	1						2						1	
ALFL	1	3	2	3	1		1	2	1	2	1	2	1	1			1
WIFL*								1			1			1			
LEFL			3	3	1	2		2	2	3	2	2	1	2			1
HOLA*																	1
BLJA		2	1	3	3	1	3	3	2	3	2	3	1	2			1
GRJA		1	3														
CORA	1	3	3	2	2		2		1	1		2					
AMCR	3	3	1		1		3	3	1	1	2	3	3	1			1
EUST		3		1	1	3	3	3	3	3	3	3	3	3	3	3	1
BOBO				2	1		2	2	1	1	2	2	2	3		2	3
BHCO	1	3		1	3	3	3	3	1	1	1	3	3	3		2	1

Appendix E (continued)

	160	161		163	164	165	166	167	168	169	170	171	172	173	174	175	176	177
RWBB	1	3		3	3	2	3	3	3	2	3	2	3	3	3		2	1
EAME						1			1	2	2	1	2	3	2			1
OROR*																		
NOOR					3	1	3	3	3	2	3	3	3	3	3			1
RUBL*						2												
COGR	1	3			3	3		3	3	2	3	3	3	3	3		3	3
EVGR	1	2		2		3		1			1						1	
PIGR*																		
PUFI	3	3		3	1	3	2	2	2	3	3	2	2	2	2			1
HOFI											2	1		2				
RECR*		2						1										
WWCR*	2	3																
AMGO	3	3		1	3	3	3		2	1	3	3	3	3	1		1	1
PISI	2	3		1		1					3							
VESP												1						
SASP		3			3	1		1	2	1		1	2	1	1			1
GRSP*																		
STSP*	2																	
WTSP	3	3		3	3	2	1	2	2	1	2	3	3	3	2		3	2
CHSP		2		3	3	1	2	3	3	3	3	2	3	3	2		1	1
FISP					1				2	1	2	1	2	2	1			1
DEJU	3	3		3	3						3	3	3					1
SOSP	3	3		3	1	2	3	3	2	3	2	3	3	3	3		2	3
LISP		3		3					1									
SWSP		2		2	3				2	1		2	2	3				1
FOSP*																		
RSTO		1		2	1			2	2	1		1	2	1				
NOCA										1	2			3	1			
RBGR	1			2	3		2	2	2	2	2	1	2	1	1		1	1
INBU					1	1		2	2	1		1	2	2				
SCTA		2		2	3	1		2	1	1	1	2	2	2			1	1
PUMA*											3	3		3				
CLSW		1			1		3	3		3		3	3	3				
BASW		3		1	3	3	3	3	3	3	3	3	3	1	1		3	1
TRSW		3		3	3	1	3	3	3	3	3	3	3	3	3	3	1	1
BASW	1	2			3	3		3	3	3		3	3				3	
NRWS								1						3				
CEWA	1	3		2	2	1		3	1	1	3	1	3	3	1		3	1
REVI	2	2		3	3	1	3	2	2	2	2	3	3	1	1		2	1
PHVI*				3						1								
WAVI							1		3	1	3	1	3	1	1			1
YTVI*								2				2						
SOVI	3	3		2	2	1			1			2	2	1				2
BAWW	2	3		2	3	1		3	3	2	2	3	2	3	1		2	1
BWWA*																		
NAWA	2	3		2	2	1			2	3	2	1	2	1			1	1
TEWA	2	3		2							2							1
NOPA	3	3		3	3			2	1	1	2	2	1	1				1
CMWA	2	2		2	1						2							
YEWA		3				1	3	2	3	3	2	3	2	3	2		2	3
BTBW		1		3	3			2	2			1	2	1				3
YRWA	3	3		3	2	1		2	2	1	2	3	2	1				1
MAWA	3	3		3	2	1			1	1	2	3	2	1				1

	160	161		163	164	165	166	167	168	169	170	171	172	173	174	175	176	177
CSWA		2		3	2		2	1	2	2	2	3	3	1	2		2	2
BBWA	3	3		2	1						2	1						
BPWA*		2		3	1													
BLWA	3	3		2	3			2	2	1	2	1	1	1				
BTGW	3	3		3	3			2	2			2	2	1				
PIWA					1					1		2	2					
PAWA		3															3	
PRWA*																		
OVEN	2	3		3	3	1	2	3	2	2	2	2	3	2	1		2	1
NOWA	2	2		3	2			1	2	1	2	3	1	2				2
LOWA*																		
MOWA		1																
COYE	3	3		3	2	1	3	3	2	3	2	3	3	3	2		2	3
WIWA	2	3		1				1										
CAWA	2	3		3	2			1	2	2	2	1		1				3
AMRE	3	3		2	3		2	3	3	2	2	3	3	1	1		2	2
HOSP		1			1	3		3		3	3	1	3	3	1		1	3
WAPI*																		
NOMO								3		1		1		3	1			
GRCA	1	3		2	3	2	3	3	2	3	2	3	2	3	3		2	1
BRTH					1			2	2	1		1	2	1	1			
HOWR					1	2	3	3	1		3	3	3	3				
WIWR	2	3		3	1	1		2	1			2	2	1				2
MAWR									2				3					
BRCR	2	3		2	1			1				2	2					
WBNU					1	2		1	3	1	3	2	2	3				
RBNU	3	3		3	3	2		3			3	1	1	1				
TUTI*																		
BCCH	1	3		3	3	3	3	3	2	2	3	3	3	3	1		2	1
BOCH		3		3				2										
GCKI	3	3		2	1						2							
RCKI	3	3		2	1						1	1	2					
BGGN*																		
WOTH				3	3	1	2	2	2	2	2	2	3	2	1		1	1
VEER		1		2	3	1	2	2	3	2	2	2	3	1	1		2	1
GCTH*				3														
SWTH	3	3		3	1													
HETH	3	3			1	1		2	2	3	2	2	2		1		1	1
AMRO		3		3	3	3	3	3	3	3	3	3	3	3	3		2	1
EABL				1	3	3		3	1	3		3	3					

Appendix E (continued)

	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194
PBGR*			2														
COLO	1		3	3	3		3	3	3							2	1
ATPU*																	
BLGU*											3		1	3	3		
RAZO*																	
GBBG											3	1	3	3	3		
BEGU											3	1	3	3	3		
LAGU*																	
RBGU*																	
BOGU*																	
COTE											1	1	1	1	1		
ARTE*											1		1	1	1		
ROTE*																	
LETE*																	
BLTE*			2														
LSPE*														3			
GRCO*															1		
DCCO											3	1	3	3	3		
COME					3	3											
RBME*																	
HOME			3		1							1		1			
MALL						3						3	3	1			
ABDU		1	3		3	1		3	3		1	3	3	3			
GADW*																	
AMWI*																	
GWTE											2	3	1	1			
BWTE			3									2					
NOSH*												1					
WODU			3				3		1			1	3				
RNDU			3						3			1					
COGO																	
COEI*											3		3	3	3		
CAGO												1	1	1		3	
GLIB*																	
AMBI			2					1	1			2	1	1			
LEBI*	1		1														
GBHE			2		1	1	3	1			3	1	1	1	3		
SNEG*												1	1				
TRHE*																	
LBHE*																	
CAEG*																	
GRHE			1									1	1	1			
BCNH*																	
VARA*			3														
SORA*																	
COMO*																	
AMCO*																	
AMWO		2	1		3	3					2	2	2	3	2		1
COSN			2		1						2	3	2	3	2		
WILL*													1				
UPSA*	2				1					3							
SPSA		3	3		1						2	3	3	3	3		
KILL	2	1	3		3	3				3	3	3	3	3	1		

	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194
PIPL*																	
SPGR											3	3	3	3			
RUGR		3	3		3	1					3	3	3	3			1
RNPH*		1									1	2			1		
WITU*	3	3															
RODO	3		2		2	2				3	3	3	3	3			
MODO	2	1	2		2	2				3	3	3	3	3	1		
TUVU*		1	1														
NOHA		1	1		1					1	2	3	2	1	1		
SSHA					1	1				1	3	3	3	3			
COHA*																	
NOGO					1					1	1	1	2				
RTHA		3															
RSHA					1												
BWHA	1	3	2		2	1				2	3	3	3	3			
BAEA			3			3	3	3		3	3	3	3	3	3		
AMKE	2	2	3		1	1		2		3	3	3	3				1
OSPR			1	3	1	3		3	3	1	3	3	3	3	3		
LEOW*																	
BAOW					2	2					1	2	1	3		2	
NSWO*												1	1	1			
GHOW		3	1		2						1	2	3	3			
YBCU					1												
BBCU		2			3	3					1	2		2			
BEKI	3	2	3		1	3				1	3	3	3	3			1
HAWO	2	3	1		2					3	2	3	3	2		1	1
DOWO	1	1	3		2	1				2	2	3	3	1		1	
BBWO												1	3	2			
TTWO*																	
YBSS	2	2			2	2					3	2	3	2			2
PIWO			1		2						1	2	1	1			
NOFL	2	2	3		2	2				2	3	3	3	3	3	1	
WHIP		2								2	2	2		2			
CONI		2				2				2	2	2	3	3			
CHSW	2	2	1		2	2				1		3	1	3			1
RTHU	2	1	1		2	1					3	2	3	3			2
EAKI	1	3	2		2	2				2	2	3	3	3		1	
GCFL		2	2		1	1					1	1	2			2	
EAPH	3	3	2		2	3		1		2	3	3		3			1
OSFL	1	2									1	1	3	2			1
EWPE	2	3	2		2	2					2	2	2	2		2	1
YBFL											3	3	3	2			1
ALFL	2	2	2		2	2				2	2	2	3	3	1		
WIFL*											1		2				
LEFL	1	2	2		2	2				2	2	3	2	2		2	1
HOLA*																	
BLJA	3	3	2		2	1				1	3	3	3	3		1	
GRJA											3	3	3	3			
CORA	1	1	1		1	3				1	2	3	3	3	3		1
AMCR	2	2	1		3	3				3	3	3	3	3	3	1	1
EUST	3	3	3	3	3	3		3		3	3	3	3		2		1
BOHO	2	3	2		2	2				3	3	2	3	1			
BHCO	2	2	3		3	1				1	1	2	3	1			

	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194
RWBB	2	2	3		2	2				3	3	3	3	3	2		1
EAME	2	2	3		2	1				3	1		3	1			
OROR*																	
NOOR	1	3	3		3	1				3							
RUBL*																	
COGR	3	3	1		3	3				1	3	3	3	3	2		1
EVGR					1					1	2	2	2	2			
PIGR*																	
PUFI	1	2	2		2	2				2	2	2	3		2		1
HOFI					3												
RECR*														2			
WWCK*												2	2	2			1
AMGU	2	2	2		2	2				2	2	2	3	3	1	1	1
PISI					1					1	2	1	2	2	1	2	
VESP					1					2	2	2	3	1			
SASP	1	3	2		3	2				2	3	3	3	3	1		
GRSP*																	
STSP*			3								2	3	1	3			
WTSP	2	3	3		3	2				2	3	3	3	3	2	2	1
CHSP	3	2	2		3	3				3	3	3	3	3		1	
FISP		1	3			1				1		1					
DEJU			2		2	1				2	3	3	3	3	2		1
SOSP	3	3	3		3	2				3	3	3	3	3	3	1	1
LISP		1									2	3	3	3	1		
SWSP	1	1	3		1	2				2	2	2	2	3			1
FOSP*																	
RSTO	3	3			1								1				
NOCA		2															
RBGR	2	3	2		2	1				2	2	2	1	1		2	
INBU	2	1	2		1	2				2			1				
SCTA	2	2	2		2	1				2	2	2	2	2			1
PUMA*					1												
CLSW	3	3	3		3	3				3	3	3	3	3			
BASW	3	2	3		3	3				3	3	3	3	3	1		1
TRSW	2	3	3		3	3				3	3	3	3	3	3	1	1
BASW	3		3		1	3				3	3	3	3	3			
NRWS			3			2											
CEWA	2	3	1		3	1				3	3	3	3	3	2	1	1
REVI	2	2	3		2	3				2	3	2	2	3	1	2	1
PHVI*		1															1
WAVI	1					2				2							
YTVI*																	
SOVI	2	2			2	1				2	3	3	3	3	3		1
BAWW	2	3	3		3	2				3	3	3	3	3	2	1	
BWWA*																	
NAWA	2	1	3		3	2				3	3	3	3	3	2	1	
TEWA										2	2	2	3	3	2		
NOPA	2	1	2		3	2				3	3	3	3	3	2	1	
CMWA											3	2	3	2	2		
YEWA	2	3	2		3	2				2	3	3	2	3			1
BTBW	1	1	2		2	2					2	2	2	2			1
YRWA	3	3	3		2	3				3	3	3	3	3	2	2	1
MAWA	3	3	3		2	2				2	3	3	3	3	2	2	1

	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194
CSWA		3	3		2	2				2	3	3	3	3	2		1
BBWA					1						3	3	3	3			
BPWA*											1			3	2		
BLWA		1	2		3					2	3	3	3	3	2		1
BTGW	1	1	2		2	2				3	3	3	3	3	3		
PIWA																	
PAWA											3	3	3	3			
PRWA*																	
OVEN	2	2	3		3	2				2	3	3	3	3		2	1
NOWA	2	2	2		2	3				2	1	3	2	2			
LOWA*																	
MOWA													2	1			
COYE	3	3	3		2	3				3	3	3	3	3	3	2	1
WIWA										2	1	3	3	3	2		
CAWA	2		2		2	3				2	2	3	3	2			1
AMRE	3	3	3		2	2				3	3	3	3	3	2	2	1
HOSP	3	3	3		3	3				3	1	3	3	1			
WAPI*																	
NOMO												2	3				
GRCA	3	3	3		2	2				3	2	3	3	2	2		
BRTH					3	1				3	2	2	3				
HOWR						1											
WIWR		2	2		2	3				2	2	2	3	3	2		1
MAWR			2														
BRCR		1			2							2	3	3			
WBNU		1	1		1							1	1				
RBNU	1	1	1		1	3					2	2	3	3	2		
TUTI*																	
BCCH	3	3	3		3	3				3	3	3	3	3		1	1
BOCH					1						1	3	3	3	2		
GCKI	1		3		1					2	3	3	3		2		
RCKI	1				2	1				2	2	2	3	3	2		
BGGN*																	
WOTH	1	2	2		3	2				2	2	2	3	1		2	1
VEER	3	2	2		2	2				2	2	2	2	2		2	1
GCTH*																	1
SWTH					2	1				2	2	3	3	3	2		1
HETH		3	2		3	3				3	3	3	3	3	2		1
AMRO	3	3	3		3	3				3	3	3	3	3	3	3	2
EABL												1					

Appendix E (continued)

	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213
PBGR*					3	3												
COLO			3		1	3		1				2				3	3	3
ATPU*																		
BLGU*																		
RAZO*																		
GBBG																		
HEGU																		
LAGU*																		
RBGU*																		
BOGU*																		
COTE			1															3
ARTE*																		
ROTE*																		
LETE*																		
BLTE*												3						
LSPE*																		
GRCO*																		
DCCO																		
COME		3	3		1	1												3
RBME*																		
HOME		3			3	3						3		3		3		
MALL		1	1	3		3	3	1				3		2				
ABDU		1	3			3	3					3		3		2		1
GADW*																		
AMWI*																		
GWTE						2	1					1		2				
BWTE						3						3		3				
NOSH*																		
WOOD		3	1			3	3					3		3				
RNDU					3	3	3					1				1		
COGO												3						3
COEI*																		
CAGO			1	3								3						
GLIB*																		
AMBI		1	1			3	3			1		1	1	2				
LEBI*																		
GBHE	3	1	1		1	3	2					3						
SNEG*																		
TRHE*																		
LBHE*																		
CAEG*																		
GRHE		2				2						1		1		2		
BCNH*																		
VARA*						1						3	1	3				
SORA*												3						
COMO*												1						
AMCO*																		
AMWO		2	2			3		2	2			2	2	3		2		
COSN			2			2	1	2				2		3	2	2		
WILL*																		
UPSA*								1		2								
SPSA			3			2						1		3	2	1		1
KILL		2	3		3	3	3	1	3	1		3	3	3	1	3		3

	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213
PIPL*																		
SPGR																		
RUGR	3	3	3	2	3	3						3	3	3	3	3		3
RNPH*						1										1		
WITU*													1	1				
RODO			3		1	3		1	1		1		3	3		2		
HODO	1	2	2	1	3	3	1	1	1	1	1	2	2	3	2	3		2
TUVU*																		
NOHA						2						1		1				
SSHA						1												1
COHA*						1												
NOGO				3		1							3	1				
RTHA			2		1	1		1						2				1
RSHA												3		2		3		
BWHA	1		3	1	1	3				1	1	1	3	2	3	3		3
BAEA																		
AMKE		2	2	1	3	3				3	2	3	1	3	3	3		2
OSPR			1			3						1		1				1
LEOW*																		
BAOW		3	2			1								2		2		
NSWO*			2															
GHOW			1			3						1		2		3		
YBCU																2		
BBCU					1				2	1				3		2		
BEKI		1	3		1	2		3	2					2	3	1		3
HAWO	1	3	1		3	3	1		3	1		2	3	2	2	2		3
DOWO		3	3		3	3		1	3	1		2	1	3	2	3		3
BBWO			1															
TTWO*																		
YBSS	1	1	3			2		1	1	3		1	2	2	3	2		2
PIWO	1	1	2			3						1	1	2	1	2		3
NOFL	1	2	2	1	2	3		3	1	1	1	3	2	3	3	3		2
WHIP		2	2			1							2	2		2		
CONI			1		2	3						1						
CHSW	1		2		2	3				1	1	1		3	2	3		1
RTHU		3	2		3	3					1	1	1	2	2	3		1
EAKI		3	2	2	3	3	1	1	3	2	2	2	3	3	3	3		3
GCFL			2	2	2	3	1	2	1	1		3	1	2	2	2		3
EAPH		3	3		3	3	1		3	1		3	3	3	3	3		3
OSFL		1	2			2				1		1	1	2	2	1		3
EWPE	1	1	2		2	3	1	2	1	1	1	1	2	2	2	2		3
YBFL			2	2	2								1		2			
ALFL			2		2			1	1	1		1	2	3	2	2		
WIFL*																		
LEFL	1	1	2	2		2	1	2	1	1	1	1	2	3	2	2		2
HOLA*																		
BLJA	1	2	3		3	3	1	1	1	2	1	1	2	3	2	3		3
GRJA				1														
CORA	1	2	2		2	3		1			1	1	2	2		1		1
AMCR	1	1	2	1	2	3	1	1	3	1	1	1	3	3	1	3		1
EUST	1	1	3	1	3	3		1	2	3	1	3	3	3	3	3		3
BOBO		2	2	1	2	3	1	3	3	2	1	3	2	3	2	2		2
BHCO		1	1	1	3	3	1	1	2	1	1	1	3	3	1	3		3

Appendix E (continued)

	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213
RWBB		2	2	2	2	3		2	3	3	2	3	2	3	3	2		3
EAME		2	2	2	2	3		1	3	1	1	1	2	2	1	2		
OROR*																		
NOOR		3	2	2	3	3	1	1	3	1		3	3	3	3	3		3
RUBL*																		
COGR		2	2	1	3	3	1	1	3	1	1	1	1	3	3	3		3
EVGR	1	1	1		3	1			1			3	2	1		3		
PIGR*																		
PUFI		3	3	2	3	3	1	1	2	1	1	1	2	2	2	3		2
HOFI					3	1										3		
RECK*																		
WWCR*																		
AMGO		3	3	1	3	3	1	2	2	1	1	2	3	3	2	3		2
PISI			2	2														
VESP		2												2				
SASP		3	2			2	1	3	1	1		1	1	2		2		
GRSP*																		
STSP*																		
WTSP	1	2	3	3	3	3	1	1	2	1	1	3	2	3	3	3		2
CHSP	1	2	3	2	3	3		1	3	3		1	2	3	3	3		3
FISP		1	2					1		1				2				
DEJU		1	3	3	2	2			1									3
SOSP	1	2	3	2	3	3	1	2	3	1	3	3	2	3	3	3		3
LISP			2															
SWSP			3		1			2		1	1	2		3	2	1		2
FOSP*																		
RSTO		2			3	2		1		1			2	2				
NOCA		1			2	3										1		
RBGR	1	2	2	2	3	3		1		1		3	2	2	2	3		3
INBU			2			2			1	1				2	1	2		2
SCTA	1	1	1			2	1	1				1	2	2	3	2		3
PUMA*														2		1		
CLSW			3							1	1	3		3		3		3
BASW	1	3	3	3	3	3		2	3	3	3	3	3	3	2	3		3
TRSW		3	3	3	3	3	1	2	3	3	3	3	3	3	2	3		3
BASW			3		3	3		3		1	1	3	3	3		3		
NRWS			1			3									1			
CEWA		3	3		3	3		1	3	1	1	2	3	3	2	3		3
REVI	1	2	3	2	2	3	1	1	2	1	1	1	2	3	2	3		3
PHVI*			1															
WAVI			2		2	2		2	2	1	1	1	2	2		3		
YTVI*																		
SOVI	1		2	2		3		1		1	1		1	2	3	2		3
BAWW			2	2	2	2	1	1	3	1	1	2	2	3	3	3		3
BWWA*																		
NAWA	1		3	2	2	2	1	1	1	2	1	1	2	3	3	3		3
TEWA				2						1					1			
NOPA	1		2	2		2	1	1				2	1	2	1	2		3
CNWA			2	2	2													
YEWA		2	3		2	3	1	2	3	1	1	3	3	3	3	3		3
BTBW	1		2	3	2	2				1		1	1	2	2	2		2
YRWA	1	2	3	2	2	2	1	1	1	1		2	2	2	2	2		3
MAWA	1		2	2	2	2					2		2	3	2	2		3

	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213
CSWA	1	2	3	1	2	3	1	2	3	1	1	1	2	3	3	3		2
BBWA				2	2													
BPWA*				3														
BLWA	1	1	3	2	2	2			1		1			2	2	2		2
BTGW		2	3	3	2	3			1			2	2	2	2	2		2
PIWA			2						1									
PAWA					2			3						1				
PRWA*																		
OVEN	1	2	3	2	2	3	1	2	1	2	1	2	3	3	2	3		3
NOWA	1		2			2	1		2	1		2		2	3	2		2
LOWA*																		
MOWA			3															
COYE	1	2	3	2	2	3	1	2	3	2	1	3	3	3	3	3		3
WIWA			1												3			
CAWA		2	3	2			1			1		2	2	2	3	3		2
AMRE	1	3	3	2	3	3	1	2	2	1	3	1	2	3	3	3		3
HOSP			3		1	3		1	1	1	1	1	3	3	1	3		
WAPI*																		
NOMO		1			3	3		1				1				1		
GRCA		3	3		2	3	1	2	2	2	1	2	2	3	3	3		3
BRTH		1	2		2	3			2	3			2	2		1		
HOWR	1	3	2		3	3		1		1	3	1		2		2		
WIWR	1		2	2		2				1	1	1	2	2	1			2
MAWR												3		3				
BRCR		1	2			2						1		1	1	2		
WBNU	1	1	3		2	3		1						2		3		3
RBNU		1	2	2	2	3				1	1	1	1	3	2	1		1
TUTI*					3											2		
BCCH	1	3	3	2	3	3	1	1	3	2	1	2	3	3	3	3		3
BOCH		3																1
GCKI			1			2								1	2			2
RCKI			2			2						1	2		3			2
BGGN*								1								1		
WOTH	1	3	2	2	2	3	1	2	1	1	1	1	1	3	2	3		2
VEER	1	3	2	3	2	2	1	1	2	2	1	2	2	2	3	3		3
GCTH*		1		2														
SWTH	1		2	3	2													
HETH	1	2	3	2	2	2		1		1		1	1	2	2	2		2
AMRO	1	3	3	3	3	3	1	3	3	3	1	3	3	3	3	3		3
EABL		3	3		3	3						1						

Appendix E (continued)

	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	231
PBGR*					2				1								
COLO	3	1	3		3		1						3	3	3		2
ATPU*																	
BLGU*										1	3						
RAZO*											3						
GBBG										3	3		3				
HEGU										3	3			3	1		
LAGU*									1	1			3				
RBGU*																	
BOGU*																	
COTE										1	1						
ARTE*										1	1						
ROTE*																	
LETE*																	
BLTE*																	
LSPE*																	
GRCO*										1							
DCCO									1	1	3						
COME			3						1					3	1		
RBME*										1					1		
HOME		3					1	1	3	1	2			3			
MALL									3	3			3	1			
ABDU		1	2		3		3	3	3	3	3	1	1	3			1
GADW*																	
AMWI*																	
GWTE					1		3	1	3	3	1						
BWTE									2	1							
NOSH*																	
WOOD		3	2				1	3	3	3							
RNDU			3					1	3	3	2			2			
COGO								1	1	3				3	1		
COEI*										3	3						
CAGO									3	3	3		1	1			
GLIB*																	
AMBI					2		1	2	3	3	2			1			
LEBI*	2																
GBHE			2		1		1	1	1	3	1		1	3	1		1
SNEG*										1							
TRHE*																	
LBHE*																	
CAEG*																	
GRHE										2	1						
BCNH*										1							
VARA*									2	1	1						
SORA*																	
COMU*																	
AMCO*																	
AMWO						3	3	3	3	3	3	2		2	3		
COSN					2	2	2	2	3	3	2	2					2
WILL*																	
UPSA*					3	3	3										
SPSA							1	2	3	3	2			3	2		
KILL			1		3	3	3	3	3	3	3		1	3			

	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	231
PIPL*																	
SPGR							3	3	3	3	3	3		3	3		
RUGR			3		3		2	3	3	3	3	2		3	3		3
RNPH*									2	3							
WITU*																	
RUDU							3	3	3	3	3						
MODO			1		2	2	3	3	3	3	3						
TUVU*																	
NOHA					3	3	2	2	2	3	2	2		1			1
SSHA								3	2	2	2	2	1	2			
COHA*																	
NOGO				3	1		3	2	2	2	1						
RTHA					2				1				1	1	1		
RSHA																	
BWHA					2		3	3	3	3	2	1		1	1		2
BAEA	3	3						1	3	3	2			1			
AMKE			3		3	2	3	3	3	3	3	1					3
OSPR			3	3	1	1	3	3	3	3	3	1	3	3	2		
LEOW*										3							
BAOW							2	2	2	2	2		2	3	2		2
NSWO*									1	1					2		
GHOW							2	2	3	3	2				1		1
YBCU					2	2											
BBCU					3	3	2	2	2	1	2						
BEKI			3					3	2	3	3		1	3	3		
HAWO		1	2		3		2	3	3	3	3	2	1	3	1		3
DOWO		1	3		2	3	2	3	3	2	2	2	3	2	1		3
BBWO							3	3	3	3	3		2		1		
TTWO*															1		
YBSS		1			2	1	2	3	2	2	2		2	2	3		3
PIWO					3		1	3	2	2			1	1	2		2
NOFL		1	1		2	3	3	3	3	3	3		2	3	3		1
WHIP			1		2	2	2	2	2	2	2	3					2
CONI					2	2	2	3	3	3	2	2					
CHSW			3			1	3	3	3	3	3		2	1	1		1
RTHU			1			2	3	2	3	3	3	3	1	1	1		3
EAKI		1	2		3	3		2		3	3	3	2	3			2
GCFL			1			1			2	1			1	2	1		3
EAPH		1	1			3	3	3	3	2	3			3			3
OSFL					1	1		2	2	2	3	2		2	1		
EWPE			1		2		2	2	3	2	2	2	1	2	1		
YBFL					2		2	3	2	3	2	2		1	2		
ALFL					2	2	2	2	3	3	3	2	1				
WIFL*									3								
LEFL					2	2	2	2	3	2	2	2	2	2	1		3
HOLA*					2					1							
BLJA		1	3		2		2	3	3	3	3		1	1	1		3
GRJA							3	3	3	3	3			2	1		
CORA		1	1		3	2	3	3	3	3	3	2	1	3	1		
AMCR		1	3		3	2	3	3	3	3	3	2	2	2	3		
EUST		1	1		3	3	3	3	3	3	3		3				3
BOBO		1	2		3	3	3	3	3	3	2	2	2				
BHCO		1	1		1	1	1	2	3	2	3		1				1

Appendix E (continued)

	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	231
RWBB		1	2		3	3	3	3	3	3	3	2	3	2	1		3
EAME		1	1		3	3	3	2	3	3		2					
ORDR*																	
NOOR			3						3				2		1		3
RUBL*														1			
COGR		1	2		3	3	3	3	3	3	3		3	3	3		1
EVGR			1		1	1	3	2	3	2	3	1	3	2	2		
PIGR*																	
PUFI			1		3	2	2	3	3	3	3	2	2	3	2		3
HOFI																	
RECR*								1		2	2						
WWCR*						2		2	2	1	2						
AMGO		1	1		2	2	3	2	3	3	3	2		3	1		3
PISI						1	2	2	2	2	3	1	1	2	2		
VESP					3	3	3	3	2	2	1						
SASP			2		3	3	3	3	3	3	3	2		3			
GRSP*																	
SISP*									3	3	1						
WTSP		1	3		3		3	3	3	3	3	3	3	3	3	3	3
CHSP		1	2		3	3	3	3	3	3	3		3	3	3		2
FISP			1		3	2	2	2		1							
DEJU					3	3	3	3	3	3	3	2	3	3	3		
SOSP		1	3		3	2	3	3	3	3	3	3	2	3	2		2
LISP			2		2	3	3	3	3	3	3	3	2				
SWSP					2	2	3	2	3	2	3	3	2	2	1		3
FOSP*																	
RSTO			1		3	2	2		2	2		1					
NOCA									2	1	2						1
RBGR		1			3	2	2	3	3	2	3	2	2	3	2		2
INBU			1		3		3		3		1		1	3			1
SCTA		1	2		3		2	2	1	1	2						2
PUMA*									3								
CLSW		1		2	3	1	3	3	3	3	3	1		3			1
BASW		1	3		3	3	3	3	3	3	3	3	3	3	1		3
TRSW		1	3		2	3	3	3	3	3	3	3	3	3	3		3
BASW			3	3	3	3	3	3	3	3	3	1	1	3	3		
NRWS						3			1								
CEWA		1	1	2	3	3	3	3	3	3	3	2	2	3	1	2	3
REVI		1	2		3	3	3	3	3	3	3	2	3	2	2	2	
PHVI*																	
WAVI		1							2		1			1			3
YTVI*																	
SOVI		1	2		3	3	2	3	3	3	3	2	1	3	3	2	3
BAWW		1	2		2	3	3	3	3	3	3	2	3	3	1		2
BWWA*																	
NAWA		1	3		2	3	3	3	3	3	3	2	3	3	3	2	2
TEWA			2		3		3	3	3	3	3		3	2	2		
NOPA		1	2		2	2	2	3	3	3	3	2	2	2	3	2	
CMWA							2	3	3	3	3		1	3	2	2	
YEWA		1	2		2	2	3	2	3	3	3	2			1		3
BTBW			3		3		1	3	2	1	2		2	2	2	2	1
YRWA		1	2		2	2	3	3	3	3	3	2	3	3	3	2	3
MAWA			3		3		3	3	2	3	3	2	3	2	3	2	2

	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	231
CSWA		1	2		3	2	2	3	3	2	2	2	2	2	3		3
BBWA							2	3	2	3	3			2	2	2	
BPWA*										2					2		
BLWA					2		2	3	3	3	3		3	3	3	2	1
BTGW		1	3		3	2	3	3	3	3	3	2	1	2	2	2	2
PIWA			1											2			
PAWA			1		3	3		3	3	3	3	3					
PRWA*																	
OVEN		1	2		3	3	2	3	3	3	3	2	2	3	2	2	3
NOWA			3		1		1	2	2	2	2	2	1	2			
LOWA*																	
MOWA									2		1			2	3		
COYE		1	3		3	3	3	3	3	3	3	3	3	3	3		2
WIWA					3	3	1	3	3	3	3	3					
CAWA		1	3		2	2	3	2	3	3	3		3	3	2		1
AMRE		1	3		3	3	2	3	3	3	3	2	2	3	1		3
HOSP			3			2	3	3	3	3	3						
WAPI*																	
NOMO			1			2	3	1	3		3						2
GRCA		1	1	1	3	2	3	3	3	3	3	2	3	1	2		3
BRTH					3	3	3	2	3	3	1	2					1
HOWR							3						3				3
WIWR		1	2		3	2		3	3	3	3			3	2	2	1
MAWR											2						
BRCR							3	3	2	3	1			2	1	2	
WBNU		1								1				2			1
RBNU						1	3	3	3	3	1		2	3	3		
TUTI*																	
BCCH		1	3		3	2	1	3	3	3	2	2		2	1		3
BOCH						2	3	3	3	3	3	2	3	3	1		
GCKI			3			2	2	3	2	3	3	2		2	3		
RCKI			2		2	2	2	3	2	3	3	2	2		2		3
BGGN*																	
WOTH		1	1		2	2	2	2	3	3	2	2		2			3
VEER		1	1		2	2	2	2	2	2	2	2	2	2	2		2
GCTH*																	
SWTH		1			1	2	2	3	3	3	3	2	2	3	3	2	
HETH		1	1		3	3	3	3	3	3	3	2	3	2	2		2
AMRO		1	1	2	3	3	3	3	3	3	3	3	3	3	2		3
EABL						1	3		1	1	3						3

Appendix E (continued)

	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249
PBGR*			2					3	3									
COLO	2	3	3				3	3	3	3	3	3		3	3	3		2
ATPU*																		
BLGU*																		
RAZO*																		
GBBG																		
HEGU																		
LAGU*													1					
RBGU*																		
BOGU*																		
COTE																		
ARTE*																		
ROTE*																		
LETE*																		
BLTE*								3	3									
LSPE*																		
GRCO*																		
DCCO								1				1	1					
COME	3	1		1					1									3
RBME*																		3
HOME				3			3	3	3			3	1					
MALL	1	3				3	3	2							2			
ABDU	1	3	3			1		3	3			3	3	1	3			3
GADW*																		
AMWI*																		
GWTE									3			1	3					
BWTE							1	3	1			2	3					
NOSH*																		
WODU	3	3	3	3	1	1		3	3			3	3		3	2		3
RNDU		3	3					1	2			2	2			2		1
COGO									3									1
COEI*																		
CAGO		1							3		3		3					
GLIB*																		
AMBI	2	1		2		2	1	2	1			2	2	2	2			
LEBI*								2										
GBHE	1	1	2	1	3	1	1	1	1		1		1	3	1			2
SNEG*																		
TRHE*																		
LBHE*																		
CAEG*																		
GRHE	1		1		1							3	3	1				
BCNH*					2													
VARA*								2				3	3					
SORA*								2	1			3	3		3			
COMU*								3				2						
AMCO*								3										
AMWO	2	3	1	2		3		1		2		2	3		1	2	1	3
COSN		2	1			2	2	2	2		2	2	3	3	2			
WILL*																		
UPSA*				3									3					
SPSA	3			1	1			3	1			2	2	2	2	3		3
KILL	3	3	2			3	1		1			3	3	3	1	3	1	

	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249
PIPL*																		
SPGR															3			3
RUGR	3	3	3	3		3	1	1	3			3	3	3	3	3		3
RNPH*												2	2	3				
WITU*																		
RODO	3	1		3		3			1		1	3	3	3		3		
MODO	2	1	3	2	1	3	1		2			2	2	3	2	2		1
TUVU*						1												
NOHA						1		2	2			2	1	1	1			
SSHA		1						1	1			1	1	1	3	1		1
COHA*			1															
NOGO		1						3	3						1			
RTHA	2	1	1											1		1		
RSHA			1			3								2	3			1
BWHA		1		3		2	1	3	3			2	2	3	2	2		1
BAEA			1												1	1		2
AMKE	2	2	2	1	2	3	2	1	2		2	3	3	3	3	3	1	2
OSPR												2	1	1	1			1
LEOW*																		
BAOW		2		2	2			2	2				2		1	2	1	2
NSWO*												1						
GHOW	1	3	1										3	3				1
YBCU													2		2			
BBCU		2	2			2	1					2	2	2	2	3		
BEKI	2	2	2	3		3		2	1			3	3	3	2	3	1	3
HAWO		3	3	3		3			2			2	3	2	3	2	1	2
DOWO		3	3		3	3	1	1	2			2	3	2	2	3	1	2
BBWO													1		3			2
TTWO*																		
YBSS	3	1	3	1		3	1		3			2	3	1	3	2	1	2
PIWO	3	2	1		1	2			2			1	1	1	2	2		2
NOFL	3	3	2	2		1	1	3	2			3	3	3	3	1	1	2
WHIP	2	2	2	2		2							2	2				
CONI		2	2			3			3				3	2	1		1	3
CHSW	3	2	1	1	1	2	1	1			1	1	3	3	2	1		1
RTHO	2	2	3	1	1	2	1		1			2	3	2	1	1		1
EAKI	3	2	3	1	1	3	1	3	2		2	3	3	3	3	1	1	3
GCFL	1	2	2	2		2	1	2				1	3	3	2	3	1	2
EAPH	3	3	3	3	3	3	1	2	2			3	3	3	2	3	1	1
OSFL		2		2		1							2		2	2		2
EWPE	2	2	2	2	1		1	2					2	2	2	2		2
YBFL													1	2	2	2		2
ALFL	1	2				1	1	2				2	2	2	3	1	2	
WIFL*														2	1			
LEFL	1	2				2	1	2				2	3	2	2	2	1	1
HOLA*													3					
BLJA	3	3	3	2	1	3	1	2	3			3	3	3	2	2	1	3
GRJA															3			3
CORA	1	1	3	2		1	1	2					3	3	2	3	1	3
AMCR	3	3	3	2	1	3	1	2	1			3	3	3	3	3	1	3
EUST	3	3	3	1	3	3			3		3	3	3	3	3	3	3	3
BOBO	2	2	3			2	1	2	2		2	2	3	3	2	3	1	
BHCO	3	2	3	1		3	1	1	1			3	3	3	2	2	1	2

Appendix E (continued)

	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249
RWBB	2	3	3	2	2	2	2	3	3		2	3	3	3	3	3	2	2
EAME	2	2	1	2		2	1	2				3	3	3	2	1	1	
DROR*																		
NOOR	3	2	3	3	3	3	1	3	3		3	3	3	3	3	3		2
RUBL*																		
COGR	3	2	3	1	1	3	3	3	2		3	3	3	3	3	3	1	1
EVGR		1	2	3		3						1	3	3	2	1	1	1
PIGR*																		
PUFI	2	3	3	1	1	3	1	1				3	3	2	2	3	2	3
HOFI				3									3					
RECR*															1			
WWCR*															1			
AMGO	2	2	3	3	3	3	1	2				3	3	3	2	1	1	
PISI	1		2												2	1	1	
VESP												1	2					
SASP	2	2		2		3	1	2				2	2	2	3	1	1	
GRSP*																		
STSP*						3												
WTSP	2	2	3	2		3	1		2		2	3	3	3	3	3	1	3
CHSP	3	2	2	3		3	1	3	2			3	3	3	3	3	2	2
FISP		3				1							2				1	
DEJU		2	1					2	2				3		3	3	1	3
SOSP	2	2	3	3	1		1	3	3		2	3	3	3	3	3	2	
LISP														2	3			
SWSP	2			2		2		2	2			3	3	2	3	1	2	
FOSP*																		
RSTO		1	2	1		1	1											
NOCA	3	1	2										3	3				
RBGR	2	2	2	1	1	3	1	2	2		2	3	3	3	3	3	1	2
INBU	2	1	2	2		2					1	3	3	2			1	
SCTA	2	2	2	1		2	1					2	3	2	2	3	1	1
PUMA*								1	3				3					
CLSW	3	1		1			1	1				3	3	3	3	3	3	
BASW	3	3	3	3	3	3	1	3	3		3	3	3	3	3	3	3	3
TRSW	3	3	3	3	3	3	1	3	3		3	3	3	3	3	3	3	3
BASW	3	3	2	3		3	1	3	3			3	3		2	3	3	
NRWS				3		3		1	1			1	3	3				
CEWA	3	3	2	3	1	3	1	1	1			3	3	3	3	3	1	2
REVI	3	2		3	1	2	1	2	2			2	3	3	3	3	1	2
PHVI*			1															
WAVI		2	2	2		2	1	2				2	3	3				
YTVI*																		
SOVI		2		1		2	1					2	2		2	2	1	2
BAWW		2	1	3		3	1	2	1			2	3	3	3	3	1	2
BWWA*																		
NAWA	1	3		2		2	1	2	1			2	2	3	3	3	3	2
TEWA													2	2	2	3	2	2
NOPA	3	2	1	2		2	1		2		2	2	2	3	2	2	1	2
CMWA						1	1								2			2
YEWA	2	2	3	3	1	3	1	3	1			3	3	3	3	2		
BTBW	1	2		1		1						2	2	2	3	2	1	1
YRWA		2	1	1		3	1	2	1			2	3	3	3	3	2	3
MAWA	1	2	3	1		2			1			2	3	3	3	2	1	2

	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249
CSWA	2	2	3	3	1	2	1	2				3	3	3	2	2	1	
BBWA			3												2	2		
BPWA*																		
BLWA												2	2	1	2	2	1	2
BTGW		2		1		2	1					2	3	3	3	3	1	2
PIWA												2	2	2	2	2	1	
PAWA													3	3	3		2	3
PRWA*																		
OVEN	2	2	2	2		3	1	2	2			2	3	3	3	2	2	2
NOWA		2		1	1			2	2			2	3	1	3	3	1	
LOWA*																		
MOWA																		
COYE	1	2	2	3	3	2	1	3	3			2	3	3	3	3	3	3
WIWA								2				3	1	3	3	1		
CAWA		2				2	1				2	2	2	2	3	2		2
AMRE	3	2		3		2	1	2	2			2	3	3	2	2	1	
HOSP	3	1		3	1	3	1	3	3		3	3	3	3		3		
WAPI*																		
NOMO		1	2	3		3			3			3	3	2				
GRCA	3	3	3	3	2	2	1	3	1			3	3	3	2	2	1	3
BRTH	2	2	3				1	2	1			2	3	3	2		1	
HOWR		2	2	3		1	1		2				2			3		
WIWR	1	2		2		2	1					1	2	1	3	3	1	2
MAWR								3	2			2	2		3			
BRCR	1		1			1			2			1	3		2	2		
WBNU		3	3			3			2					1	1	3		1
RBNU	2	2	1			3	1		1			1		1	3	3		2
TUTI*													3	1	1			
BCCH	3	2	3	2		3	1	2	3			3	3	3	3	3	1	3
BOCH															2			3
GCKI						3	1					2	2		3	3		2
RCKI		2				2	1						2		2	2	1	2
BGGN*																		
WOTH	3	2	2	2		2	1		3			2	3	2	2	2	1	
VEER	3	3	3	2	1	2	1	2			2	2	3	3	3	2	1	1
GCTH*																		
SWTH													2		2	1	1	
HETH		2	2	2		2						2	2	1	2	2	1	3
AMRO	3	3	3	3	3	3	1	3	1			3	3	3	3	3	3	3
EABL	3	1	2											3		3	3	

Appendix E (continued)

	250	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267
PBGH*				1												
COLO			2	3		1	1			3	3	3	3			
ATPU*																
BLGU*								1								
RAZU*																
GBBG								1								
HEGU								1		3	3	1	1			
LAGU*										1		1				
RBGU*																
BOGU*																
COTE											1	1	1			
ARTE*								1								
ROTE*								1								
LETE*																
BLTE*																
LSPE*																
GRCO*								2								
DCCO																
COME									3	3	3	3				
RBME*								1			3					
HOME							2		3			2				
MALL							3	1		1	3	3				
ABDU			1		2	3	3	3	3	3		3				
GADW*																
AMWI*																
GWTE					2	3	2	3	3	3						
BWTE					2		2	3								
NOSH*																
WODU							2	1	3	3						
RNDU					2	1	1	3				2				
COGO																
COEI*						1		1								
CAGO						1	3									
GLIB*																
AMBI			2	2	2	2	2	2				1				
LEBI*																
GBHE						1	3	1	1	3	1	3				
SNEG*																
TRHE*																
LBHE*																
CAEG*																
GRHE					1	1	1	3								
BCNH*						1	3									
VARA*					2	1	2									
SORA*						1										
COMO*																
AMCO*																
AMWO	2	3	2	3	2	2	3	1	3	2				1		
COSN			1	2	3	2	2	3	3	1		1		1		
WILL*																
UPSA*		3	3													
SPSA				2	3	3	3	3	1	3						
KILL	1	3		3	3	3	3	3	3	2	3				1	1

	250	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267
PIPL*																
SPGR	2	3				3	3	3	3	3	3	3	1			
RUGR	2		3	3	2	3	3	3	3	3	3	3				1
RNPH*																
WITU*																
RODO						1	1	1								1
MODO	3	2	2	3	2	2	3	3	3			2	2			1
TUVU*																
NOHA	1			2		1	3	3				1				
SSHA		1		2	1	3	3	1			2					
COHA*							1									
NOGO	2			1	2	3	3	1								3
RTHA											1	2				
RSHA																
BWHA	3	3	1	3	3	1	3	1	1	1	1		1			1
BAEA	3			3	3	3	3				1					
AMKE	1	3	1	3	3	2	3	3	1	1		2			1	3
OSPR				1	1	3	3	3			1	3				
LEOW*																
BAOW	1			3			2	2	2	1						1
NSWO*																
GHOW						3		2	1							1
YBCU	1															
BBCU	2	2	2	2	2	1	3	2								
BEKI		3		1	3	2	3	2	3	3	3	3				3
HAWO	3	2	2	3	2	1	3	3	2	3	3	3	2			3
DOWO	3	2	1	2	2	2	3	3	2	3	3	3		1		3
BBWO	3	3		3		3	3	2	1	1	3	3				
TTWO*																
YBSS	3		2	3	2	2	1	3	2	3	2	2		1		3
PIWO	2		2	2	3	1	3				1	2		1		1
NOFL	3	3	2	3	3	2	3	3	1	3	1	2		3	1	3
WHIP		2	1	2	2	2	3	2								
CONI	2	2	1	2	2	2	2	2								
CHSW	2		1	3	2	1	1	3	3	1	1		1			
RTHU						1	3	3		1	1	3		2	1	3
EAKI	3	3	2	2	3	2	3	3	3		3	3		1		3
GCFL			1	2			1	3	1	1		2				1
EAPH	2	3		3	3	3	2	3	1	1				3		3
OSFL	2	2		2	2	2	1	2	3		1	3	2			
EWPE	2	2	1	2	2	2	2	3	2	1	1	3				
YBFL	3	2		1	2	2	2	3	2	2	1	2		1		
ALFL	2	2	2	2	3	2	3	3	2	2	1	2	1			1
WIFL*																
LEFL	2	3	2	2	3	2	2	3	2	2	2	3	1			1
HOLA*																
BLJA	3		1	2	1	3	3	3	3	1	1	3		1	1	3
GRJA		3		2	1	1	3	3		1		3				
CORA	3	3	1	3	3	2	2	3	3	1	1	1				3
AMCR	3	3	1	3	3	3	3	3	3	1	1	3		1		3
EUST	3	3	3	3	3	3	3	3		3	3	3		1		3
BOBO	3	3		3	3	3	3	3	2		1	2				3
BHCO	1	1	3	2	3	2	3	2	1			1		3		1

Appendix E (continued)

	250	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267
RWBB	3	3	3	3	3	3		3	3	3	3	2		1		3
EAME	3	3			1	2	3	2					2			1
OROR*																
NOOR						2		1	3					2		
RUBL*				3						2						
COGR	3	2	3	3	3	3	3	3	3	3	3	3	2	1	1	3
EVGR	2	3	2	2	2	3	2	3	2	2	1	3	1	1		1
PIGR*									2	2				1		
PUFI	2	3	2	3	3	3	3	3	3	2	1	3	1	1		1
HOFI																
RECR*																
WWCR*		2	2	2	2	2		2								
AMGO	1	3	2	3	2	3	2	3	1	1	1	1		1		1
PISI	2	2	2	1	2	1	2	3	2	2	1	3	2			
VESP	3	2	2	2	2	2	1	1						2		
SASP	3	3	2	2	3	3	3	3	2			2				3
GRSP*								3								
STSP*							3	3								
WTSP	3	3	3	3	3	3	3	3	3	3	3	3	2	2	1	1
CHSP	3	3	3	3	3	3	2	3	3	3	3	2		1		3
FISP	2	1	2		1	2	2	2								
DEJU	3	3	3	3	3	3	3	3	3	3	1	3	1	1		1
SOSP	3	3	3	3	3	3	3	3	3	3	2	3		2		3
LISP	3	3		2	2	3	3	3	3	3	3	3				
SWSP	2	2	2	3	3	3	3	3	2	2	2	3				1
FOSP*																
RSTO	2					1		1								1
NOCA							2									
RBGR	3	3	2	3	3	2	3	2	3	2	2	3	2			1
INBU	2			2	2			1		1	3	1				
SCTA	3	2	2	3	1	2	1		2	2	1	1				3
PUMA*																
CLSW	3	3	3	3	3	3	3	3	3	3	3	3	1		1	3
BASW	3	3	3	3	3	3	3	3	3	3	3	3		3		3
TRSW	3	3	1	2	3	3	3	3	3	3	3	3	1	3		3
BASW	3	3	3	3	3	3	3	3	3	3		1	3			3
NRWS			3					1								
CEWA	3		2	3	3	3	3	3	3	3	2	3		1		1
REVI	3	3	2	3	3	2	3	2	3	2	2	2		1		1
PHVI*										1						
WAVI				2				2								1
YTVI*																
SOVI	3	3	3	3	3	2	3	3	2	3	2	3				1
BAWW	3	3	3	3	3	3	2	3	3	1	1	2	1			1
BWWA*																
NAWA	3	3	2	3	3	3	3	3	3	2	3	2	2			1
TEWA	3	3	1	3	3	3	3	3	3	2	2	3	2	1		
NOPA	3	3	2	3	3	3	2	3	3	3	2	3	2			1
CMWA	2	2	2	2	2		2	2	3	2	1	2				
YEWA	3	2	3	3	3	3	3	3	2	1		2				1
BTBW	3	2	3	1	2	2		2	3	2	1	2		1		1
YRWA	3	3	3	3	3	3	3	3	3	3	3	3	2	1		
MAWA	2	3	2	3	2	3	3	3	3	3	3	3				

	250	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267
CSWA	3	2	3	3	3	3	3	3	2	3	3	3				1
BBWA	3	3	2	3	3	3	2	3	3	3	2	2				
BPWA*							2	2	3			3				
BLWA	3	3	2	3	3	3	2	3	3	3	2	2				
BTGW	3	3	2	3	3	3	3	3	1	3	3	2	2			
PIWA	2	2						1		2	2					
PAWA	2	2	2		2	1	3	3	2			2				
PRWA*																
OVEN	3	3	3	3	3	3	3	3		2	1	3		3		1
NOWA	1	2	2	2	2	2	3	2	3	3	3	3	2			1
LOWA*																
MOWA	3	1	2			2	3			3	1	3	1			
COYE	3	3	3	3	3	3	3	3	3	3	3	3	2	2		2
WIWA	3	3	2		2	3	3	3								
CAWA	2	1	3	3	2	2	3	3	3	3	3	3		1		
AMRE	3	3	2	2	3	3	3	3	3	3	2	2	1	1		1
HOSP	1				1	3	3	3				3				3
WAPI*																
NOMO							3	3								
GRCA	3	2	3	3	3	3	3	3	1	1	2	3		3		3
BRTH	3			3	2	1	2							1		3
HOWR				2			3				3			3		
WIWR	3	2	1	2	2	3	3	3	2	3	1	3				1
MAWR																
BRCR	2	2				2		2	2	2	1	1				
WBNU	2							1				3	1			2
RBNU	2		1	3	2	1	3	3	3	3	2	3	2			2
TUTI*																
BCCH	2	3	1	3	3	3	3	3	3	1	3	3	2	3	1	3
BOCH	2	3		3	2	3	3	3		2		1				
GCKI	2	3	2	3	3	2		3	3	2		2				1
RCKI	2		2	2	2	2	3	3	2	2	2	2				
BGGN*																
WOTH	2	2	2	2	2	2	2	2		1		1		2		1
VEER	2		2	2	2	3	2	2	2	2	2	3	1	2		1
GCTH*								1		1						
SWTH	2	3	2	2	3	2	3	3	2	2	2	3				
HETH	3	2	2	3	3	3	2	3	3	2	1	2	2	2		1
AMRO	3	3	3	3	3	3	3	3	3	3	3	3	2	3	1	3
EABL				3			3	3	3							3

Appendix E (continued)

	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285
PAGR*							2	2				2	2					
COLO	2	2	2			3	3	2	3		3				1	3	1	
ATPU*																		
BLGU*																		
RAZO*																		
GRBG																		
HEGU			1				1	1			1		1					
LAGU*																		
RBGU*																		
BOGU*																		
COTE																		
ARTE*																		
ROTE*																		
LETE*																		
DLTE*								1										
LSPE*																		
GRCO*																		
DCCO											1	1						
COME							3	3			1		1			1		
RBME*																	3	
HOME	3		1				3	3					3					
MALL	1						1	3			1		2					
ABDU	3	3	3				3	3		1	3	3	3			1		
GADW*																		
AMWI*							2	3										
GWTE	1										1		3					
BWTE							3	2					3					
NOSH*																		
WODU	3	3		3			3	3			2	2	3		1		3	
RNDU	1	3					2	2			1		3			1		
COGO							3	3				3				3		
COEI*																		
CAGO		3					3	3	3									
GLIB*																		
AMBI	1						1	2			3	2	2					
LEBI*																		
GBHE	1	1	1	1			1	2		1	2	1	1			1		
SNEG*																		
TRHE*																		
LBHE*																		
CAEG*																		
GRHE				1						1	2		1					
BCNH*																		
VARA*												2	2					
SORA*		2					2											
COMO*																		
AMCO*																		
AMWO		1	2		2	2						3	3					
COSN		2		1				1		1	2	2	3					
WILL*																		
UPSA*																		
SPSA			3				1	2			2	2	2			1		
KILL		2	3	3	1	1	3	3		3	3	3	3				3	

	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285
PIPL*																		
SPGR											1		2			1		
RUGR	3	3	1				3	1		2	1	3	3			1		
RNPH*												2						
WITU*																		
RODO	1	1	1	1	2	3	2	1	3	3	1	3						
MODO	2	3	2	1	2	3	2			3	2	2	2					
TUVU*																		
NOHA		1						1			2	1	3			1		
SSHA	3												2					
CUHA*													1					
NOGO		1									1	1	1					
RTHA											1							
RSHA		2											2					
BWHA	1	3	1	1	2	1					1	2	2			1		1
BAEA																		
AMKE	1	3	2	1	2	3	1			2	1	3	1		1			
OSPR		2						1			1		3			1	3	3
LEOW*													3					
BAOW		2	2	1							3	2	1			1		
NSWO*																		
GHOW		2									3	1				1		
YBCU												2	2					
BBCU				1			1			1	1	2	2			1		
BEKI	1	3	3	1	2	2	2				2	3	3		1	1	1	
HAWO	3	3	2		1	1	1			2	3	2	3		1			
DOWO	1	3	3	1		1	1			2	3	3	3					
BBWO													3				2	2
TTWO*																		
YBSS		2	3		1	1	1			3	3	3	3		1	1	1	
PIWO		2	2			1	1			2	2	2	3			1	2	2
NOFL	3	2	2	1	1	2	2			3	2	3	2		1	1		
WHIP	2	2	2	2							2	2	2			1		
CONI					1						2	3	2			1		1
CHSW	2	3	1	2	1	1	1	1	3	1	3	2						1
RTHU		2	1			2	3				3	1	1		1			
EAKI	3	3	2	2	1	2	3			3	3	3	3		3	1		
GCFL	2	2				3	2			2	2	2	2					
EAPH	2	3	2	1	1	3	3			3	2	3	3		1	1		
OSFL	2						1			1	1	2			1			
EWPE		2	2		1	1	2			2	2	3			1			
YBFL										2	3		2	1			2	2
ALFL	2		2	1	1	2	2			2	2	3	2					
WIFL*										2	1		1					
LEFL	2		1	1	1	2	2			2	3	2			1			
HOLA*																		
BLJA	3	3	3	1	1	1	2			3	2	3	2		1	1	2	2
GRJA			1								1	1	3			1	3	
CORA	1	2	2	1		1				1	2	3	3			1	1	2
AMCR	1	3	3		1	3	3	1		3	2	3	1		1			
EUST	3	3	3	3	3	3	3	3		3	3	3			1			
BOBO	3	3	2	1	2	2	1	3		2	2	3	3		1			
BHCO	1	2	2	1		1	1			2	3	2	2		1			

	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285
RWBB		2	3	3	1	3	3	3	2	3	3	3	3		1			
EAME		3	3	2		1	2	2	2	2	2	2						
OROR*																		
NOOR		2	3	3		3	3	3	2	3	3	3	3					
RUBL*													1					
COGR		2	3	3	3	1	3	3	3	3	3	3	3		1			
EVGR		1	1		1					1	1	3	2		1		2	2
PIGR*																		
PUFI		3	3	3	1	1	1	2		2	3	3	3	1	1			
HOFI			1															
RECR*																		
WWCR*													1					
AMGO		1	3	3	2	1	1	2	3	3	2	3	2					
PISI											1	3	2					
VESP										2								
SASP		3	2	2	1	1	2	1		2	1	3	3	1				
GRSP*																		
STSP*																		
WTSP		2	3	2	2	1	2	2	2	3	3	3	3	1	1	1	2	2
CHSP		2	3	3	3	1	2	2		3	3	3	2		1			
FISP		1					1			2	1	2						
DEJU			3							1	1	2	3				1	1
SOSP		3	3	3	2	1	3	3	2	3	3	3	3		1			
LISP											2	2	3	1				
SWSP		2		2			2		3	2	2	3	3	3		1		
FOSP*																		
RSTO		2										1						
NOCA											1	1						1
RBGR		2	3	1	1	1	2	3	2	3	3	3	3		1		2	1
INBU							1	1		1	1	2						
SCIA		2	2	2		1	1			2	2	2	2		1			
PUMA*			3	1			3	3			3	3						
CLSW		3	3	3	3			1		3	2	3	1		1			
BASW		3	3	3	3	3	3	3		3	3	3	3		1	1		
TRSW		1	3	3	3	1	3	3	3	3	3	3	3		1	1		
BASW			3		1					1	3	3	1					
NRWS										1		3	1					
CEWA		2	3	3	1	1	1	2	1	3	2	3	3		1			
REVI		3	3	3	2	1	2	3		3	3	3	2		1	1	2	2
PHVI*											1		1					
WAVI		1	2	2	2	1	1	2		2	2	2	2					
YTVI*													2					
SOVI		3	2	3	1			1		1	3	2	3		1	1	2	1
BAWW		3	2	2	1	1	2	3		3	3	3	3		1	1	2	
BWWA*																		
NAWA		3	3	1	1	1	1	2		2	2	2	3	1	1		2	2
TEWA											1		2				2	2
NOPA		2	2	1	1	1	2	2		2	2	2	3		1	1	2	2
CMWA			1		1						1		3				2	
YEWA		2	2	3		1	2	3	2	3	3	3	3	1	1			
BTBW		1	2	2							2	2	2		1	1		
YRWA		3	3	1	1	1	2	3		2	3	3	3	1	1	1	2	2
MAWA		2	2	2	1	1	1	3		2	2	2	3	1	1	1		

	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285
CSWA		3	3	2	1	1	2	2	1	2	2	3	3		1		1	
BBWA			1	1									3				2	1
BPWA*																		
BLWA		1	1							2	2	2	3		1		2	2
BTGW		2	2	2			2			1	2	3	3		1	1		2
PIWA			2							3	2	3	2		1		1	2
PAWA											3	2	3	1		1		
PRWA*																		
OVEN		3	3	2	1	1	2	2	2	2	2	2	3		1	1	2	2
NOWA		2	2	3	1	1	2			2	2	2	3	1		1		
LOWA*																		
MOWA			2				1					1	1			1		
COYE		3	3	3	1	1	2	3		3	3	3	3	3	1	1	2	2
WIWA											3		3	1				
CAWA		3	3	2	1	1	1	2		2	2	3	3	1	1		2	2
AMRE		3	3	3	1	1	2	3		2	2	3	3		1		1	1
HOSP		3	3	3		1	3	3		3	3	3						
WAPI*																		
NOMO		1					3				2	3						
GRCA		1	3	3	1	1	2	2		2	2	3	3		1			
BRTH			3		1	1	1	2		1	2	2				1		
HOWR										3		3						
WIWR			2	1	1		2	2		2	2	2	3		1		2	2
MAWR		2					2						1					
BRCR			2								3	2	2				2	1
WBNU		1	3									1	1				1	2
RBNU		3	3	2	1		1			1	1	2	2		1		2	2
TUTI*			2															
BCCH		1	3	2	1	1	2	2	1	2	3	3	2	1		1	1	2
BOCH												1	2				2	2
GCKI										1		1	3		1			
RCKI		1			1						1	2	2				2	2
BGGN*																		
WOTH		2	3	2	1	1	1	2	2	2	2	3	2		1	1		
VEER		2	3	3	2	1	2	2		2	2	2	3		1	1		
GCTH*																		
SWTH												2	2		1		1	3
HETH		2	2	2	2	1	1			1	1	2	3		1	1	2	3
AMRO		2	3	3	3	3	3	3	2	3	3	3	3		1	1		
EABL			3	3			1					1						

Appendix E (continued)

	287	286	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303
PBGR*						1			3	3							
COLO	2		2	2	1	2	3	2	3	3				1		3	1
ATPU*																	
BLGU*						1											
RAZO*																	
GBBG					1	3											
HEGU					1	3	1		3								
LAGU*								1									
RBGU*																	
BOGU*																	
COTE						1											
ARTE*						1											
RUTE*																	
LETE*																	
HLTE*																	
LSPE*																	
GRCO*																	
DCCO					1	3										1	
COME							3	3	3		1					3	
RBME*																	
HOME							3		3	3	3						
MALL						1			1								
ABDU	2				1	3	3	3	3	2							
GADW*																	
AMWI*																	
GWTE						2	3	3	3								
BWTE						2											
NOSH*																	
WOOD	3						3	3	3							1	
RNDU					3			3	3	3	1						
COGO						1	3	3	3	3							
COEI*						3											
CAGO																	
GLIB*																	
AMBI	2					1	2	2	2	1	2						
LEBI*																	
GBHE	1				1	2	2	1	1	3							
SNEG*																	
TRHE*																	
LBHE*																	
CAEG*																	
GRHE					1	1											
BCNH*						2											
VARA*																	
SORA*						3											
COMO*																	
AMCO*																	
AMWO	3				3	1	3	3	3					1		2	
COSN	2				3	3	2	2	2	2	2	2					
WILL*																	
UPSA*																	
SPSA					3	3	3	3	3		2						2
KILL	3		2		3	3					3				1	3	2

	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303
PIPL*																	
SPGR	2			3	3	2	3	3	3		3						
RUGR	3		2		3	3	3	3	3	2	2	2			1	3	
RNPH*																	
WITU*																	
RODO			3		3	3					1					1	
MODO	2		3		3	2							1		1	1	2
TUVU*																	
NOHA	1			1	1	2											
SSHA	2		1		3	2	1	1	2								
COHA*					1	2			1								
NOGO					2	1	2	1	1								
RTHA					1	2	2		1								
RSHA																	
BWHA	1		2	2	2	2	3	2	2		1					3	2
BAEA		3		3	3	3											
AMKE	1		1		3	3	2		1		1						1
OSPR	3	3		3	3	3		1	1							1	
LEOW*																	
BAOW	2		1		1	1	2		1	1							
NSWO*					2												
GHOW					2	1	2	1	1		1						
YBCU							1										
BBCU	2		2	2		3					1					2	
BEKI	1		1	3	3	3	2	3	3	1	3		1		1	2	2
HAWO	2		2	3	3	3	2	2	2		3		1	1		3	3
DOWO	2		2	2	3	3	2	2	2		3	1	1		1		
BBWO	3	3	2	3	3	3	1		3		1						
TTWO*		3				3			2								
YBSS	2	2	3	3	3	1	2		2	2	2			1		3	3
PIWO			2		3	3	2	3	1		1		1			1	
NOFL	2		2	3	2	3	2	2	3	3	2	1		1	1	3	2
WHIP	2				2	2											
CONI	2			3	2	3	3										
CHSW	3		3		3	3		1	1		1				1	1	
RTHU	1		2	3	1	3	3	1	2		1					1	3
EAKI	3	2	2	2	3	3		2	2	1	1			1		3	2
GCFL			1			2		3							1	2	
EAPH	3		3		3	3			3		3			1	1	2	1
OSFL	1		1	2	2	2	2		2							2	
EWPE	2		2	1	2	2	2		2		1				1	2	3
YBFL		2	2	2	2	2	2	2	2								
ALFL	2	1	2	2	2	2	3	2	3		2			1	1	2	2
WIFL*																	
LEFL	2	1	3	2	3	2	3	2	2		2	1	1	1	1	2	
HOLA*																	
BLJA	3	1	3		3	3	1	2	1		1	1	1	1	1	2	2
GRJA	3	1	2		3	3	3	2	3		1						
CORA	2	1	3	2	3	3	2	1	1	1	1	1	1	1		2	
AMCR	2	1	3	3	3	3	3	1	3	1	1	1	1	1	1	2	3
EUST	3	1	3	3	3	3					3	1			1	3	3
BOBO	3		3		3	3					2				1	1	3
BHCO	1	1	2	1	3	3					1				1	2	3

Appendix E (continued)

	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303
RWBB	3	1	3	3	3	3	3	3	3	1	3	1		1	1	3	1
EAME	2					2					3	2				2	3
OROR*																	
NOOR					3	3					2				1	2	1
RUBL*						2	3	3	3								
COGR	1	1	3	1	3	3	3	3	3	3	3		1		1	3	
EVGR	2		3		1	3	1	2	2		2	1	1	1		1	
PIGR*									2								
PUFI	2		3	1	3	3	2	2	2		2		1	1	1	2	2
HOFI																	
RECR*	2																
WWCR*			1								1						
AMGO	2	2	2	1	3	3	2	1	1		2				1	2	2
PISI	2	1	2		1	3	2	2	2		2					1	
VESP	3		2			1											
SASP	3		3	2	3	3					3					3	2
GRSP*																	
STSP*						2											
WTSP	3	2	3		2	3	3	3	3		2	1	1	1	1	2	3
CHSP	3		3	2	3	3	3	2	3		2	1	1	1	1	3	3
FISP	1															2	2
DEJU	3	1	3	3	3	3	3	3	3		3			1	1	2	2
SOSP	3	2	3	2	3	3	3	1	2		2	1	1	1	1	2	2
LISP	3	2	1	1			3	3	3		3						
SWSP	3	2	2	2	2	1			2		3			1			
FOSP*																	
RSTO			1				2										
NOCA						1											
RBGR	2	2	3	2	3	2	3	2	3		2	1	1	1	1	3	1
INBU	1		2			2										2	3
SCTA	2	2	2	2	2		2	1	2						1	2	
PUMA*	1					1											
CLSW	3	1	3		3	3					3					3	
BASW	3		3	3	3	3	3	3	3	1	3	1	1		1	3	3
TRSW	3	1		3	3	3	3	3	3	1	3	1	1	1	1	3	1
BASW	3		3	3	3	3			3		3				1	1	
NRWS			3														
CEWA	3	1	1	1	3	3	3	3	3	2	3	1		1	1	1	3
REVI	2	2	3	3	2	3		3	3		3	1	1	1	1	3	3
PHVI*																	
WAVI	2	1		2	2										1	2	1
YTVI*																	
SOVI	3	2	3	3	2	3	2	3	3		2	1		1	1	2	3
BAWW	3	1	3	3	3	3	1	2	1		1	1		1	1	2	3
BWWA*																	
NAWA	3	2	3	3	3	3	1	3	3		2	1		1	1	2	
TEWA	2	2	2	2	2	3	1		1		3						
NOPA	3	2	3	2	3	3	1	3	2		3	1	1	1	1	2	3
CMWA	2	2	2	1	2	3		2	2		2	1		1			
YEWA	1	2	1		3	3			2		2			1	1	2	1
BTBW	3	2	2	2	2		2	2	2		1	1	1		1	2	3
YRWA	3	2	3	3	3	3	3	2	3		2	1	1	1	1	2	1
MAWA	3	1	3	3	2	3	3	3	2		2	1	1	1	1	2	3

	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303
CSWA	2	2	3	2	2	3	3	3	3		1	1	1		1	2	1
BBWA	3	1	2	2	2	3	2	3	3		3		1	1			
BPWA*					2	1			1								
BLWA	3	2	2	3	2	3	2	3	2		3	1	1	1	1	3	3
BTGW	3	2	3	3	3	3	3	3	3		2				1		2
PIWA	2	2				1					1						
PAWA						2											
PRWA*																	
OVEN	3	2	3	3	2	3	3	2	2		2	1	1	1	1	3	1
NOWA	2	1	2	2	2	3	2	3	3		3				1	2	1
LOWA*																	
MOWA			1					3	3								
COYE	3	2	3	3	3	3	3	3	3		3		1	1	1	2	3
WIWA			1		1		2		2								
CAWA	2	2	3	2	2	3	3	3	3		1	1	1	1	1	2	3
AMRE	2	2	3	3	3	3	3	3	3		3	1		1	1	3	3
HOSP	1		1		3	3										1	
WAPI*																	
NOMO						2									1		
GRCA	3	1	3	1	3	3	3	3	3		2	1	1	1	1	3	3
BRTH			2			3		2			1	1					
HOWR																	
WINR	2		3	2	3	3	2	2	2		2		1	1	1	2	1
MAWR																	
BRCR	1		3			3		3	3					1		1	2
WBNU			1		1	2	2						1		1		
RBNU	3		2		1	3	2	2	2		2			1	1	3	3
TUTI*			1														
BCCH	3	1	3	3	2	3	3	2	2		2		1	1	1	2	3
BOCH	3		3		1	3	2	1	2		2						
GCK1	3		3	2	2	3	2	2	2		2			1	1		
RCKI	2	1	2	2	2	3	2	2	2								1
BGGN*																	
WOTH	2	1	2	2	2		2			2	2	1	1	1	1	1	2
VEER	2	1	1	2	2	2	3	2	2	2	2	1	1	1	1	3	1
GCTH*																	
SWTH	2	1	2	2	3	3	3	3	3	2	2	1	1	1	1	2	
HETH	2	1	3	3	2	2	2	2	2		2			1		2	2
AMRO	3	2	3	3	3	3	3	3	3		3	1	1	1	1	3	3
EABL		1							3						1	3	

Appendix E (continued)

	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321
PBGR*							1											
CDLO	1			3	1	1	3						2		2		2	1
ATPU*																		
BLGU*																		
RAZO*																		
GBBG																		
HEGU																		
LAGU*																		
RBGU*																		
BOGU*																		
COTE																		
ARTE*																		
ROTE*																		
LETE*																		
BLTE*																		
LSPE*																		
GRCU*																		
DCCU																		
COME																		3
RBME*																		
HOME									3									3
MALL	1	2							3	2								2
ABDU	2	3				3	3	3	3	3	2						3	3
GADW*																		
AMWI*																		
GWTE																		
BWTE										2								1
NOSH*																		
RODU	3	3				3			3	3	2							3
RNDU	3	3						1		3								3
COGO																		
COEI*																		
CAGO																		
GLIB*																		
AMBI	2	2		1			2				1						2	2
LEBI*																		
GBHE	2	1	1	1			1		1								1	
SNEG*																		
TRHE*																		
LBHE*																		
CAEG*																		
GRHE																		
BCNH*																		
VARA*							1											
SORA*																		
COMO*																		
AMCO*																		
AMWO	2	2	1			2		2	2	1	3						2	3
COSN		2				2	2		1	2	2							
WILL*																		
UPSA*																		
SPSA	3	3						3		3							1	3
KILL	1	3	1	2		2	3	3	3		3							

	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321
PIPL*																		
SPGR										1	1						3	
RUGR	1	3		1		2	1	3	2		3				3		2	3
RNPH*																		
WITU*																		
RODO		3					3	3										
MODO		2	1			2	2	2	2	3	2						2	
TUVU*																		
NOHA	1	2						1	2	1								
SSHA																	1	
COHA*																		
NOGO																	1	
RTHA								1	1								1	
RSHA																	1	3
BWHA	1	3				2		3	2	2	3						3	3
BAEA									1			3	3				3	3
AMKE		3	1	1		1	1	3	2	3	1						1	
OSPR								1	1	1				3	3	3	1	3
LEOW*																		
BAOW									2									2
NSWO*						1												
GHOW							2										2	
YBCU										1								
BBCU							1			2								
BEKI	1	2				1			1	3	3						1	3
HAWO		2				1			3	2							1	3
DOWO		2	1	1		1	1	1	3	2							1	3
BBWO															2			
TIWO*																		
YBSS	1	3	1			3	2	3	2	3							1	3
PIWO						1	1	1	2	2					1		1	3
NOFL	1	3	1	1	1	3	3	3	3	3							1	3
WHIP		2					1				2							
CONI									1	2	2				1		2	
CHSW		3	1	1		2	2	3	1	2	1						2	
RTHU		2	1			1	1	1									1	3
EAKI		3	1	2	1	3	3	1	3	3							2	3
GCFL	1	1	1	1	1	2	1	2	2	3							2	
EAPH		3	1		3	3	3	3	3	2	3							3
OSFL	1					2				2							2	
EWPE	2	2	1			2	3	2		2							2	3
YBFL	1							2		2					2		3	
ALFL	2	2	1	1		2	2	2		3							2	
WIFL*																		
LEFL	2	2	1	1	1	3	2	2		2							2	
HOLA*																		
BLJA	1	2	1	1	1	2	3	3	2	2					2		2	3
GRJA										3					1		3	
CORA	1	3	1			1	3	1		2	1						2	3
AMCR	1	3	1	1	1	1	3	1	2	1							2	3
EUST	1	3	1	1	1	3	3	3	3		1							
BOBO		3	1	1	1	2	2	3	2	2								3
BHCO		2	1	1	1	2	2	1	1	2							1	2

Appendix E (continued)

	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321
RWBB	2	2	1	1	1	3	3	2	3	3	2							3
EAME			1				2											
ORUR*																		
NOUR	2	3	1		1	3	3	1	3	3								
RUBL*										1							2	3
COGR	3	3	1	1	1	3	3	3	3	3							1	2
EVGR	2	2				1	1	1	1	2					2		2	3
PIGR*																		
PUFI	2	2	1	1		2	2	2	3	2							2	3
HOFI							2											
RECR*																		
WWCR*																	2	
AMGO	2	2	1	1	1	2	2	1	3	2							2	3
PISI								1		2							2	3
VESP							1	2										
SASP			1	1		2	2	2		2								
GRSP*																		
STSP*																		
WTSP	1	2	1		1	3	2	2	3	3					1		3	2
CHSP	3	3		1	1	3	2	2	2								2	3
FISP							2	2										
DEJU		1	1				1	2		2							3	3
SOSP	1	2	1	1	1	3	2	3	2	3							2	3
LISP								3		3								
SWSP	2		1			3	2	2	3	3							2	
FOSP*																		
RSTD																		
NOCA																		
RBGR	2	3	1	1	1	2		2	3	3					1		2	2
INBU		2							1									
SCTA	1	1	1			2	1	2	2	2					1		2	
PUMA*							3	3										
CLSW	3	3	1			3	3	3	3								2	
BASW	3	3	1	1	3	3	3	3	3	2	3							3
TRSW	1	3	1	3	3	3	3	3	3	3	3						2	3
BASW				3			3		1									3
NRWS																		
CEWA	2	3	1			3	3	3	3	2							1	3
REVI	1	3	1	1	1	3	3	2	2	2					2		2	3
PHVI*																		
WAVI	1		1	1		2	2	2		2								
YTVI*																		
SOVI	1	2	1			2	1			2					1		3	
BAWW	1	3	1		1	3	3	2	2	3					2		2	
BWWA*																		
NAWA	1	2	1	1	1	2	2	3		2					2		3	
TEWA			1					2		3					2		3	
NOPA	2	2	1			2	2	2		2					2		3	
CMWA							1			2					2		3	
YEWA	1	3	1	1	1	3	2	3	3	2							2	3
BTBW								1									3	2
YRWA	2	2	1		1	3	2	3		3					2		2	3
MAWA	1	3			1	3	2	2		2					2		3	

	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321
CSWA	1	2	1	1	1	3	2	3	2	2							2	
BBWA							1			2					2		3	
BPWA*															2			
BLWA	2	2				1		2		2					2		3	
BTGW	1	2				2	2	2		3					2		2	
PIWA															2			
PAWA								2		3								
PRWA*																		
OVEN	1	2	1			3	2	2	2	2					1		3	3
NOWA	1		1		1	3	2	2	2	3							2	
LOWA*																		
MOWA								2									2	
COYE	1	3	1	1	1	3	3	2		3					2		2	3
WIWA										3							1	
CAWA		1	1		1	2	1	2		3							3	
AMRE	1	3	1	1	1	3	2	2	2	3							2	2
HOSP		1	1	1		3	3	3										
WAPI*																		
NOMO																		
GRCA	1	3	1	1	1	3	2	2	2	2	1						1	3
BRTH							3											
HOWR			1															
WIWR	1	2				2	1	2		2					2		3	
MAWR																		
BRCR	1									3					2		3	
WBNU						2				2					2		2	
RBNU	2	2	1			1		1		2					2		3	3
TUTI*																		
BCCH	3	3	1	1	1	3	3	3	1	2					1		3	3
BOCH										2					2		3	3
GCKI							2	2		2							3	
RCKI	1						1			2					2		1	
BGGN*																		
WOTH	2	3	1	1		2	2	1	3	2							1	3
VEER		2	1	1	1	2	2	2	2	3					1		1	3
GCTH*																		
SWTH										2					2		3	
HETH		2				2	1	2		2					2		3	3
AMRO	3	3	1	1	1	3	3	3	3	3	3						3	3
EABL																		3

Appendix E (continued)

	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339
PBGR*		3																2
COLO	3	3	3				3			3	3	2	2			2	2	3
ATPU*																		
BLGU*																		
RAZO*																		
GBBG			1															
HEGU	1		1								1	2						
LAGU*												1						
RBGU*																		
BOGU*																		
COTE			1															
ARTE*																		
ROTE*																		
LETE*																		
BLTE*																		
LSPE*																		
GRCO*																		
DCCO																		
COME		2									3	1						3
RBME*		3										3						
HOME		3										2						
MALL		2								3	3							
ABDU	2	3	3							3	3	3						1
GADW*																		
AMWI*																		
GWTE		1																
BWTE		3																2
NOSH*																		
WODU		3	3							3	3	3						1
RNDU		3								3		1						1
COGO		3	1							1	3	2						
COEI*																		
CAGO	3	3	3							3	3	3						
GLIB*																		
AMBI		3	1								2	1						2
LEBI*																		
GBHE		1	1			3				2	2	1						1
SNEG*																		
TRHE*																		
LBHE*																		
CAEG*																		
GRHE		1																1
BCNH*																		
VARA*		1																
SORA*																		1
COMO*																		
AMCO*																		
AMWO		3	2		2					2	1	1						2
COSN		3	2							1	3	1			1			2
WILL*																		
UPSA*																		
SPSA		3	1								3	3						3
KILL		3									3	1						3

	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339
PIPL*																		
SPGH		3								3	3	3						
RUGR	2	3	1		2					3	3	3						3
RNPH*																		
WITU*																		
RODO	1		3															3
MODO		3	2							2	2	2						2
TUVU*																		
NOHA	1	2									3	1						1
SSHA		2	1															1
COHA*																		
NOGO		1																
RTHA												1						1
RSHA	3	3																1
BWHA	1	3								1	3	2					1	1
BAEA		3	1								2							
AMKE	2	3	1												1			3
OSPR	1	3	3								3	1						
LEOW*			1															
BAOW	1	2	2									2						2
NSWO*																		2
GHOW	1	3	1						1			2						
YBCU			2															
BBCU		3	2															2
BEKI	1	3	3					1		2	2	3			1			3
HAWO	1	3	1					1	1	1	3	2					1	3
DOWO	1	2	3					1		1	3	2					1	3
BBWO		3	1				3				3	3			1			1
TTWO*		2																
YBSS	3	3	3		3			1	1	3	2	3					1	3
PIWO	1	1	3			3				2	2	2						3
NOFL	1	3	3		2				1	1	2	3			1		1	2
WHIP	2	2									2							2
CONI	2	2	1															2
CHSW	2	1	1		2					1	2	2						3
RTHU	3	1	1							1	3	3						3
EAKI	1	3	3							1	3	3			1			3
GCFL		2	2								2							2
EAPH	3	2	2							2	2	2					1	3
OSFL		2						1			3	2			1			2
EWPE	1	2	2						1	2	2	2		1			1	2
YBFL					2				1		2	2			1			
ALFL		2									2	1			1			2
WIFL*																		
LEFL	2	2	2		2			1	1	1	3	1					1	3
HOLA*																		
BLJA	2	3	1					1	1	2	2	3		1	1		1	3
GRJA		1								1	3	1						
CORA	1	3	1	1	2		1			2	3	2			1			3
AMCR	2	3	1	3				1		1	1	3		1	1		3	3
EUST	3	3	3									3						3
BOBO	3	3										2					1	3
BHCO	3	2	3	1				1		1	2	3					1	3

Appendix E (continued)

	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339
RWBB	3	3	3		2					2	3	2		1	2			3
EAME		2									2							3
ORDR*																		
NOOR	3	3								1	3			1			1	3
RUBL*											1							2
COGR	3	3	3	3	2					1	3	2		1	1			3
EVGR	2	2	3		2			1		1	2	2			1		1	3
PIGR*											3							
PUFI	3	2	3	1	2			1	1	1	3	2			1		1	3
HOFI																		2
RECR*										1	1	1						
WWCR*										1								
AMGO	3	2	2	2						2	2	1		1			1	2
PISI		2		1						1	1	1			1			
VESP																		2
SASP		3								1	3						1	3
GRSP*																		
STSP*																		
WTSP	2	3	3	1	2		2	1	2	2	3	2			1		3	2
CHSP	3	3	3						1	1	3	3		1	1		1	3
FISP																		2
DEJU		3	2		3			1	2	1	3	3			1			2
SOSP	3	3	3	2					2	2	3	2		1	1		1	2
LISP												1						
SWSP		2		1					1	1	2	1			1			2
FOSP*																		
RSTO											2							2
NOCA																		1
RBGR		3	3		2		2	1	2	1	3	2			1		1	2
INBU																		2
SCTA	1	2										2					1	2
PUMA*																		
CLSW	3	3	3	3						1	3	2					3	3
BASW	3	3	3	3				1		3	3	3		3			3	3
TRSW	3	3	3	3	3			1	1	3	3	3		1	1			3
BASW	3	3	3							3	3	3		1	3			3
NRWS												2						
CEWA	3	3	3				1	1	1	1	3	1					1	3
REVI	2	3	2		2			1	2	3		2		1	1		1	3
PHVI*					2													
WAVI										1								2
YTVI*																		
SOVI	2	3	2		2			1	1	1	3	2		1	1		1	2
BAWW	3	3	3					1	2	1	2	2					1	2
BWWA*																		
NAWA	3	2	3		2			1	2	1	3	1			1		3	2
TEWA		2	2		2			1	2			1			1			2
NOPA	2	3	3		2			1	2	1	3	3		1	1		1	2
CMWA		2	1							1								2
YEWA	2	3	3							1	2	1		1			1	3
BTBW		2						1	1	1	2	2					1	1
YRWA	3	3	3		3			1	1	1	3	3		1	1		1	2
MAWA	2	3	3		2			1	2	1	3	3			1		1	1

	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339
CSWA		3	3		2			1			2	1					1	2
BBWA		2			2					1	3	3			1			1
BPWA*		2			2						2	1						1
BLWA		2	3		3			1	1	1	3	3		1	1		1	1
BTGW	2	3	3		2			1	1	1	2	1					1	2
PIWA		2										1						
PAWA		2																
PRWA*																		
OVEN	2	3	3		2			1	1	2	2	3		1	1		1	3
NOWA		2	2		2			1	2		2	1			1		1	2
LOWA*																		
MOWA		2			3			1	1								1	
COYE	3	3	3		3			1	2	2	3	3		1	1		1	2
WIWA		3							1		3							1
CAWA		3	3					1	2	1	2	3					1	1
AMRE	3	3	3		2			1	1	1	3	2		1	1		1	3
HOSP	3													1				1
WAPI*																		
NOMO											2	2						1
GRCA	3	3	2							1	2	2		1			1	3
BRTH	1										2	2						2
HOWR		2	2							3	2							
WIWR		2	2		2			1	2		2	2			1		1	2
MAWR		2																
BRCR		2								1	2	2						1
WBNU		2			2						1	2						1
RBNU	2	3	2		2			1	1	2	3	2					3	2
TUTI*																		
BCCH	3	3	3					1	1	2	3	3		1	1		1	2
BOCH		2	1					1		2	2	2						
GCKI		2								1		2					1	2
RCKI		2	2		2			1	2	1	3	1			1			2
BGGN*																		
WOTH	2	3		1				1	2	1	1	2			1		1	2
VEER	2	3	3					1	1	2	2	2			1		1	2
GCTH*					3						2							
SWTH	2	3	2		3			1	1	1	3	2			1			1
HETH	2	3	3		2		2	1	1	2	3	3			1		1	2
AMRO	3	3	3	3	2			1	1	3	3	3		1	1		1	3
EABL	3																	

Appendix E (continued)

	340	341	342	343	344	345	346	347	348	350	351	352	353	354	355	356	357
PBGR*																	
COLO			1	2		1	1	3			2	2	2	2	2	2	
ATPU*																2	1
BLGU*																	
RAZO*																	
GBBG																	
HEGU																	
LAGU*																	
RBGU*																	
BOGU*																	
COTE								1									
ARTE*																	1
ROTE*																	
LETE*																	
BLTE*																	
LSPE*														3			
GRCU*																	
DCCU																	
CUME									1								1
RBME*																	
HOME		3	3			3											
HALL			3			3										3	
ABDU			3			3	3	3									
GADW*														1		3	1
AMWI*																2	
GWTE							1										
BWTE																2	
NOSH*																3	
WOOD		1	3			3	3		1								
RNDU						1										3	
COGO		3	3						1							3	
COEI*																	
CAGO						3											
GLIB*																3	
AMBI							1										
LEBI*														1		2	
GBHE			1			3											
SNEG*															1	1	1
TRHE*																	
LBHE*																	
CAEG*																	
GRHE		1															
BCNH*														1		2	
VARA*																	
SORA*																3	
COMO*							1									3	
AMCO*																1	
AMWO		2				3											
COSN						2	1									3	2
WILL*																3	
UPSA*																	
SPSA																1	
KILL	1		1	1											2		3
															3	3	

	340	341	342	343	344	345	346	347	348	350	351	352	353	354	355	356	357
PIPL*																	
SPGR							3										
RUGR						3	2									1	3
RNPH*														1	3	3	3
WITU*																	
RODO		1	3	2													
HODO			1	2										1		3	3
TOVU*							1							2		2	2
NOHA		2	2														
SSHA																2	
COHA*						1										1	1
NOGO																	
RTHA						3										1	
PSHA						1											
BWHA	1					2										2	
BAEA								1						1	1	3	1
AMKE	1	2	2	1		3					3		3	3		3	3
OSPR						1	1									3	1
LEOW*						1	3	1			3	3			1	3	3
BADW						2											
NSWO*														2		2	1
GHOW			3					1									
YBCU																3	1
BBCU				1		2										2	
BEKI		2		3		2								2		2	2
HAWO				1		2		1								3	1
DOWO			1	1		2		1						2		2	1
BBWO						3								2		2	3
TTWO*														1		1	
YBSS			1	2		3	1										
PIWO				2		2	1							2		3	3
NOFL		2	1	2		2								2	1	1	1
WHIP														2	2	3	1
CONI						1										2	1
CHSW		1	1	1		1	3	1						2		2	1
RTHU		1	2			2	1							2		1	1
EAKI	1	3	3	3	2	2	3							1		1	1
GCFL			1	2		2								1	2	3	3
EAPH			1	2		2								2		2	2
OSFL				1		2									2	3	2
EWPE	1	2	1	2		2	2							2		2	1
YBFL						2								2		2	2
ALFL			1		2	3	1							2		1	
WIFL*														2		2	3
LEFL	1		1	2	2	2	1										
HOLA*														3	2	3	1
BLJA	1	1	2	2		2	1							2	1	3	1
GRJA						1								1			1
CORA			1	3		2	1							1		2	1
AMCR		1	3	2		2	1							1	1	2	3
EUST	1	2	3	3	3	1	1							1	2	3	3
BOBO				2			1							2		3	2
BHCO	1	1	1	2		1	1								1	3	3

Appendix E (continued)

	340	341	342	343	344	345	346	347	348	350	351	352	353	354	355	356	357
RWBB	1		1	2		3	1							2	3	3	2
EAME			2											1		1	
OROR*																	
NOOR				2		2	2							1	3	3	2
RUBL*																	
COGR		3	1	2		3	2							3	2	3	2
EVGR		3	1	1		1								2		3	3
PIGR*																	
PUFI		3	3	2		3	2							2		2	3
HOFI																	
RECR*																	
WWCR*																	
AMGU	1	3	2	2		1	2							2	2	3	2
PISI						3								1		2	1
VESP			2	1													
SASP			1	1		2								2		3	
GRSP*																	
STSP*																	
WTSP	1	2	2	2	2	3	2							2	3	3	2
CHSP	1	2	2	2		3	2							2	2	3	3
FISP																	
DEJU	1			1		2								2		2	1
SOSP	1	2	2	2		3	2							2	3	3	3
LISP						2										2	
SWSP			1	1		3	1							2		2	
FOSP*																	
RSTD																	
NOCA																	
RBGR	1		1	2		3	1							2		3	3
INBU			2			3								1		1	
SCTA	1			2		2	1							2		3	1
PUMA*														3		1	
CLSW			1	1	3		3							3	3	3	3
BASW	1	3	3	3	3	1	3							3	3	3	3
TRSW	1		1	3	3	3	3							1	3	3	3
BASW			1	2		3	3								3	3	
NRWS				1													
CEWA	1	3	3	2	1	3	3							1	1	3	3
REVI	1		1	2		3	2							2	2	3	3
PHVI*						2											
WAVI	1		1	2			2									1	
YTVI*																	
SOVI	1			2		3								2	1	2	2
BAWW	1		1	2		3	2							2	2	3	3
BWWA*																	
NAWA				2		3								2	2	2	3
TEWA						2								1	2	2	2
NOPA	1		1	2		2	1							2	3	3	2
CMWA						2								2		2	
YEWA			1	2	2	3	2								3	3	3
BTBW				2		2								2		2	
YRWA			1	2		3								2	2	3	3
MAWA				2		2								2	2	2	2

	340	341	342	343	344	345	346	347	348	350	351	352	353	354	355	356	357
CSWA	1		1	2		2	2							2	2	3	2
HBWA						2								2	1		
BPWA*						1										1	
BLWA				1		2								2	2	2	2
BTGW	1			2		2								2	2	2	3
PIWA																2	
PAWA						3										3	
PRWA*																	
OVEN			1	2		3	3							3	3	3	3
NOWA	1	2		2		2	1							2		2	2
LOWA*																	
MOWA						3								1		3	
COYE	1		1	2	2	3	2								3	3	3
WIWA				1		1								1		3	
CAWA	1			2		2								3	3	2	2
AMRE	1	2	1	2	2	3	2							3	2	3	3
HOSP	1	1												3		3	
WAPI*																	
NOMO				3												1	
GRCA	1	1	2	2	2	2	2								3	3	3
BRTH			2													3	
HOWR																2	
WIWR				2		3								1		2	2
MAWR																2	
BRCR						1										2	1
WBNU			1				1							1			2
RBNU			1	1		3									2	2	2
TUTI*																	
BCCH	1		1	1		3	2							2	2	2	3
BOCH														1		2	1
GCKI				1		1								2		2	
RCKI						3								1		2	2
BGGN*																	
WOTH			1	2			2							2	2	3	
VEER			1	2		2	2							2	2	3	3
GCTH*																	
SWTH	1					2								2		2	3
HETH			1	2		2								2		3	2
AMRO	1	2	3	3	3	3								3	3	3	3
EABL						2										3	

Appendix E (continued)

	361	362	364	365	366	367	368	369	370	371	372	373	374	375
PBGR*														
COLO	2		1		3	2			1	3	1		2	2
ATPU*														
BLGU*														
RAZO*														
GBBG														
HEGU					1									
LAGU*														
RBGU*														
BOGU*														
COTE														
ARTE*														
ROTE*														
LETE*														
BLTE*														
LSPE*														
GRCO*														
DCCO														
COME								3				1	1	1
RBME*					3	3								
HOME														
MALL														
ABDU	1	1	2		3			3						3
GADW*														
AMWI*														
GWTE														
BWTE			1					1						
NOSH*														
WODU	1		1		3			3					3	3
RNDU					2			3						
COGO			2		3			1						
COEI*														
CAGO								1						
GLIB*														
AMBI	1		2		3			1						
LEBI*														
GBHE	1				1			1					1	1
SNEG*														
IRHE*														
LBHE*														
CAEG*														
GRHE												1		1
BCNH*														
VARA*														
SORA*														
COMO*														
AMCO*														
AMWO		2	2		3	3							2	2
CDSN	2		3		1									
WILL*														
UPSA*														1
SPSA	1		3		3								2	2
KILL			3		2						1		3	3

	361	362	364	365	366	367	368	369	370	371	372	373	374	375
PIPL*														
SPGR			3		3	1								
RUGR	3		3		3				1				3	3
RNPH*														
WITU*														
RODO													1	1
MODO					1							1	2	2
TUVU*														
NOHA														
SSHA														
COHA*			3											
NOGO			1											
RTHA			1											
RSHA					2									
BWHA			2		2	2	1		1		1		1	1
BAEA														
AMKE	1				1	1							2	2
OSPR			1		1	1								
LEOW*														
BAOW					2						1		1	1
NSWO*														
GHOW					1	1								
YBCU														
BBCU					3							1	2	3
BEKI	3		3		3	1	1						2	2
HAWO	1		3		2	3	1			1	1		1	1
DOWO	1	1	3		3	3						1	1	1
BBWO			1		1	3							1	
TTWO*														
YBSS	1	1	3		3	3			2		2		1	2
PIWO	1		1		2						1		1	1
NOFL	1	1	3		3	2	1		1	1	1	1	3	3
WHIP	2				2								2	2
CONI			1										1	1
CHSW	1		1		2				2		1	1	3	2
RTHU	1		1		2								2	2
EAKI	2	1			3	3			1	1		1	3	3
GCFL			1		3				1		1		2	2
EAPH	3		1		3							1	3	3
OSFL	1		2		2				1				1	1
EWPE	1	1	2		2	2			1		2		2	2
YBFL	2		1		3	2			1		1			
ALFL			1		2	2			1			1	3	2
WIFL*														
LEFL	1		2		2	3	1		1	1	2	1	1	2
HOLA*	1													
BLJA	1	1	3		3	3	1		1		1	1	1	2
GRJA					3		1							
CORA	1	1	3		3	3			1		1		1	2
AMCR	1	1	1		2	3			1		1	1	1	3
EUST					1	3			3	1			3	3
BOBO					1	1		1	2	1		1	3	3
BHCO					3	3			1			1	1	2

Appendix E (continued)

	361	362	364	365	366	367	368	369	370	371	372	373	374	375
RWBB	3	1	2		3	3	2		2				3	3
EAME													3	3
OROR*														
NOOR			3	2	2	2			1	1			3	3
RUBL*			2		3									
COGR	3	1	2		3	3	1		2	1	1	1	3	3
EVGR	1	1	1		3	3	1				1	1	1	1
PIGR*	1													
PUFI	3	1	3		3	2	1		2	1	2	1	2	2
HOFI														
RECR*														
WWCR*														
AMGO	1				3	2			1	1	1	1	3	3
PISI	1		1		3	2	1							
VESP														
SASP					1				1	1			2	2
GRSP*														
STSP*														
WTSP	3	1	3		3	3	1		2	1	2	1	3	3
CHSP	1	1	3			3	1		1	1	2	1	2	3
FISP												2	2	2
DEJU	3	1	3		3	3	1		1	1	1	1	2	2
SOSP	2		3		3	3	1		1	1		1	3	3
LISP	3				3		1					1		
SWSP	3		3		3	2			1			3	1	1
FOSP*														
RSTO														
NOCA														
RBGR	2	1	3		3	3	1		1	1	1	1	3	3
INBU					2									2
SCTA	1	1	2		3	2			1		2	1	3	3
PUMA*													1	1
CLSW					1	3	3						3	3
BASW	3	1	1		3	3	1		1	3		1	3	3
TRSW	3	1	3		3	3	1		3	3	1	1	3	3
BASW	3		1		3	3						1	3	3
NRWS						3								
CEWA	1	1	3		2	3	1		2	1	1	1	3	3
REVI	2	1	3		2	3	1		2	1	2	1	2	3
PHVI*			2											2
WAVI					2	3			1	1			1	2
YTVI*														
SOVI	2	1	2		3	3			1	1	2			2
BAWW	3		3		2	2			1	1	1	1	2	3
BWWA*														
NAWA	3	1	3		2	3	1		2	1	1	1	2	2
TEWA	1	1	2		3		1		1					
NOPA	2	1	3		2	3	1		2	1	2		2	2
CMWA	1		2			2			1			1		1
YEWA						2			1	1		1	3	3
BTBW	1		2		2	3			1	1	2		1	1
YRWA	2	1	3		3	2	1			1	2	1	1	2
MAWA	2	1	3		3	3	1		1			3	1	2

	361	362	364	365	366	367	368	369	370	371	372	373	374	375
CSWA	2	1	2		3	3	1		1	1		1	2	3
BBWA	1		3		2					1		1	1	1
BPWA*						3								
BLWA	2	1	2		2	3			1		2		2	2
BTGW	2		2		2	2					3	1	2	2
PIWA					1						1			
PAWA														
PRWA*														
OVEN	3	1	2		2	3	1		2	1	2	1	2	2
NOWA	3		3		3		1		2			1		1
LOWA*														
MOWA			2						1		3			
COYE	3	1	3		3	3	1		2	1	1	3	3	3
WIWA	3													2
CAWA	3	1	2		3	3			1		1			2
AMRE	2	1	3		2	3	1		2	1	3	1	2	3
HOSP						2				1			3	3
WAPI*														
NOMO													1	3
GRCA	3	1	1		2	3	1		1	1		1	3	3
BRTH												1	1	1
HOWR														
WIWR	2	1	2		2	2	1				2		2	2
MAWR														
BRCR			2		2								1	1
WBNU					2								1	1
RBNU	2	1	3		2	3			1	1	1	1	1	1
TUTI*														
BCCH	3		2		3	3	1		1	1	1	1	2	2
BOCH	1		2		3	2								
GCKI	3		2		2	2				1				
RCKI	2		2		2	2			1					1
BGGN*														
WOTH	2	1			2	2			1		2	1	2	2
VEER	2	1	2		2	2	1		1	1	2	1	2	2
GCTH*														
SWTH	3	1	3		2	2	1				2			1
HETH	3	1	3		3	3				1			1	2
AMRO	3	1	3		3	3	2		3	1	2	1	3	3
EABL													1	3

Appendix E (continued)

	376	377	378	379	380	382	383	384	386	387	388	391	392	393
PBGR*		3												
COLO		1	2	1		3	3	2	2	2			1	
ATPU*														
BLGU*														
RAZO*														
GBBG			1											
HEGU		1	1				1							
LAGU*														
RBGU*														
BOGU*														
COTE							3							
ARTE*														
ROTE*														
LETE*														
BLTE*														
LSPE*														
GRCO*														
OCCU		1					1							
COME		1					3			3				
RBME*														
HOME		3	3				3							
MALL		2					1							
ABDU		3	3			3	3			3			1	
GADW*														
AMWI*		1												
GWTE		3												
BWTE		2												
NOSH*														
WODU		3	1											
RNDU		1								3				
COGO		3					3			1				
COEI*														
CAGO		3	1									3		
GLIB*														
AMBI	1	3				2				1				
LEBI*														
GBHE		1	1			1	2			1				
SNEG*														
TRHE*														
LBHE*														
CAEG*														
GRHE														
BCNH*														
VARA*		3												
SORA*		3												
COMO*		3												
AMCO*														
AMWO		1	1				3			3				
COSN		3	2				3			1				
WILL*														
UPSA*														
SPSA		1			1	1							1	
KILL		1	3		1					1			1	

	376	377	378	379	380	382	383	384	386	387	388	391	392	393
PIPL*														
SPGR		1					3			1				
RUGR		1	3			3	3			3				
RNPH*														
WITU*														
RODO		3	3											
MODO	1		1				2							
TUVU*														
NOHA		2												
SSHA		1												
COHA*														
NOGO		1				1	1			1				
RTHA		1	3			1	3							
RSHA			1											
BWHA		2	2			1	3							
BAEA		3	1			1	3		3					
AMKE		3	3			1	1							
OSPR		3	2			1	3	3						
LEOW*														
BAOW		1					2			2				
NSWO*							2							
GHOW							1							
YBCU														
BBCU			2		1	2								
BEKI		3				3	3			3			3	
HAWO		2	2			1	2			1				
DOWO		1	1			1	1			1			1	
BBWO			2				1							3
TTWO*														
YBSS		1	2		1	1	3			3			1	1
PIWO		1			1		2				2		1	1
NOFL		2	3		1	1	3			3			1	1
WHIP							2							
CONI			2				2							
CHSW		2	3		1	1	1			1				
RTHU		1	2		1	2	3			1				1
EAKI	1	3	3	2	1	2	3			2				
GCFL			2			2				2			1	
EAPH		3	1		1	2	3			3				
USFL			2	2		2	2						1	2
EWPE		2	2	2		2	2						1	1
YBFL			2			2	2			1			1	
ALFL			3		1	2	3			2			1	
WIFL*														
LEFL		2	2		1	2	2			2			1	1
HOLA*														
BLJA		3	3	1	1	3	3			3			1	1
GRJA	1	1				3	2							
CORA		1	1	1	1	1	3			1	2			
AMCR		3	2	1	1	3	3			3	2			
EUST		1	3		1	1	3			3				
BOBO			3			3								
BHCO		1	1		1	1	3			1				

Appendix E (continued)

	376	377	378	379	380	382	383	384	386	387	388	391	392	393
RWBB	1	2	3		1	3	3			2				
EAME			2											
DROR*														
NOOR			2							2		1		
RUBL*						1				1				
COGR	1	3	3		1	3	3			3		1	1	
EVGR		1	1		1	1	3			1		1	1	
PIGR*														
PUFI		2	3	2	1	1	3			2		1	1	
HOFI														
RECR*														
WWCR*														1
AMGO	1	1	2		1	1	2			1				
PISI						1	3			1				
VESP			1											
SASP	1	2	3		1	1								
GRSP*														
STSP*														1
WTSP	1	3	3	3	1	3	3			3				
CHSP		1	3		1	1	3			3		1	1	
FISP			3											
DEJU		3	3	2	1	1	3			3		2	1	
SOSP		2	3		1	2	2			3		3	1	
LISP	3	3	3				2						2	
SWSP	1	3	3		1		2			3		1	1	
FOSP*														
RSTO														
NOCA														
RBGR			3	1	1	3	3			2		2	1	
INBU			1		1		1					1	1	
SCTA			2			1	2					1	1	
PUMA*		3	3				3							
CLSW		3	3			3	3							
BASW		3	3	3	1	3	3			3				
TRSW	1	3	3	3	1	3	3			3		1		
BASW		3	3				3							
NRWS			1											
CEWA	1	3	3	1	1	3	3			1		1	1	
REVI		2	2	2	1	2	3			2		1	1	
PHVI*														
WAVI														
YTVI*														
SOVI		2	2	2	1	2	2			2		1	1	
BAWW		3	3	2	1	3	3			2		1	1	
BWWA*														
WAWA	1	3	3	2	1	3	2			3		1	2	
TEWA		2			1	3	2			3				
NOPA		2	2	2	1	3	2			2		1	1	
CMWA			2			1	2					1	1	
YEWA	1	2	3		1		2			2				
BTBW			2		1	1	3					3		
YRWA		3	2	2	1	3	3			3		1	1	
MAWA		3	2		1	1	3			2		1	1	

	376	377	378	379	380	382	383	384	386	387	388	391	392	393
CSWA		1	3	2	1	1	3			2			1	1
BBWA					1		3			3			1	
BPWA*														
BLWA		2	2	2	1	3	2			2			1	1
BTGW		2	2			3	3							
PIWA			2				1							
PAWA	3	3	6				2							
PRWA*														
OVEN		3	2	2	1	3	3			2			1	1
NOWA		2			1	2	2			2				2
LOWA*														
MOWA			2	2			2			2			1	
COYE	3	3	3	3	1	3	3			2			1	1
WIWA	1	3	3				3							
CAWA	1	3	2		1	3	3			3			1	1
AMRE		3	1	2	1	3	3			2			1	1
HOSP		1												
WAPI*														
NOMO			2											
GRCA		1	1		1	2	2			2				
BRTH			3			2	1							
HOWR														
WIWR		1	2	2	1	2	3			2			1	1
MAWR		3												
BRCR							3						1	
WBNU			3				2				2			
RBNU		1	2	1	1	1	2						1	1
TUTI*														
BCCH		1	3	1	1	3	3			3	2		3	1
BOCH		1				1	2			1				
GCKI							2			3			1	
RCKI		2				1	2						1	
BGGN*														
WOTH		2	2		1	2				2				
VEER		2	2	2	1	2	2			1			1	1
GCTH*														
SWTH				2		1	3			2			1	1
HETH	1	2	2	2		2	2			3			1	
AMRO	1	3	3	3	1	3	3			3			1	1
EABL			2											

Appendix E (continued)

	394	395	396	397	399	400	401	402	403	404	406	407	408	409	411
PBGR*															
COLO				3	2	3	1			2	2		1	2	
ATPU*															
BLGU*															
RAZU*															
GBBG															
HEGU															
LAGU*				1											
RBGU*															
BOGU*															
COTE															
ARTE*															
ROTE*															
LETE*															
BLTE*															
LSPE*															
GRCO*															
DCCO															
COME				3	3	1					1				
RBME*				1											
HOME			3			1					1		3		
MALL															
ABDU			3	3		3		3			3		1		
GADW*															
AMWI*															
GWTE															
BWTE															
NOSH*															
WODU			3								1				
RNDU			3								3				
COGO											1				
COEI*															
CAGO											1				
GLIB*															
AMBI						1									
LEBI*															
GBHE				1		1					1		1		
SNEG*															
TRHE*															
LBHE*															
CAEG*															
GRHE															
BCNH*															
VARA*							1								
SORA*															
COMO*															
AMCO*															
AMWO				2	1	3					3				
COSN											2				
WILL*															
UPSA*											1				
SPSA	1		1	1	2		1	3			3				
KILL			3	3		1	1				3	2	2	1	

	394	395	396	397	399	400	401	402	403	404	406	407	408	409	411
PIPL*															
SPGR				1	3	1									
RUGR				3	3	3					3				
RNPH*											1				
WITU*															
RODO				1							3		1		
MODO				1		2					1		1	1	
TUVU*															
NOHA											1			1	
SSHA						1					2				
COHA*															
NUGO											1				
RTHA						1					1				
RSHA						1					1				
BWHA			1	1	3	3					3		2	1	
BAEA											1				
AMKE		1	1	1							3		2	1	
OSPR				1		1			3		1				3
LEOW*															
BAOW				2		3					2				
NSWO*						2					2				
GHOW						2					2				
YBCU														1	
BBCU				2							3	1	2	2	
BEKI	1		3	1		1	1	3			3		2	2	
HAWO				1	1	1					3		3	1	
DOWO				3	1	3					3		3	1	
BBWO		1		3	1	1					1		1		
TTWO*															
YBSS			1	1	2	1		1			3	2	3	3	
PIWO				1	2	2					3		2	1	
NOFL	1	1	1	3	2	3	1	1			3		3	1	
WHIP															
CONI				1			1	2			2	1			
CHSW				3	1	3					1		1	1	
RTHU				2	1	1					1		1	1	
EAKI			1	1		3	1				3	2	2	2	
GCFL				1	1	1					3		2	1	
EAPH				2		3	1				3	1	2	1	
OSFL				2	1	1					2			2	
EWPE			1	2	2	1	1				3		2	2	
YBFL	1		1		1	1					2		1	2	
ALFL				1		1					2	2	2	1	
WIFL*															
LEFL		1		3	2	2		1			3	2	2	2	
HOLA*															
BLJA		1	1	1	3	2	1	2			3	2	2	3	
GRJA			1	1	1	1					1		1		
CORA			1	1	1	2					3	1	2	2	
AMCR	1		1	1	1		1	1			3	1	3	2	
EUST				3							3	1	3	1	
BOBO			1	2							3	2	3	2	
BHCO				1	1	1	1				3	1	3	3	

Appendix E (continued)

	394	395	396	397	399	400	401	402	403	404	406	407	408	409	411
RWBB	1	1	1	2	2	3	3	2			3	2	2	2	
EAME											2		1	1	
ORDR*															
NOOR				3							3			1	
RUBL*											1		1		
COGR			3	3	3	3	1	3			3	2	3	3	
EVGR			1	3	3	2	1	2			3	1	2	1	
PIGR*				1							1				
PUFI	1	1	1	3	2	3	1	2			3		2	2	
HOFI															
RECR*															
WWCR*					1										
AMGO				1	2	2	1				3	2	2	2	
PISI					2	2					3		1		
VESP											1		1	1	
SASP			1	1			1				3	2	2	3	
GRSP*															
STSP*															
WISP	1	1	1	3	3	3	1	2			3	2	3	3	
CHSP	1	1		2		3	1	2			3	2	2	2	
FISP														2	
DEJU	1	1	1	3	2	2	1				2	1	2	2	
SOSP			1	2	2	2	1	1			3	2	3	3	
LISP	3	1	1			1					1			2	
SWSP				1	3	3	1				3	1		3	
FOSP*															
RSTO															
NOCA															
RBGR	1		1	3	3	2					3	2	2	2	
INBU				1							3	2		3	
SCTA				1	2	1	1				3		2	2	
PUMA*											3		3	1	
CLSW			1	3			1				3	1	3	3	
BASW				3	1	3	3	2			3	3	3	3	
TRSW	1	1	1	3	1	1	1	2			3	2	3	3	
BASW			3	3		1	1	3			3		3		
NRWS															
CEWA	1	1	1	3	2	2	2	2			3	1	2	1	
REVI	1	1	1	2	3	3	2	2			3	2	3	2	
PHVI*						3									
WAVI				2		2					3		3	1	
YTVI*															
SOVI		1		1	3	1	1				3	2	2	2	
BAWW	1		1	2	2	3		1			3	2	3	3	
BWWA*															
NAWA	1	1	3	1	2	2	2	2			3	2	3	3	
TEWA		1		1	2	2					2		3	3	
NOPA	1	1	1	2	2	2	1	1			3	2	3	3	
CMWA				1	3						1		1	3	
YEWA				2	3	2	1				2	2	2	1	
BTBW				2	2	2		1			3			2	
YRWA		1	1	2	2	2	1	1			1	2	3	3	
MAWA	1	1	1	1	3	3	3	1			3	2	3	3	

	394	395	396	397	399	400	401	402	403	404	406	407	408	409	411
CSWA			2	2	3	3	1	1			3	2	3	2	
BBWA		1		1	3	2					2	1		1	
BPWA*						1					1				
BLWA		1		2	3	2	1	1			3	2	3	2	
BTGW				2	3	2	1				3		1	2	
PIWA					1		1				3				
PAWA			1								1				
PRWA*															
OVEN	1	1		3	3	2	2	2			3	2	2	3	
NOWA	1		1	2	3	3	1	1			3		2	2	
LOWA*															
MOWA						2					3			2	
COYE	1	1	1	2	3	3	2	2			3	2	3	3	
WIWA				2											
CAWA	1			2	3	2	3	3			3	1	3	3	
AMRE	1	1	1	2	3	3	2	2			3	2	2	3	
HOSP				3							3				
WAP1*															
NOMO				1							1				
GRCA				3	2	3	1	1			3	2	3	3	
BRTH											2			2	
HOWR				3							1				
WIWR	1	1	1	2	2	2		1			2	2	2	2	
MAWR															
BRCR			1		1	3					1				
WBNU				1	1	3					3				
RBNU				1	1	2	3				2		3	3	
TUTI*															
BCCH		1	1	3	3	3	3	1			3	1	2	3	
BOCH				1	1	1					1		1	2	
GCKI					2	1		1			3		3	3	
RCKI	1	1		1							2		1	2	
BGGN*															
WOTH	1			2	3	3	1				3	2	2	2	
VEER	1		1	2	3	3	1	2			3	2	3	3	
GCTH*															
SWTH				2	3	2		2			3		2	2	
HETH		1	1	2	1	3	2	2			3	2	1	2	
AMRO	1	1	1	3	3	3	2	2			3	3	3	3	
EABL				3							3				

Appendix E (continued)

	412	413	415	416	417	418	419	421	422	423	424	425	427	428	429
PBGR*															
COLO				1	2	1	2		3	2	1	3	1		
ATPU*															
BLGU*															
RAZO*															
GBBG															
HEGU				1						1					
LAGU*															
RBGU*															
BOGU*															
COTE															
ARTE*															
ROTE*															
LETE*															
BLTE*															
LSPE*															
GRCO*															
OCCO				1											
COME			1	3			1		3	2		3			
RBME*															
HOME				3						1	3	3			
MALL															
ABDU			3	3			1		3			3			
GADW*															
AMWI*															
GWTE			3	3											
BWTE															
NOSH*															
WOOD							1		3			3			
RNDU									2		3	3			
COGO				2					3		2	3			
COEI*															
CAGO															
GLIB*															
AMBI				1			1								
LEBI*															
GBHE				1					2	1	1				
SNEG*															
TRHE*															
LBHE*															
CAEG*															
GRHE															
BCNH*															
VARA*															
SORA*															
COMO*															
AMCO*															
AMWO				1											
COSN				1											
WILL*															
UPSA*															
SPSA				1			1			1	1				
KILL				1		1	1								

	412	413	415	416	417	418	419	421	422	423	424	425	427	428	429
PIPL*															
SPGR			1						3						1
RUGR			3	3		1				1		3			1
RNPH*															
WITU*															
RODO						1									
MODO															
TUVU*															
NOHA				1											
SSHA											1	1			
COHA*												1			
NOGO				1											
RTHA				1											
RSHA															
BWHA			1	1		1			1	1	3	1			1
BAEA		3							1						
AMKE	3														
OSPR			1	1					3	3	1			3	
LEOW*															
BAOW															
NSWO*															
GHOW				1		3					1				
YBCU															
BBCU				2											
BEKI				1			1			3	1	1			
HAWO			1	1		1			1	1	3	2			
DOWO			1	1		1				1	1				
BBWO			1	1							3				
TTWO*															
YBSS			1	2					1	1	2	1			1
PIWO				1		1				1		1			1
NOFL				2			1			1		1		1	1
WHIP															
CONI				1										2	1
CHSW			1	1			1					1		1	1
RTHU			1	2		1	1					1			1
EAKI				1		1	1		1	3	1	1		1	
GCFL															1
EAPH				1		1	1				3				
OSFL			2	1						1	1	2		1	1
EWPE				1		1	1			2	1				1
YBFL										1					1
ALFL			2							2					1
WIFL*															
LEFL			1	2		1	1		1	1	1	2			1
HOLA*															
BLJA			3	1		1	1		1	2	1	1		1	1
GRJA			1	3											
CORA				1		1	1		3	2					1
AMCR				1		1	1	1	1	1		3			1
BUST						1	1								
BOBO				2		1				2					
BHCO			1	1		1	1			2	1				

Appendix E (continued)

	412	413	415	416	417	418	419	421	422	423	424	425	427	428	429
RWBB			1	3		1	1		1	3	1	1		1	1
EAME															
OROR*															
NOOR							1			1					
RUBL*				2					1						1
COGR			1	2		1	3		1	3	1	1		1	3
EVGR			1	3		1	1			2	1			1	
PIGR*				1											
PUFI			1	2		1	1	1		1	2	2		1	3
HOFI															
RECR*															
WWCR*			1												
AMGO			1	1		1	1			2		1			
PISI			1	1											
VESP															
SASP															
GRSP*															
STSP*															
WTSP			1	3		1	1	1	1	2	3	3		1	3
CHSP			1	3		1	1	1	1	2	1	2			
FISP															
DEJU			3	3		1	1	1		1	3				
SOSP			1	2		1	1		1	2	1	1		1	3
LISP							1								1
SWSP							1		1	2	2			1	
FOSP*															
RSTO															
NOCA															
RBGR			1	2			1			1	3	2		1	1
INBU									2					1	
SCTA				1			1		1	1					
PUMA*															
CLSW			1	2		1	1	1		3					
BASW				1		1	3		1	3		3		3	1
TRSW			1	3		1	3			3	3	3		1	1
BASW								1							
NRWS															
CEWA			1	1			1		1	3	1	1		1	1
REVI			2	3		1	1	1	1	2	2	1		1	1
PHVI*															
WAVI	3														
YTVI*															
SOVI			2	2			1			2	1	2		1	1
BAWW			3	1			1			1	1	1		1	1
BWWA*															
NAWA			2	3		1	1	1		2	1	2		1	1
TEWA			3	2						1	1				1
NOPA			2	3			1		1	2	1	1			1
CMWA			1	1						2					1
YEWA						1	1			2					
BTBW				2		1	1		1	2	1	1			
YRWA			2	3			1	1		1	1	1		1	1
MAWA			2	3		1	1	1	3	2	1	3		1	1

	412	413	415	416	417	418	419	421	422	423	424	425	427	428	429
CSWA			2	3		1	1		1	2	1	2			1
BBWA			1	1			1		1	2		1			
BPWA*															
BLWA			2	2		1	1			2	1	1			1
BTGW			2	2		1	1		1	2	1				1
PIWA															
PAWA										2				1	3
PRWA*															
OVEN			2	3		1	1		1	2	1	1		1	1
NOWA			1	1			1			2		2			1
LOWA*															
MOWA										2					
COYE			2	3		1	1	1	1	2	1	2		1	3
WIWA															1
CAWA			2	3		1			1	1				1	1
AMRE			2	3		1	3	1	1	2	2	1		1	
HOSP															
WAPI*															
NOMO				1											
GRCA				1		1	1			1	1			1	1
BRTH				1											
HOWR															
WIWR				2		1	1	1		2	1	1			1
MAWR															
BRCR				3						2					
WBNU								1							1
RBNU			1	2		1	1			1	1	1			1
TUTI*															
BCCH			1	2			1		1	2	2	1			1
BOCH				3						1					
GCKI				2				1		1	2	1			
RCKI			1	3				1		2	1			1	1
BGGN*															
WOTH				2			1		1	1	1			1	1
VEER				2		1	1		1	1		2		1	1
GCTH*															
SWTH			3	1			1		1	2	2	2			1
HETH			1	2		1			1	1	1			3	1
AMRO			3	3		1	3		1	3	3	3		1	1
EABL															

Appendix E (continued)

	431	432	433	434	435	437	438	441	442	443	444	445	446	447
PBGR*			1											
COLU				2			1	2	2	1	2	2	1	
ATPU*														
BLGU*														
RAZO*														
GBBG														
HEGU													1	
LAGU*														
RBGU*														
HOGU*														
COTE														
ARTE*														
ROTE*														
LETE*														
BLTE*														
LSPE*														
GRCO*														
DCCO														
COME			3											
RBME*														
HOME			1	2										
MALL														
ABDU		3	3	3			1	1		1				
GADW*														
AMWI*														
GWTE				1										
BWTE				2										
NOSH*														
WODU		1	1	3										
RNDU				3										
COGO														
COEI*														
CAGO														
GLIB*														
AMBI				1									1	
LEBI*														
GBHE			1	2	1	1				1				
SNEG*														
TRHE*														
LBHE*														
CAEG*														
GRHE														
BCNH*														
VARA*														
SORA*														
COMO*														
AMCO*														
AMWO		3	2	1	1		1		2					
COSN					1	1								
WILL*														
UPSA*														
SPSA			3											
KILL		3	2	1	1	1							1	

	431	432	433	434	435	437	438	441	442	443	444	445	446	447
PIPL*														
SPGR														
RUGR		3	3						1	3			1	
RNPH*														
WITU*														
RODO	1								2					
MODO		2			1									
TUVU*														
NOHA														
SSHA		3	1										1	
COHA*														
NOGO		2												
RTHA		2											1	
RSHA		1												
BWHA		3	2	1	1					1				
BAEA		3	1	1		3								3
AMKE		2	2	1	1									
OSPR		2	1	2	1	3			3					3
LEOW*														
BAOW			2		1									
NSWO*														
GHOW			2											
YBCU														
BBCU		1	1		1									
BEKI	1	2	1	1	1					1			1	
HAWO		3	3		1	1	1		1	3	1		1	
DOWO		2	3		1	1			1	1				
BBWO		3	3											
TTWO*														
YBSS		3	3		1	1	1		1	3			1	
PIWO		2	2	1	1					1			2	
NOFL		2	3		1	1			1	3			1	
WHIP														
CONI	1	2											1	
CHSW			3		1	1				1			1	
RTHU		1	1			1							1	
EAKI		2	3	1	1	1			1	3			1	
GCFL			2		1								1	
EAPH			2		1				1					
OSFL		2	2		1	1							1	
EWPE	1	2	2		1	1				1			1	
YBFL		2							1					
ALFL	1	2	2		1	1	1						1	
WIFL*														
LEFL	1	2	2		1				1	2			1	1
HOLA*														
BLJA	1	3	3	1	1	1	1		1	3	1		1	
GRJA		3					1							
CORA	1	2	2		1	1	1		1	3			1	
AMCR	1	2	3		1				1	1			1	
EUST		3	3	1	1	1			1	1			1	
BOBO			3		1	1			1	3			1	
BHCO	1	2	3		1	1			1				1	

Appendix E (continued)

	431	432	433	434	435	437	438	441	442	443	444	445	446	447
RWBB	1	3		1	1	1		3	1	3	1		1	
EAME					1									
OROR*														
NOOR	1		1	3										
RUBL*					1									
COGR	1	3	3	1	1	1	1		1	3			1	
EVGR	1	2	2	1	1	1	1		1	1			1	
PIGR*														
PUFI		2	2		1	1	1		1	2	1		1	
HOFI														
RECR*														
WWCR*														
AMGO	1	3	2		1	1			1	1			1	
PISI		2	1			1				3			1	
VESP														
SASP		2	3		1	1			1		1		1	
GRSP*														
STSP*														
WTSP	1	3	3		1	1	1		1	3			1	
CHSP	1	3	2		1	1	1		1	3				1
FISP										1				
DEJU		3	3			1			1	3			1	
SOSP	1	3	3		1	1	1		1	3			1	1
LISP											1			
SWSP		2	2								1			
FOSP*														
RSTO														
NOCA														
RBGR		2	3		1	1				3			1	
INBU		2	3		1									
SCTA		2	2		1	1				1			1	
PUMA*	3				1									
CLSW	3		3		1	1			1				1	
BASW	3	3	3		1	1			1	3			1	1
TRSW		3	3	1	1	1			1	3	1			1
BASW		1			1	1								
NRWS														
CEWA	1	3	3		1	1			1	1	1		1	
REVI	1	3	2		1	1	1		1	2			1	1
PHVI*													1	
WAVI	1		1											
YTVI*														
SOVI		3	2		1	1	1		1	1			1	
BAWW	1	2	3		1	1	1		1	3			1	
BWWA*														
NAWA		3	3		1	1	1		1	1	1		1	
TEWA		3	3		1	1			1				I	
NOPA		3	3		1	1			1	1			1	1
CMWA		3	3			1								
YEWA		2			1	1			1					
BTBW		2	2		1		1			1			1	
YRWA		3	3		1	1	1		1	3	1		1	
MAWA	1	3	2		1	1	1		1	1			1	

	431	432	433	434	435	437	438	441	442	443	444	445	446	447
CSWA		2	2		1	1			1	3			1	
BBWA		3	1										1	
BPWA*													1	
BLWA		3	3		1	1	1		1	1			1	
BTGW		3	2		1	1	1			1			1	
PIWA														
PAWA														
PRWA*														
OVEN		3	2		1	1	1		1	1			1	
NOWA		2	2			1			1	2			1	
LOWA*														
MOWA		2								3				
COYE	1	3	3		1	1	1		1	3	3		1	1
WIWA		2			1									
CAWA		2	2		1	1				3			1	
AMRE	1	3	2		1	1	1		1	1			1	1
HOSP		1			1	1			1	3			1	
WAPI*														
NOMO														
GRCA	1	3	2		1	1	1		1				1	
BRTH														
HOWR									2					
WIWR		3	2		1	1			1	1			1	
MAWR														
BRCR		3											1	
WBNU					1	1				1				
RBNU		3	1		1	1			1	1			1	
TUTI*														
BCCH	1	3	3		1	1	1		1	1			1	
BOCH		3												
GCKI		3	2		1	1							1	
RCKI		2	2		1		1		1				1	
BGGN*														
WOTH	1	2	2		1	1			1	3			1	
VEER	1	2	3		1	1	1		1	3			1	
GCTH*														
SWTH		3			1	1	1		1	2			1	
HETH		3	2		1	1	1		1	3	1		1	
AMRO	3	3	3		1	1	1		1	3			1	1
EABL														

Appendix E (continued)

	448	449	450	451	452	454	455	456	457	458	459	460	461	462	463	465
PBGR*																
COLO		2	2	1		3		2	3	1	1		2	1		
ATPU*																
BLGU*																
RAZO*																
GBBG						1										
HEGU						1								1		
LAGU*																
RBGU*																
BOGU*																
COTE						1							1			
ARTE*																
ROTE*																
LETE*																
BLTE*																
LSPE*																
GRCO*																
DCCO						1		1								
COME		1	1						3	1	1		3	3		
RBME*																
HOME		1									3		3	3		
MALL																
ABDU		3	3			1		1	3	1	3	1	3	3		1
GADW*																
AMWI*																
GWTE													3			
BWTE																
NOSH*																
WODU						1		1			1		1	3	3	
RNDU			1					1	3				3			
COGO			1										3	3		
COEI*																
CAGO			1											1		
GLIB*																
AMBI			2			3			2				1			
LEBI*																
GBHE		1	3			1		1	1			1	1	1		
SNEG*																
TRHE*																
LBHE*																
CAEG*																
GRHE																
BCNH*									1							
VARA*																
SORA*																
COMO*																
AMCO*																
AMWO		1	1			2		2	3			1	3	3		3
COSN			1			1			2		2		1			1
WILL*																
UPSA*																
SPSA		1	1			1		1	3	1	1			1		3
KILL			1			1	1	1	3	1			3	3		3

	448	449	450	451	452	454	455	456	457	458	459	460	461	462	463	465
PIPL*																
SPGR			3										3			
RUGR		1	3						3	2	2	1	3	3		3
RNPH*																
WITU*																
RODO						3	1	1					3	3		
MODO									3	1		1	3	2		
TUVU*																
NOHA									1		1		1			
SSHA			1						1	1			1			
COHA*											1					
NOGO		1	1			1			2		1		2	2		
RTHA			1						2	1						
RSHA		1												1		
BWHA		1	1			2		1	3	1	1		2			1
BAEA	3					1	3	1						1	3	
AMKE		1							2	1	1		1	1		
OSPR	3	3	3		3	2		1	2	1	3		1	1	3	
LEOW*																
BAOW									2					1		1
NSWO*																
GHOW			2										1			
YBCU		1							2					2		
BBCU						2	1	2	2	1						
BEKI		1	2			1		1	2	1	1		1	2		1
HAWO		1	2			1	1		3	3			2	2		3
DOWO		1				3	1	1	3	3		1	2	3		3
BBWO			1			1			1	1	1		2	2		
TTWO*																
YBSS		1	3		1	1	1		3	2	2		2	2		1
PIWO	3	1	2			1			2	1			2			1
NOFL		1			1	3	1	1	1	3	3		1	3		3
WHIP				2					2				1			
CONI		1	2		1	3	1	2	2				2			
CHSW		1	1			3			3	1	1		3	1		1
RTHU			1						2				1	1		1
EAKI		1	1			3	1	1	3	1	1		3	3		2
GCFL						1			2	2						2
EAPH						1				1	1		3	1		3
OSFL		2	2			1		1	2	2	1					
EWPE		1				2	1	2	2	2			1	2		2
YBFL			1			1			2	1			2	2		2
ALFL		1							2	2			2	3		2
WIFL*																
LEFL		1	2			1			3	2	2		2	3		2
HOLA*																
BLJA		1	3		1	1	1	1	3	2	1	1	1	2		1
GRJA		1	3						3	1	1	1		3		
CORA	3	1	2			3	1	1	3	1	1	1	1	3		2
AMCR		1				3	1	1	2	2		1	1	3		1
EUST		1				1	1	1	3	2		1	3	3		
BOBO		1								2	1		1	3		
BHCO		1				1	1	1	2	2			1	3		1

Appendix E (continued)

	448	449	450	451	452	454	455	456	457	458	459	460	461	462	463	465
RWBB		3	1			2	1	2	3	2	2	1	1	3		3
EAME													1			
OROR*																
NOOR							1		1				1			2
RUBL*						1										3
COGR		3	1		1	3	1	1	3	2	1		1	3		3
EVGR		1	3			1	1	1	2	2			2	3		1
PIGR*																
PUFI		1	3		1	2		1	3	2	1		2	2		3
HOFI																
RECR*			1													
WWCR*			1													
AMGO		1	1			2	1	2	2	1	1		3	3		1
PISI		1	2						2	1	1		1	2		
VESP																
SASP										1	1		3	3		
GRSP*																
STSP*																
WTSP		2	3		3	3	1	2	3	2	2		3	3		3
CHSP		1				3	1	2	3	2			3	3		3
FISP																
DEJU		1	3		1			1	3	1	2		3	3		2
SOSP		2	2			3		2	3	1			3	3		2
LISP						2	1	2			1					2
SWSP		1				3	1	2	2				3	3		2
FOSP*																
RSTO																
NOCA																
RBGR		1	2		1	2	1	2	3	2	2		2	3		3
INBU		1	2						3	1						1
SCTA		1				1		1	2	1	1		1	1		1
PUMA*																
CLSW		3				1	3	1		3			1	3		3
BASW		3	1			3	1	2	3	2	1		3	3		3
TRSW		3	3			3	1	2	3	2			3	3		3
BASW		3				3		1	3	1			3	3		3
NRWS																
CEWA		1	1		1	1	1	1	3	2	1		3	3		1
REVI		1	1		2	2	1	2	3	2	2		2	1		
PHVI*																
WAVI						1	1			1				3		
YTVI*																
SOVI		1	2			3	1	2	2	2	2		3	1		3
BAWW			2		1	3	1	2	2	2	2		2	3		2
BWWA*																
NAWA		1	2		1	2	1	2	2	2			2	2		2
TEWA		2	2			2	1	2	2	2	2		2	3		2
NOPA		2	2			2	1	2	3	2	2		2	2		3
CMWA		1	2				1		3	2	2		1	3		
YEWA		2				1	1	1	3	2			2	3		1
BTBW		2	2		1	2	1	2	3	2	2			1		2
YRWA		1	2		1	2		2	3	2	2		3	3		3
MAWA		1	2		1	2	1	2	3	2	2		2	2		3

	448	449	450	451	452	454	455	456	457	458	459	460	461	462	463	465
CSWA		2	2		1	1	1	1	2	2			3	2		2
BBWA		1	2				1	1	2	2	2		3			2
BPWA*		1														
BLWA		1	2		1	2	1	2	3	2	3		3	3		3
BTGW		1	2		1	2	1	2	3	2	2		3	3		2
PIWA						2	1	2								
PAWA											3					
PRWA*																
UVEN		2	2			3	1	2	3	2	2		3	3		2
NOWA		1	2			1	1	1	2	2			1	2		2
LOWA*																
MOWA		1	2						2	2				1		
COYE		2	2		1	3	1	2	3	2	2		3	3		3
WIWA			1			1			2				3			
CAWA		1	2		1	2	1	2	3	2	2		3	3		2
AMRE		2	2		1	2	1	2	3	2			2	3		2
HOSP						1	1	1				1	1	3		
WAPI*																
NOMO													1	2		
GRCA					1	2	1	1	2	2	1		2	3		2
BRTH										1						
HOWR							3									
WIWR		1	2		1	2		2	2	2	2		2	2		2
MAWR																
BRCR		1	2						3	2			1	2		
WBNU									3				1			
RBNU		1	2			3	1	1	3	3	1					3
TUTI*																
BCCH		3	2		2	3	1	1	3	3	2	1	1	3		2
BOCH		1	3						2							1
GCKI		1	1			1	1		3	1	1		2	3		
RCKI		1	2			1	1		3	1			2	1		
BGGN*																
WOTH		2			1	2	1	2	3	2			2	2		
VEER		2			1	3	1	2	3	2	2		2	3		2
GCTH*																
SWTH		1	2		1	2		2	3	2			2	2		2
HETH			2		1	2	1	2	3	1	2		2	2		2
AMRO		3	2		1	3	1	2	3	2	2	1	3	3		3
EABL																

Appendix E (continued)

	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483
PBGR*																
COLU	3			3	3	1	1	3	3	3		3	3			
ATPU*																
BLGU*																
RAZO*																
GBBG																
HEGU			3	1		1										
LAGU*					1											
RBGU*																
BOGU*																
COTE				3	2	3				1						
ARTE*																
ROTE*																
LETE*																
BLTE*																
LSPE*																
GRCO*																
DCCO				1						1						
COME			3	3				3	3	1			1			
RBME*					2					1						
HOME	3												3			
MALL	1									1						
ABDU	3			3			1		3	1			3	1		1
GADW*																
AMWI*																
GWTE	3			1												
BWTE	1												1			
NOSH*																
WODU	3			2					1				3			
RNDU	1								3				3	1		
COGO	1			2			1	1	3				3			
COEI*																
CAGO				1						1						
GLIB*																
AMBI				3					2	3						
LEBI*																
GBHE	1			3		2	1		1	1			3			
SNEG*																
TRHE*																
LBHE*																
CAEG*																
GRHE				1				1								
BCNH*				1												
VARA*				1					1							
SORA*																
COMO*																
AMCO*																
AMWO	2			1			2		3	1				1		1
COSN	1					1			1				2			
WILL*																
UPSA*																
SPSA				1		1	2	2	3							
KILL						1			1							

	466	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483
PIPL*																
SPGR				2					1	1						1
RUGR				2			1	2	3	1				1	1	
RNPH*																
WITU*																
RODO									1							
MODO						1			1							1
TUVU*																
NOHA																
SSHA	1												3			
COHA*																
NOGO				3		1	1									
RIHA				2					1				3	1	1	
RSHA	1			2												
BWHA				3			1	1	3	1						
BAEA				1		3		3	3	3						
AMKE								1	1							
OSPR				3		1	1	1	3	1	3		1			
LEOW*																
BAOW				3						1						
NSWO*				3				1	1							
GHOW				3												
YBCU														1	1	
BBCU																
BEKI				3		2		2	1	1				1		1
HAWO	1			2		1	1	3	1							
DOWO	1			2		1		1	1		1					
BBWO				3				3		1						
TTWO*						3										
YBSS	1	1		3		1	3	1	3	3	1			2		
PIWO	1	1		3		1		1	1	1				1		1
NOFL	1			3			1	1	3	1			1			
WHIP										1						
CONI								3	2	1						
CHSW	1	1					1	1					1			
RTHU				2						1	1					
EAKI	1			2			2	3	2				1			
GCFL								1	1				1			
EAPH				1												
OSFL	1			3		1	2	2	2				1	1		
EWPE	1	1		1		1	2	2	1	1	1		1	2		
YBFL								2	2				2	2		
ALFL						1		2	2	2			1			
WIFL*																
LEFL	1	1		1		1	2	2	2		1					
HOLA*																
BLJA	1	1		3		2	1	1	2	1			1	1	1	
GRJA	1			3				3	1	1			1	1	1	
CORA		1		1			1	1	3		1		1			
AMCR	1			3		2	2	1	3	1			1	1	1	
EUST										1				1	1	
BOBO								1	1				2	1		
BHCO				1					1	1						

Appendix E (continued)

	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483
RWBB				3		2	2	2	3		1		3	1		
EAME																1
OROR*																
NOOR				2						1						
RUBL*				1		1		2	1							
COGR				3		3	2	2	2	1	1		3			
EVGR	1	1		3		1	2	3	2	1	1		1			
PIGR*				1												
PUFI	1			3		1	2	2	2	1	1			1		
HOFI																
RECR*									1							
WWCR*				1												
AMGO				3		1	1	1	1	1						
PISI	1			3		1	1	2	1		1					
VESP																
SASP										1						
GRSP*																
STSP*																
WTSP	1	1		3		2	2	2	3	3	1		2	2		
CHSP	1	1		3		1	2	2	1							
FISP																
DEJU	1	1		3		1	2	3	2	1	1			2		
SOSP		1		3		1	2	2	3	2			1			
LISP									1				1			
SWSP				3		2			3	2			3			
FOSP*																
RSTO																
NOCA																
RBGR	1	1		3		1	1	2	2	1	1			1		
INBU				1		1										
SCTA	1	1		1		1	1	2	2	1	1			2		
PUMA*																
CLSW								3	1				1			
BASW				3		3		3	3					1		
TRSW	1			3		1	2	1	3	1	1		1			
BASW								3	3							
NRWS																
CEWA	1	1		3		1	2	3	3	1			1			
REVI	1	1				2	2	1	2	1	1		2	2		
PHVI*				3												
WAVI																
YTVI*																
SOVI	1	1				2	1	3	3		1					
BAWW	1			3			1	2	2	3	1		2	2		
BWWA*																
NAWA	1	1				1	2	3	3		1		1	2		
TEWA	1	1				2	2	3	2	1	1			2		
NOPA	1	1		3		1	2	3	2	1	1		2	2		
CMWA	1			3		1	3	3	2		1			2		
YEWA						1			2				1			
BTBW	1	1				1		2	2		1		2	1		
YRWA	1	1		3		1	2	3	2	1	1		1	2		
MAWA	1	1				1	2	3	2		1		2	3		

	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483
CSWA		1		3		1	1	1	2	1			1			
BBWA	1	1		3		1	1	3	3	1	1					
BPWA*								3	1							
BLWA	1	1		3		1	2	3	3		1		2	2		
BTGW	1	1				1	2	3	3	1	1		2	2		
PIWA		1							3							
PAWA									3							
PRWA*																
OVEN	1	1		3		1	2	2	3	1	1		2	2		
NOWA				1		1	2		3					2		
LOWA*																
MOWA	1							3	2							
COYE	1	1		1		1	2	3	3		1		3	2		
WIWA								2	2				1			
CAWA	1			1		1	2		2		1		2	2		
AMRE	1	1		3		1	2	3	2	1	1			1		
HOSP																
WAPI*																
NOMO																
GRCA	1							2	2	1						
BRTH																
HOWR																
WIWR	1	1		3		2	1		2		1			2		
MAWR																
BRCR	1	1		3					1	1						
WBNU		1		3			1									
RBNU	1			3		3	2	2	1	1	1			1		
TUTI*																
BCCH	1	1		3		3	1	2	3	1	1			1	1	
BOCH				3					1							
GCKI		1				1		1	3					2		
RCKI	1			3		2	2	2	1	1	1			2		
BGGN*																
WOTH	1	1		2		1		1	3	1	1					
VEER	1	1		2		2	1	1	2		1		1	2		
GCTH*																
SWTH	1			3		2	2	1	2	1	1			1		
HETH	1			2		2			1	1	1		2	2		
AMRO	1	1		3		3	2	2	3	1	1		1	2	1	
EABL									1							

	484	488	489	490	491	492	493	494	495	496	497	498	499	501
PBGR*														
COLO			1	2			1	1	2	3				
ATPU*														
BLGU*														
RAZO*														
GBBG														
HEGU			1					1	1					
LAGU*														
RBGU*														
BOGU*														
COTE						3		1	3					
ARTE*														
ROTE*														
LETE*														
BLTE*														
LSPE*														
GRCO*														
DCCO														
COME			1			3	1		3	2	3			
RBME*														
HOME			3				3		3	1				
MALL														
ABDU			1				3	1		3	3		1	1
GADW*														
AMWI*														
GWTE							2							
BWTE							1							
NOSH*														
WODU			1				1							
RNDU							3		3	3	3	3		
COGO						3	3		3	2	3			
COEI*														
CAGO							1							
GLIB*														
AMBI			3				1		1		3		1	
LEBI*														
GBHE			1				1		2	1				
SNEG*														
TRHE*														
LBHE*														
CAEG*														
GRHE														
BCNH*														
VARA*														
SORA*														
COMO*														
AMCO*														
AMWO									1	2	3			1
COSN			2		1				1			1		
WILL*														
UPSA*														
SPSA			3	1	1			3	2	3	2		2	
KILL			3					3						1

	484	488	489	490	491	492	493	494	495	496	497	498	499	501
PIPL*														
SPGR								1	3	1	3			
RUGR			3		1	3		1	3	3	3	3	1	1
RNPH*														
WITU*														
RODO														
MODO														3
TUVU*														
NOHA														
SSHA									1	1	1			
COHA*									1					
NOGO											3	1	1	
RTHA								1						
RSHA									2	2				
BWHA					1			1	2	2	3		1	
BAEA									1	3				
AMKE				1	3		3	1	1					
OSPR			1				3	3	1	3				
LEOW*														
BAOW										2		1		
NSWO*									1				1	1
GHOW														
YBCU														
BBCU														
BEKI			1			1		2	3	3	3			
HAWO					1	1		2	2	2	3	3	1	
DOWO					1	1			2	3	2	1	1	1
BBWO			3		1	1		1	3	3	3			
TTWO*									1	1			1	
YBSS		1	3	1	3	1		1	3	3	2	3	1	1
PIWO	1		1			1		2	1	1	2	1	1	1
NOFL			1			1		1	2	2	2	3	1	
WHIP							1							
CONI								1		2	2	1		
CHSW			1		1	1		1	1	2		1		2
RTHU			1		1				1	1	2	1	1	
EAKI			1		1	3			3	3	3	1	1	
GCFL											1		1	
EAPH			1							1				2
OSFL			2		3	1	1	2	2	2	2	2	1	
EWPE					1	1		1	2	2	2		1	2
YBFL								2	2	2	2	2	1	
ALFL					1	1		1	2	2	2	2	1	
WIFL*														
LEFL			2		1	1		1	3	2	2	3	1	2
HOLA*														
BLJA			1		1	1		1	1	2	2	1	1	1
GRJA					1	1		3	3	3	3		1	1
CORA			3	1	1	1	3		3	3	1	1	1	1
AMCR			1		1	1		2	1	1	1	1	1	1
EUST			1										1	3
BOBO			2						1	2				1
BHCO			1						3	3		1		

	484	488	489	490	491	492	493	494	495	496	497	498	499	501
RWBB			2	1	3	1	1		2	2	2	1	1	2
EAME			1						1	1				
OROR*														
NOOR	1							1	1	1				2
RUBL*			1			1	1		2	2	2	1		
COGR			1	1	1	3		1	3	3	3	3	1	3
EVGR			1	1	1	1	1	2	3	3	3	3	1	
PIGR*							1				1		1	
PUFI		1	1	1	1	1	1	2	2	3	2	3	1	
HOFI														
RECR*									1	1	2			
WWCR*								1	1					
AMGO			1			1			1	2	2	1	1	
PISI			1		1	1		2	2	2	3	2	2	
VESP														
SASP									2	2	2	2		
GRSP*														
STSP*														
WTSP			2	1	3	3	1	3	3	3	3	3	1	2
CHSP		1	1			1	1	2	3	2	1	3	1	
FISP														
DEJU			1		1	1		2	3	3	3	3	1	
SOSP			1	1	1	3		3	2	2	3	2	1	3
LISP			2			1		1	1	2	2	1		
SWSP					1	1		3	2	1	1	2	1	2
FOSP*														
RSTO														
NOCA														
RBGR				1	1	1		2	3	3	2	3	1	
INBU														
SCTA				1				1	2	2	3	1	1	
PUMA*														
CLSW			3					3	3	3				
BASW	1	1	3		1	3		1	3	3	1	1	1	3
TRSW		1	1	1	3	3		3	3	2	1	3	1	3
BASW			1						3					
NRWS														
CEWA			1	1	1	1		2	3	3	3	1	3	
REVI		1	2	1	1	1	1		3	3	2	3	2	2
PHVI*											3	1	2	
WAVI														2
YTVI*														
SOVI					1	1	1	2	3	3	3	3	1	2
BAWW					1	1			2	2	2	1	1	2
BWWA*														
NAWA		1			1	1		2	3	3	2	2	1	
TEWA					3	1		2	3	3	2	3	1	
NOPA			2	1	2	1	1	2	3	3	2	2	1	
CMWA			2		1	1	1	2	3	3	2	3	1	
YEWA			2		1				1	1		3		
BTBW			1	1	1	1		1	2	2	2	1	1	
YRWA		1			1	1	1	2	3	3	3	2	1	
MAWA			1	1	1	1	1	2	3	3	3	2	1	

	484	488	489	490	491	492	493	494	495	496	497	498	499	501
CSWA				1	1	1		2	2	2	2		1	2
BBWA			1		1	1		2	3	3	3	3	1	
BPWA*						1			3	3	3	3	1	
BLWA			1		1	1		2	3	3	2	2	1	
BTGW			1		1	1	1	1	2	2	3	2	1	
PIWA														
PAWA									1	1	2	1		
PRWA*														
OVEN			2		1	1	1	1	3	3	2	3	1	2
NOWA					1	1		1	2	2	2	1	1	2
LOWA*														
MOWA		3			1	1		1	3	3	2		1	
COYE			2	1	1	1	1	3	3	3	3	3	1	2
WIWA					1	1		1	3	1	3	2	1	
CAWA					1	1	1	1	3	3	3	3	1	2
AMRE		1	2	1	3	1	1	2	3	3	3	3	1	2
HOSP														
WAPI*											3			
NOMO														
GRCA			1					1	2	1	1		1	
BRTH			1											
HOWR														
WIWR			1	1	1	1	1	2	3	3	3	2	3	
MAWR														
BRCR								2	2	3				
WBNU			1						1					
RBNU			3		1	1	1	2	2	1	1	2	1	
TUTI*														
BCCH			1	1	1			1	2	2	2	3	1	1
BOCH						2		2	3	3	3	3	1	
GCKI								2	3	3	2	3	1	
RCKI					1	1	1	2	2	2	2	2	1	
BGGN*														
WOTH					1	1			1	2	2	1	1	
VEER					1	1			2	2	2	2	1	2
GCTH*										1	2		2	
SWTH			1		1	1	1	2	2	2	3	3	1	
HETH					1	1		1	2	2	2	1	1	
AMRO			2	1	3	1		2	3	3	3	3	1	3
EABL								3						

Appendix E (continued)

	502	503	504	506	508	511	513	514	515	516	517	518	519
PBGR*													
COLO		1					1	2	2		2	1	
ATPU*													
BLGU*													
RAZO*													
GBBG													
HEGU													
LAGU*													
RBGU*													
BOGU*													
COTE													
ARTE*													
ROTE*													
LETE*													
BLTE*													
LSPE*													
GRCO*													
DCCO													
COME	1	1				1		3			1		
RBME*													
HOME	1							3					
MALL								1					
ABDU	2	1						2			1		
GADW*													
AMWI*													
GWTE													
BWTE													
NOSH*													
WODU		1						2					
RNDU	2							1			2		
COGO											3		
COEI*													
CAGO													
GLIB*													
AMBI	1												
LEBI*													
GBHE	1	1											
SNEG*													
TRHE*													
LBHE*													
CAEG*													
GRHE													
BCNH*													
VARA*													
SORA*													
COMO*													
AMCO*													
AMWO	3	1		1		2					2	2	
COSN	2									1			
WILL*													
UPSA*	3												
SPSA							1		2	2	1	2	
KILL	2	1						3	1				

	502	503	504	506	508	511	513	514	515	516	517	518	519
PIPL*													
SPGR	1	1					1				3		
RUGR	1	1					1	2		3	3		
RNPH*													
WITU*													
RODO	1												
MODO	1	1											
TUVU*													
NOHA	2												
SSHA								1				1	
COHA*													
NOGO											1		
RTHA		1	1				1		1	1			
RSHA													
BWHA	2						1			1	1		
BAEA				1									
AMKE	2								3	2			
OSPR		3		3									
LEOW*													
BAOW	1	1											
NSWO*	1												
GHOW	1												
YBCU	1												
BBCU	2												
BEKI	2	1								1	1		
HAWO	2					1	1					1	
DOWO	1						1		1		1		
BBWO	2				3		1			2	3		
TTWO*							1						
YBSS	2	1				1	2		1	1	1	2	
PIWO	2	1								1	2		
NOFL	2						3		2	1	1	1	
WHIP	1												
CONI	2									2			
CHSW	2					1	1				2		
RTHU	1	1					1						
EAKI	2									1	3		
GCFL	2												
EAPH	2												
OSFL	2					1	1		1	1	2		
EWPE	2					1	1		1		1	1	
YBFL	2	2							1		2		
ALFL	2					1	1		1	1	2		
WIFL*													
LEFL	2					1	1			1	1	1	1
HOLA*													
BLJA	2	1	1			1	1		1	2	2		
GRJA	3	1	1		2		3			3	2		
CORA	2						3		1	3	1	1	
AMCR	2									1	1		
EUST	2						1						
BOBO	2										2		
BHCO	2												

Appendix E (continued)

	502	503	504	506	508	511	513	514	515	516	517	518	519
RWBB	2						1			1	2		
EAME	1												
OROR*													
NOOR												2	
RUBL*									1		2		
COGR	2	1					1		1	1	2	3	
EVGR	2					1	1		1	1	3	2	
PIGR*													
PUFI	2	2				1	1		2	2	2	2	
HOFI													
RECR*													
WWCR*										1			
AMGO	2										2	2	
PISI	2					1	1			2	2	2	
VESP													
SASP	2												
GRSP*													
STSP*													
WTSP	2	2				1	2		2	2	2	2	1
CHSP	2	2				1	2		2	2	2	2	
FISP													
DEJU	3					1	2		2	3	2	2	
SOSP	2					1	2		2	1	1	1	
LISP	3						1		2	1	1	1	
SWSP	3									1	2		
FOSP*													
RSTO													
NOCA													
RBGR	2					1	1		1		2	1	
INBU		1									2		
SCTA	2									1	2		
PUHA*													
CLSW													
BASW	2			1		1	3		2	3	2	3	
TRSW	2					1	3		2	1	3	1	1
BASW													
NRWS													
CEWA	2					1	1		2	1	1	1	1
REVI	2	2				1	1		1	2	2	2	1
PHVI*													
WAVI											1		
YTVI*													
SOVI	2	2				1	1		2	1	2		
BAWW	2	2					1				2	1	
BWWA*													
NAWA	2	2				1	1		2	2	2	1	1
TEWA	2	2				1	1		2	2	2	1	
NOPA	2	2				1	1		2	2	2	1	
CMWA	2	2					1		1	2	2	1	
YEWA	2						2		1				
BTBW	2	1				1	1		1	1	2	1	
YRWA	3	2				1	1		1	2	3	1	
MAWA	2	2				1	1		2	2	3	1	

	502	503	504	506	508	511	513	514	515	516	517	518	519
CSWA	2					1	1		2	2	2	3	
BBWA	2					1	2		1	2	2	1	
BPWA*	2										2		
BLWA	2	2				1	1		1	2	2	1	
BTGW	2	2				1	1		1	2	1		
PIWA													
PAWA	2												
PRWA*													
OVEN	2					1	1	3	1	1	2	2	1
NOWA	2	2					1		2		2	1	
LOWA*													
MOWA						1	1		1	1	2	1	
COYE	2	2					2		2	2	2	2	
WIWA							1		1	1			
CAWA	2	2				1	1		2	2	2	1	
AMRE	2					1	1		2	1	2	2	
HOSP													
WAPI*													
NOMO	1												
GRCA	2						1					2	
BRTH													
HOWR													
WIWR	2	2				1	1		2	2	2	1	
MAWR													
BRCR	1							3		2	2	1	
WBNU		1								1			
RBNU	2	2				1	1		1	2	3	1	
TUTI*													
BCCH	2	1					1		1	1	2	1	
BOCH	2						1			2	3		
GCKI	2								1	2	2	1	
RCKI	3	2				1	1		2	2	2	1	
BGGN*													
WOTH	2										2	1	
VEER	3						1			1	2	3	1
GCTH*													
SWTH	2					1	1		2	2	2	2	1
HETH	2	1					1		1	1	2		
AMRO	2	1	1			1	1		2	2	2	3	1
EABL	2			1									

Appendix E (continued)

	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537
PHGR*						3	2											
COLO		2	3		3	3	3	3					1	1	1		2	2
ATPU*																		
BLGU*																		
RAZO*																		
GBBG																		
HEGU														1	1		3	1
LAGU*														1				1
RBGU*																		
BOGU*														2				
COTE		1												1	1		2	3
ARTE*																		
ROTE*																		
LETE*																		
BLTE*																		
LSPE*																		
GRCO*																		
DCCO																		
COME		3						1					3	3			3	3
RBME*																	1	3
HOME					1	1		3										
MALL						1		2										
ABDU			1		1	3	3	3					3	3			1	2
GADW*																		
AMWI*																		
GWTE						1		1										
BWTE						3		3										
NOSH*																		
WODU					1	2	3	3										
RNDU						3	3	3						3				2
COGO						1		3										
COEI*																		
CAGO																		
GLIB*																		
AMBI		1				2		2					1	1				1
LEBI*																		
GBHE		3	1		1	1	1						1	1			1	3
SNEG*																		
TRHE*																		
LBHE*																		
CAEG*																		
GRHE																		
BCNH*																		
VARA*																		
SORA*																		
COMO*																		
AMCO*																		
AMWO		2	1	1			3	2	2					1				
COSN	3					2		2	2	1			1				2	
WILL*																		
UPSA*																		
SPSA		3				1		3					3	3	3		1	2
KILL		3		1	1		1	2	1				3	3	3			

	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537
PIPL*																		
SPGR		1						1										3
RUGR		3	1	1	1	2	3	3	2	3			3	3		1	2	2
RNPH*																		
WITU*																		
RODO			1	1				3										
MODO		1	1	1			2	2										
TUVU*																		
NOHA							3											
SSHA		2				1		1					1	1				
COHA*													1					
NOGO															3			
RTHA		1						1						1				2
RSHA																		
BWHA		2						2	1	1			1	1	1		2	3
BAEA														1	3			
AMKE		1					3	2		1			1			1	1	
OSPR				1	1	1		3	1				1	3	1	3	3	1
LEOW*																		
BAOW				1	1			1						1			2	
NSWO*		1	1	1	1				1	1								2
GHOW			1	1				1										1
YBCU																		
BBCU						2		2	3									
BEKI		3	1			2		3					3	3	3		1	2
HAWO		1						2	1		1	1	1	1				2
DOWO	1	1	1					2	1	1			3	3			3	2
BBWO								2	1					1			1	2
TTWO*																	2	
YBSS	1	3						3		1	1		3	3			3	2
PIWO	1	2			1		2	3					3	3			1	2
NOFL	1	2						2	1	1			1	1	1		1	2
WHIP		2																
CONI								2	1									2
CHSW		1						2	1		1		1	1	1		1	1
RTHU		2	1	1			1	1	1	1			1	1			1	
EAKI	1	3				3		2	3				3	3		1	2	2
GCFL	1						2	2			1							
EAPH								3										2
OSFL	1						2	2	1	1	1	1	2	2				2
EWPE	1	1					2	2		2	1		2	2			2	2
YBFL		2							1		1		2	2				2
ALFL		1					2	2	1	1		1	3	1			2	2
WIFL*																		
LEFL	1	2				2		2	2	2	1		2	2			2	2
HOLA*																		
BLJA	1	2	1	1	1		3	3	1	1	1	1	3	3			1	2
GRJA	1	1	1	1			1	2		1			1	1			1	2
CORA	1	1			1		2	2	1	1			3	3	1		1	2
AMCR		1	1	1			2	2	1	1				1			1	2
EUST		3					2		3									
BOBO		2	1				2	2					1	1	1			
BHCO		1					2	2	1	1								

Appendix E (continued)

	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537
RWBB		2	1	1		2	2	3	3				3	3	1		3	2
EAME					2													
OROR*																		
NOOR		2		1	1		3	3										
RUBL*													3	3			1	
COGR	1	3				2	2	3	3	1	3		3	3	3		3	3
EVGR	1	2					2	2	1	1	1	1	3	3	1		1	2
PIGR*									1	1								
PUFI	1	2					2	2	1	1	1	1	3	3	1		2	2
HOFI																		
RECR*																		
WWCR*													1					
AMGO		1					2	2	1				3	1				2
PISI		1											1	1	1			2
VESP																		
SASP		2						1					3		1	3		
GRSP*																		
STSP*																		
WTSP	1	3				2		2	3	3	2	1	3	3	2	3	3	3
CHSP	1	3				2	2	3	3	1	2	1	3	3	1		3	3
FISP																		
DEJU		3						2	3	3	1	1	3	3	1		2	2
SOSP		2					2	3	3	2			3	3	2		2	3
LISP	1								3	2	1		3	3		1	2	2
SWSP												1	2			3	2	2
FOSP*																		
RSTO																		
NOCA																		
RBGR	1	3				2	2	3	2	1	1	1	3	3	1		2	3
INBU																		
SCTA	1	1					2	2		3	1	1	1	2				2
PUMA*																		
CLSW		3							1				3	1			3	3
BASW	1	3					3	3	3	1			3	3	3		3	3
TRSW	1	3				2	2	3	3				3	3	1		1	3
BASW					3			3										
NRWS																		
CEWA	1	2					2	2	3	3			1	3	1		3	3
REVI	1	2					2	2	3	3	1		3	3	2		3	3
PHVI*																		
WAVI		2						2										2
YTVI*																		
SOVI	1	2				2	2	2	1	1	1	1	2	3			3	3
BAWW		2				2	2	2	3								2	2
BWWA*																		
NAWA	1	2					2	2	1	1	1	1	3	3			2	3
TEWA	1						2	2	3	3		1		2			2	2
NOPA	1	2					2	2	2	1	1		2	2	2		3	3
CMWA							2	2	2	1	1						3	2
YEWA		3					2	3	1								1	
BTBW		3						2	2	1	1		2	2			2	2
YRWA	1	2					2	2	2	3	3	1	3	3			3	2
MAWA	1	3					2	2	2	1	3	1	3	3			3	3

	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537
CSWA	1	2					2	2	1	3			2	2			1	2
BBWA	1	2						2	1	1			3				3	2
BPWA*		1					2					1		1			2	2
BLWA	1	2					2	2	3	1	1	1	3	1			3	3
BTGW	1	2					2	2	2	1	1		1	1			2	2
PIWA																		
PAWA														1				2
PRWA*																		
OVEN	1	3				2	2	2	1	2	3	1		2	2		2	2
NOWA	1	2				2	2	2	1	2	1	1	3	2		1	1	2
LOWA*																		
MOWA		3							1	3	1		1	2			1	2
COYE	1	3				2	2	2	3	3	1	1	3	3	2	3	3	3
WIWA													1					
CAWA								2	2	3	1		2	2			2	1
AMRE	1	3					2	2	3	3	1	1	3	2	2		2	2
HOSP		3					2											
WAPI*																		
NOMO																		
GRCA		2						2	3	1		1		1	1			2
BRTH								2										
HOWR																		
WIWR	1	2						2	1	1	1	1	2	2	2		2	2
MAWR																		
BRCR		1							1	1			3	1				
WBNU		1						2										
RBNU	1	1						2	1		1		3	3			3	3
TUTI*																		
BCCH	1	3					2	2	1	1	1		3	3			3	3
BOCH								1	1	1			2				1	2
GCKI		2						1	1		1		2	1			2	2
RCKI	1	1					2	2	2	1			2	1			2	2
BGGN*																		
WOTH	1	1					2	2	3	2	1	1		1			3	
VEER	1	2				2	2	2	2	2	1	1	2	2	2		2	3
GCTH*																		
SWTH	1	2					2	2	2	1	3	1	2	3	2		2	3
HETH		1					2	2	1		1		3	2			2	2
AMRO	1	3			2	2	2	3	3	3	3	1	3	3	2		3	3
EABL													3					

Appendix E (continued)

	538	539	540	541	542	543	544	545	546	547	548	550	551	552	553	554	555
PBGR*																	
COLO	2	1	3	3	3						3			3	1		3
ATPU*																	
BLGU*																	
RAZO*																	
GBBG																	1
HEGU																	3
LAGU*																	1
RBGU*																	
BOGU*																	3
COTE																	3
ARTE*																	
RUTE*																	
LETE*																	
BLTE*																	
LSPE*																	
GRCO*																	
DCCO																	
COME		1	3	3									3	3	1		3
RBME*																	3
HOME				3				1			3						3
MALL	1									1	2				1		
ABDU	1	1	1	3				1		3	3	1	1		1		3
GADW*																	
AMWI*																	
GWTE				1						1							1
BWTE	1																1
NOSH*																	
WODU			3	3							3	1			1		3
RNDU				3				1									3
COGO	1		1								3			3			3
COE1*																	
CAGO			2						1		3						
GLIB*																	
AMBI				1			1			1					1		2
LEBI*																	
GBHE	1	1	3	1								1	1	1	3		2
SNEG*																	
TRHE*																	
LBHE*																	
CAEG*																	
GRHE																	
BCNH*																	
VARA*																	1
SORA*																	
COMO*																	
AMCO*																	
AMWO		1	2		1	1			2	2	2		1		2		2
COSN		1	1	2				2	2	2	2						1
WILL*																	
UPSA*								2									
SPSA	1		3					1		2	3	3	1	2	2		2
KILL			3				1	2	1	3	3						1

	538	539	540	541	542	543	544	545	546	547	548	550	551	552	553	554	555
PIPL*																	
SPGR	1				1	1							1	3	3		2
RUGR	1	3	3		1	3	1			3	3		2	3	3		3
RNPH*									1								
WITU*																	
RODO								2	2	1	3						
MODO					1			1	2	2	2						
TUVU*																	
NOHA					1			2	1	1	2						1
SSHA										1			1		1		1
COHA*										1					1		
NOGO	1									1					3		3
RTHA					1	1							1	1	2		1
RSHA																	
BWHA	1	1	3							2	3		1	1	1		1
BAEA																	1
AMKE	1		1							3	3		1		2		1
OSPR		1	3	3	1	1				1			1	1			2
LEOW*																	
BAOW		1								1							2
NSWO*					1					1						1	
GHOW					1			1					1		2		2
YBCU																	
BBCU							1	2	1	2	3						
BEKI	1	1	2	1				1	1	2	2	3	3	1	3		3
HAWO		3	2				1	2		3	2	1	3	1	3		1
DOWO		3	2	1				1		2	2	1			1		3
BBWO	1	1	1	1									2		3		3
TTWO*											1		1				3
YBSS	1	3	2	1						2	3	1	3		2		1
PIWO	1	1	2	1			1		1	3	2		2		3		3
NOFL	1	3	3	1				2	2	2	3	1	3	1	3		1
WHIP			2														2
CONI			1								2		2		2		
CHSW		1	1				1	2	2		2		1		2		1
RTHU	1	1	2							2	2	1	1		1		2
EAKI			3	1				2	2	3	2	1	3	1	1		3
GCFL		2	2	1				1		2	1		1		1		1
EAPH		2	3				1	2	2	3	2						1
OSFL		2	1	1			1		1	2	1		3	1	3		1
EWPE		2	1	1			1	2	2	2	2	3	3	1	2		2
YBFL			2	1						2			2		2		2
ALFL		2		1			1	2	2	2	2		3	1	3		2
WIFL*				1													
LEFL	1	2	2	1			1	2	2	2	2	1	2	1	2		1
HOLA*										1							
BLJA	1	2	1	1	1		1	2	2	2	2	1	1	1	3		2
GRJA	1	3	3		1	1	1						1		3		3
CORA	1	1	1	1			1	2	2	2	2		1	1	1		3
AMCR		1	2		1	1	1	3	2	3	2		1	1	1		1
EUST			1				1	2	2	3	3	1	1		1		
BOBO		1	2	2	1		1	2	2	3	2						
BHCO		1	2				1	2	2	3	2	1	3		1		1

Appendix E (continued)

	538	539	540	541	542	543	544	545	546	547	548	550	551	552	553	554	555
RWBB	1	3	1	3			1	2	2	3	3	3	3	3	3		3
EAME										1							
OROR*																	
NOOR		2	1						1	2	2						
RUBL*								1			2		3		3		3
COGR	1	3	1	3				2	2	3	2	1	3	1	3		3
EVGR	1	1	2	1	1		1	2	2	3	2	1	1	1	2		2
PIGR*										1			1		1		
PUFI	1	3	3	1			1	2	2	3	2	1	3	1	3		2
HOFI																	
RECR*																	
WWCR*																	
AMGO	1	2	3				1	2	2	2	2	1	1	1	1		1
PISI			1	1				2		1		1	1		3		2
VESP								2		2							
SASP				3			1	2	1	2	2						
GRSP*																	
STSP*																	
WTSP	1	3	3	1			1	2	2	3	1	1	3	2	3		3
CHSP	1	3	3	2			1	2	2	2	2	3	3	3	3		3
FISP																	
DEJU	1	2	1	1	1		1	1		2	1		3	1	3		2
SOSP		2	3	1	1		1	2	2	3	2	1	3	2	2		2
LISP		1		1			1	1				1	3	1	3		
SWSP	1	2		1			1	2		2		1	3	2	2		1
FOSP*													2				
RSTO																	
NOCA																	
RBGR	1	3	3	1			1	2	2	3	2	1	3	1	3		2
INBU																	
SCTA		2	2				1	2	1	2	2	3	1		1		2
PUMA*																	
CLSW		3	3					2		3				2			1
BASW		3	3	1			1	2	2	3	3	3	3	3	3		3
TRSW	1	3	3	3			1	2	2	3	3	3	3	3	3		3
BASW		1						1		3	3				1		
NRWS															2		
CEWA	1	3	3	1			1	2	1	3	3	1	3	1	3		1
REVI	1	2	2	3			1	2	2	2	2	3	3	1	2		2
PHVI*	1	3					1	2				1	1		1		2
WAVI							1	1		2	2						
YTVI*																	
SOVI		2	1	3			1	2	2	2	2	1	3	1	3		2
BAWW		3	1	1	1		1	2		3	2	1	1		1		2
BWWA*																	
NAWA		2	2	1			1	2	1	2	2	1	2	1	2		2
TEWA		2	1	1			1	2	2	2	2	3	3	1	3		2
NOPA		2	2	1			1	2	2	2	2	1	3	1	2		2
CMWA		1		3			1	2		2	2		2	1	2		1
YEWA			1				1	2	2	2	3	1					1
BTBW	1	2	1	1			1	2		2		1	2	1	2		1
YRWA	1	3	1	1			1	2	1	2	2	1	3	1	2		2
MAWA	1	3	3	3			1	2		2	2	1	3	3	3		2

	538	539	540	541	542	543	544	545	546	547	548	550	551	552	553	554	555
CSWA	1	3	1	1			1	2	2	2	2		3	1	3		1
BBWA		1	1				1	2				1	2		2		2
BPWA*							1	2			2		2		3		
BLWA	1	3	1	1			1	2	2	2	2	1	2	2	2		2
BTGW		2		1			1	2	2	2	2	1	2	1	2		2
PIWA										1							2
PAWA				1				1					1		1		1
PRWA*																	
OVEN	1	3	2	1			1	2	2	3		1	2	1	2		2
NOWA	1	2	1	2			1	2	2	2	2	1	3		2		2
LOWA*																	
MOWA			1							2			2	1	2		1
COYE	1	2	1	1			1	2	2	2	2	1	3	1	3		3
WIWA				1			1	1	1				2		3		2
CAWA	1	2	1	1			1	1		2		1	3	1	3		1
AMRE	1	3	2	1			1	2	2	3	2	3	3	1	3		2
HOSP								2	2	3	3						
WAPI*																	
NOMO										1							
GRCA		1	3				1	1	1	3	2	1	1	1	2		1
BRTH																	
HOWR																	
WIWR		2	1	1			1	2	1	2		1	2	1	3		2
MAWR																	
BRCR	1		1							2			2		3		2
WBNU																	
RBNU	1	3	2	1			1	3		2	2	3	3	1	3		1
TUTI*																	
BCCH	1	3	1	1	1		1	2	2	3	3	1	2	1	3		1
BOCH	1	1		1				1		2			3		2		1
GCKI		1	1	1			1	2		2		1	2		2		2
RCKI		2	2	1			1	2		2	2	1	2	1	3		3
BGGN*																	
WOTH		3	3	1			1	2	2	2	2	1	2		2		1
VEER		2	3	1			1	2	2	2	2	1	2	1	2		2
GCTH*																	
SWTH		2	1	1			1	2	1		2	1	3	1	2		2
HETH			3	1			1	2	2	3	1	1	2	1	3		1
AMRO	1	3	3	1	1		1	3	2	3	3	3	3	3	3		3
EABL									3								

Appendix E (continued)

	556	557	558	559	560	561	562	563	564	565	566	567	568	569	571	572	573
PBGR*																	
COLU	3	3	1		3	3	3	3	1							1	
ATPU*																	
BLGU*																	
RAZU*																	
GBBG																	
HEGU					1	3	3	3								2	
LAGU*							1	1									
RBGU*																	
ROGU*																	
COTE	1		2		1	3	1										
ARTE*																	
ROTE*																	
LETE*																	
BLTE*																	
LSPE*																	
GRCO*																	
DCCO																	
COME					3	3	3	3	3						1	1	
RBME*		1				1											
HOME													1				
MALL																	
ABDU					2	1	1		1				2				
GADW*																	
AMWI*																	
GWTE																	
BWTE								3									
NOSH*																	
WODU					3	3							1				
RNDU						3	3	3					2				
COGO						3	3	3									
COEI*																	
CAGO																	
GLIB*																	
AMBI		1	1			2		1					1				
LEBI*																	
GBHE					1	1			1								
SNEG*																	
TRHE*																	
LBHE*																	
CAEG*																	
GRHE								1									
BCNH*																	
VARA*																	
SORA*																	
COMO*																	
AMCO*																	
AMWU						3									2		
COSN		2	2			1											
WILL*																	
UPSA*																	
SPSA					3	3	3		1						2	1	
KILL						1											

	556	557	558	559	560	561	562	563	564	565	566	567	568	569	571	572	573
PIPL*																	
SPGR					3	3											
RUGR	1				3	3	3	3	1	1	1	1	3	3			
RNPH*												3					
WITU*																	
RODO																	
MODO																	
TUVU*																	
NOHA																	
SSHA						1	1										
COHA*					1	1											
NOGO																	
RTHA					1	1	1	1									
RSHA																	
BWHA						1	2										
BAEA	3				1	1	1	1									
AMKE																	
OSPR	1				1	1	3	1								2	
LEOW*																	
BAOW						1											
NSWO*																	
GHOW						1											
YBCU																	
BBCU																	
BEKI	1				1	1	1	1		1							
HAWO		3			1	3											
DOWO		1			1	1											
BBWO	2	3			3	3	1										
TTWO*						1											
YBSS		3	1	1		1	2			1							
PIWO		1				1	1			1		1	1	1			
NOFL		1			1	1	1	1									
WHIP																	
CONI						1											
CHSW	1		1			1	1										
RTHU						1	1			1							
EAKI	2				3	3	3	3	3								
GCFL						1											
EAPH					2		1	1	1								
OSFL		2				2	2										
EWPE						3	3			1							
YBFL		1				1											
ALFL		1								1							
WIFL*																	
LEFL		2				2	2			1							
HOLA*																	
BLJA		1			1	1	2	1		1		3	1	1			
GRJA	3					1						1	1	1			3
CORA		1			2	2	2			1			1				
AMCR						1				1			1				
EUST						1											
BOBO									1								
BHCO						1				1							

Appendix E (continued)

	556	557	558	559	560	561	562	563	564	565	566	567	568	569	571	572	573
RWBB		2			2	2	3	3	1	1							
EAME																	
OROR*																	
NOOR																	
RUBL*		2				1											
COGR		1	3		1	3	2	3	3								
EVGR			1	1	1	1	2	1		1						2	
PIGR*																	
PUFI		1	1	1	1	3	1			1							
HOFI																	
RECR*																	
WWCR*																	
AMGO						1	2										
PISI			1			1				1							
VESP																	
SASP									1								
GRSP*																	
STSP*																	
WTSP		2	3	1	2	3	2	2	1	1					2		
CHSP			1		1	3	2	1		1							
FISP																	
DEJU		3	1		1	3	2	1		1							
SOSP		2	1		1	2	2	1									
LISP						2			1								
SWSP		2				1			1								
FOSP*																	
RSTO																	
NOCA																	
RBGR		1	2	1		3	2	2		1							
INBU																	
SCTA			1		1	3	2			1							
PUMA*																	
CLSW		3			1												
BASW					3	3	3		1				1	1	3		
TRSW		1	1		3	3	3	3							3		
BASW					1	1											
NRWS																	
CEWA		1	1		3	3	3	3									
REVI			2		1	2	2			1							
PHVI*										1							
WAVI																	
YTVI*																	
SOVI		2	2		1	2				1							
HAWW			2		1	3	2	1									
BWWA*																	
NAWA			2		1	3	1	1		1							
TEWA		1	1	1	1	2	2			1							
NOPA		1	1		2	3	2	2		1							
CMWA				1	1	1	2										
YEWA					1	2		1									
BTBW			1		1	1	2	2		1							
YRWA		2	2		2	3	2	2		1							
MAWA		2	3	1	1	3	3			1							

	556	557	558	559	560	561	562	563	564	565	566	567	568	569	571	572	573
CSWA			1		1	3	2			1							
BBWA		3	2		2	2	2			1							
BPWA*										1							
BLWA		2	2	1	2	2	2	2		1							
BTGW		2	2	1		2	2			1							
PIWA							2										
PAWA						3	1		3								
PRWA*																	
OVEN			2	1	1	1	2			1							
NOWA			1		2	2	2			1							
LOWA*																	
MOWA			2			1	1			1							
COYE		3	2	1	1	3	2	1	3	1							
WIWA						1				1							
CAWA		2	3	1	1	2	1			1							
AMRE			2		2	3	2			1							
HOSP																	
WAP1*																	
NOMO																	
GRCA						1		1									
BRTH																	
HOWR																	
WIWR		2	2	1	1	2	1			1							
MAWR																	
BRCR					1	1	1	1									
WBNU																	
RBNU		1	3		1	1	2	2		1							
TUTI*																	
BCCH		1	1		1	1	1	1	1	1							
BOCH						3											
GCKI			1		2	3	1			1							
RCKI		3	2		1	1	2	1		1							
BGGN*																	
WOTH						1	2										
VEER					1	2	1			1							
GCTH*																	
SWTH		2	2	1	2	2	2			1							
HETH			1	1	1	2	2			1							
AMRO		1	3	1	2	3	3	1		1							
EABL																	

Appendix E (continued)

	574	576	577	578	581	582	588	590	591
PBGR*							1		
COLO		1	1	3					
ATPU*									
BLGU*									
RAZO*									
GBBG									
HEGU		1		2					
LAGU*							1		
RBGU*									
BOGU*									
COTE							1		
ARTE*									
ROTE*									
LETE*									
BLTE*									
LSPE*									
GRCO*									
DCCO									
COME		1		3					
RBME*				3					
HOME				1	1		3		
NALL			1				1		
ABDU			3	1			3		
GADW*									
AMWI*									
GWTE									
BWTE							1		
NOSH*									
WODU				2					
RNDU			3	1					
COGO		1	1						1
COEI*									
CAGO									
GLIB*									
AMBI		1	1						
LEBI*									
GBHE		1		1			1		1
SNEG*									
TRHE*									
LBHE*									
CAEG*									
GRHE									
BCNH*									
YARA*									
SORA*									
COMO*									
AMCO*									
AMWO		1	1				1		
COSN		1					1		
WILL*									
UPSA*									
SPSA		3		3	1		1		3
KILL				1		1	1		3

	574	576	577	578	581	582	588	590	591
PIPL*									
SPGR			3	3					1
RUGR		1	3	3		1			3
RNPH*									
WITU*									
RODO							1		
MODO						1	1		
TUVU*									
NOHA							1		1
SSHA							1		
COHA*		1							
NOGO		1	1						
RTHA						1		1	1
RSHA									
BWHA		1	1	1					2
BAEA				1					1
AMKE				2		1	1		
OSPR	3	1	1	2			1		2
LEOW*									
BAOW				3					
NSWO*									
GHOW				2					
YBCU									
BBCU							3		1
BEKI		1		2	1		1	1	3
HAWO		3	1	2			1		1
DOWO		3	3	2			1		1
BBWO		3	1	3				2	1
TTWO*									
YBSS		3	3	3			3		2
PIWO		2	1	3					1
NOFL		3	1	3	1	1	3	1	2
WHIP		2							
CONI		1						1	2
CHSW		1	1	1			1		2
RTHU		1		3			1		1
EAKI		3		3			3		1
GCFL							1		
EAPH				1			1		
OSFL		2	2	2			2		
EWPE		2	1	2			1		
YBFL			1				1		2
ALFL		2	2	2			3	2	2
WIFL*								1	
LEFL		3	2	2			1	2	1
HOLA*							1		
BLJA		1	2	1			1	2	2
GRJA				1			1	2	1
CORA		1	2	1	3		1		2
AMCR		1	1	1			1	1	1
EUST		3		3			3		
BOBO						1	3		
BHCO				3			1		

Appendix E (continued)

	574	576	577	578	581	582	588	590	591
RWBB		3	2	2	1		3	2	
EAME									
OROR*									
NOOR							1		
RUBL*					1				
COGR		3	2	3			3	2	3
EVGR		1	1	3	1		1	1	2
PIGR*				1					
PUFI		3	1	2	1		1	1	3
HOFI									
RECR*									
WWCR*		1	1				1		
AMGO				2			1		
PISI			1					1	1
VESP							1		
SASP							1		
GRSP*									
STSP*									
WTSP		3	3	3	1		2	2	3
CHSP		2	2	3	1		3	1	3
FISP									
DEJU		3	2	3	1	1		2	3
SOSP		3	1	3		1	3	1	3
LISP							1		3
SWSP			2	2			2		
FOSP*									
RSTO									
NOCA									
RBGR		3	3	3	1		1	2	2
INBU							1		
SCTA		2	1	1			3		
PUMA*									
CLSW		3		3			1		
BASW		3	1	3			3	1	3
TRSW		3	2	3			1		2
BASW		1		1			1		3
NRWS							1		
CEWA		2	2	3	1		1		2
REVI		2	2	3	1		1	1	3
PHVI*				1					
WAVI				2			1		
YTVI*									
SOVI			3	2			2	2	2
BAWW		2	1	2		1	3	2	2
BWWA*									
NAWA		2	2	2		1	2	2	3
TEWA		2	1				1	2	3
NOPA		3	2	2	1		1	2	2
CMWA			1				1	2	3
YEWA		3		2			3		
BTBW		2	1	1					
YRWA		2	2	3	1		1	2	3
MAWA		3	2	3			3	2	3

	574	576	577	578	581	582	588	590	591
CSWA		2	2	3			1	1	
BBWA		3	1	1				1	2
BPWA*									
BLWA		3	2	3	1		3	1	3
BTGW		2	1	2	1			1	2
PIWA									
PAWA				1					
PRWA*									
OVEN		3	3	2			3	2	3
NOWA		2		2	2		1	2	1
LOWA*									
MOWA		3	2	1	1				2
COYE		3	2	3	1		3	2	3
WIWA			1	2					2
CAWA		3	1	1			3	1	3
AMRE		2	3	2	1		3	2	3
HOSP							3		
WAPI*									
NOMO									
GRCA				2	1		1		3
BRTH									
HOWR									
WIWR		3	2	2	1		2	1	2
MAWR									
BRCR		3	1	2					
WBNU									
RBNU		3	2	2			1		2
TUTI*									
BCCH		3	3	3		1	1	2	1
BOCH			1	3			1		3
GCKI		2	1				2	1	2
RCKI		3	2	1			1	1	3
BGGN*									
WOTH		2	2	2	1		1		2
VEER		2	2	2	1		3	2	2
GCTH*									
SWTH		2	2	2	1			2	3
HETH		3	1	2			1	1	3
AMRO		3	3	2	1		3	2	3
EABL									

Appendix E (continued)

	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	609
PBGR*														3			
COLO	1	3	1	2	1		3	2				1	1	3			
ATPU*																	
BLGU*																	
RAZO*																	
GBBG																	
HEGU			1														
LAGU*																	
RBGU*																	
BOGU*																	
COTE				1													
ARTE*																	
ROTE*																	
LETE*																	
BLTE*																	
LSPE*																	
GRCO*																	
DCCU																	
COME	1	3	3	3			3	2				3		1	1	3	
RBME*																	
HOME			1	1	1						3						
MALL	1	3					3							1			
ABDU		1	1	3			3	3	3	3	1	1	1	3		1	
GADW*																	
AMWI*																	
GWTE				1			3				3			3	3		
BWTE				1			3				3			3			
NOSH*																	
WODU	1	1		1			3	3			3	3		3		3	
RNDU				1			2							3			
COGO				3			3	3			3						
COEI*																	
CAGO				3			3										
GLIB*																	
AMBI		2	1	1			2	2			1						
LEBI*																	
GBHE	1	1	1	1			1	1							1		
SNEG*																	
TRHE*																	
LBHE*																	
CAEG*																	
GRHE											1						
BCNH*																	
VARA*																	
SORA*											3			1			
COMO*																	
AMCO*																	
AMWO		2		2			2	2									
COSN		2	1	2		1	2				2	1					
WILL*																	
UPSA*																	
SPSA		1	1	3			3		1						3		
KILL		3					1				1				3		

	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	609
PIPL*																	
SPGR	1	3		1			2	3	1					1	1		
RUGR	1	3		2		1	3	3		2	1				3	1	
RNPH*																	
WITU*																	
RODO															1		
MODO											1	1			3		
TUVU*																	
NOHA							1	1				1			1		
SSHA				1			1	1							1		
COHA*																	
NOGO		1															
RTHA	1	1		1			1	1							1		
RSHA																	
BWHA		1				1	1	1							1		
BAEA		1	1			1	1	1									
AMKE		1					1	1			1				3		
OSPR	1	2		2			1	1									
LEOW*																	
BAOW							2	2							1		
NSWO*		2															
GHOW																	
YBCU																	
BBCU											1				1		
BEKI	1	3	1	2			3	1	2		1				1		
HAWO	2	3	1	1			1	1			1				1		
DOWO	1	1	1	1		1	1	1							3		
BBWO		2	2	3		3	1	1							1		
TTWO*		1	1	1		1	1										
YBSS	1	2	1	1			3	1			1				1	1	
PIWO	1	1	1	1		2	2	1			3				1		
NOFL		1	1				1	1		1	1				2		
WHIP																	
CONI		1													1		
CHSW		3	1				1	1							1		
RTHU		2					1	1							1		
EAKI		2		2			3	3			3				2		
GCFL																	
EAPH		1													3		
OSFL	1			2	1		2	2									
EWPE				1		1				2	1	1			3	1	
YBFL			2			2					1						
ALFL		1				1			2		1				1		1
WIFL*																	
LEFL	1	1	1	2			2		2		1				1		
HOLA*																	
BLJA	2	3	2	1	1	1	2	2			1				3		
GRJA	1	2	1	1		2	3	3				1	1				1
CORA	1	2	1	2		1	2	1			1				1		
AMCR	1	2	1	1			1	1			1				3	1	
EUST	1	3		1					3	3	1				3	1	
BOBO		2					1				1				3		
BHCO							1	1			1				1		

Appendix E (continued)

	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	609
RWBB	1	3	1	3			2	2	2		1				3	1	
EAME																	
OROR*																	
NOOR											1				3		
RUBL*				2				1									
COGR	2	2	2	3			2	1			1				3		
EVGR	2	2	2	3	1	2	1	1	2	2	1				1		
P1GR*		1		1		1											
PUFI	2	2	1	1		2	2	2			1				3		
HUFI																	
RECR*																	
WWCR*																	
AMGO		3					2	2			1				1		
PISI	1	1	1	1	1	1	2								1		
VESP											1					1	
SASP				2							1	1			2		1
GRSP*																	
STSP*																	
WTSP	2	3	2	2	1	2	3	2	2	2	1	1			3	1	3
CHSP	1	2	1	1		1	2	2			1				3		
FISP																	
DEJU	2	3	2	3		3	2				1				3	1	1
SOSP		2		2		1	1		2		1	1			3		
LISP		3					2								3		1
SWSP			1	2			3	2							3		1
FOSP*																	
RSTO								2									
NOCA																	
RBGR	2	2	1	1		1	2	2	2	2	1				1	1	
INBU											1				1	1	
SCTA	2	1		1			2			2	1				3	1	
PUMA*																3	
CLSW		3													3		
BASW	1	3	2	1		1	3	3		3	3				3		
TRSW	1	3		2			3	3	1		1				3		
BASW																	
NRWS																	1
CEWA		2	2	2		1	1	1			1				1		
REVI	2	3	1	1			2	2			1	1			1	1	
PHVI*															1	1	
WAVI				2													
YTVI*																	
SOVI	2	2	2	2		1	2		2						1		
BAWW	2	2		1			2	2			1				1		
BWWA*																	
NAWA	2	2	1	1		2	2	2			1				2		
TEWA	2	2	2	2	1	2	2	2	2	2					1		
NOPA	1	2	1	2	1	1	3	2	2	2	1				1		1
CMWA		1	2	1	1	2	2	2							2		
YEWA										2	3				3		
BTBW	1	3		1		1	2	2		2	1				2	1	
YRWA		2	2	1		2	3	2			1						1
MAWA	2	2	1	1	1	2	2	2	2		1				3		

	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	609
CSWA	2			1			2	2		2	1				3	3	
BBWA	1	2	2	2	1	2	2	2							2		
BPWA*							1										
BLWA	1	3	2	1	1	3	3	2	2		1				2		
BTGW	1	1	1	1		1	2	2		2					2	1	
P1WA																	
PAWA																	
PRWA*																	
OVEN	2	3	1	1		1	2	2	2	2	1				1	2	
NOWA		2	1			2	2	2			1				2		
LOWA*																	
MOWA	2	3	1	1	1	1	2	2	2		1				3		
COYE	2	3	1	1	1	2	3	2			1	1			2		1
WIWA	2	2		1			1										
CAWA	2	3	1	2		1	2	2			1	1			2		
AMRE	2	2	1	1		1	2	2			1				1	1	
HOSP															3		
WAPI*																	
NOMO		2															
GRCA		2					1	1			1	1			3		
BRTH																	
HOWR		3															
WIWR	1	2	2	1	1	2	2	2			1				2		
MAWR																	
BRCR			2	2		2	1	1			1				1		
WBNU																	
RBNU	1	2	1	1		1	2	1	2		1	1			2		
TUTI*																	
BCCH	1	2	1	1		1	2	2	2		1				3	1	1
BOCH		2	1	2		2	1	1									
GCKI		3	2			3									1		
RCKI	1	2	2	1	1	2	2								2		
BGGN*																	
WOTH	2	2					2				1				1		
VEER	2	2	1				3	2	2		1	1			2		
GCTH*																	
SWTH	2	2	2	2	1	2	2	2		2	1				3	1	
HETH		2	1	1		2	2		2	2	1				3		1
AMRO	2	3	1	2		1	3	3			1	1			3	3	
EABL		2															

Appendix E (continued)

	610	611	613	614	615	616	617	618	619	620	621	622	623	624	625	626
PBGR*														3	3	
COLO			3	1	1		1	2	1			3	1	3	3	
ATPU*																
BLGU*																
RAZO*																
GBBG																
HEGU		1	1													
LAGU*																
RBGU*																
BOGU*																
COTE															1	
ARTE*																
ROTE*																
LETE*																
BLTE*																
LSPE*																
GRCO*																
DCCO															1	
COME			3					3			1	1			3	3
RBME*																
HOME			1	1					1		3				1	
MALL								1			3			1	3	
ABDU			3					3			3	1	3	3	3	3
GADW*																
AMWI*											2				1	
GWTE			1								3				3	
BWTE											3			3	1	
NOSH*														3		
WOOD								1			1		1		1	
RNDU								2					3	3	1	
COGO			3					3	1		3				1	
COEI*																
CAGO			3	3				1			3			1	2	
GLIB*																
AMBI			3					2					1		1	
LEBI*																
GBHE			1					2	1		1	1	1	1	1	
SNEG*																
TRHE*																
LBHE*																
CAEG*																
GRHE													1	1		
BCNH*											2				2	
VARA*								2				1				
SORA*															3	
COMO*																
AMCO*																
AMWO			2				2			2	3	2				
COSN			3				2	2	1	3	2	1	2	1	2	
WILL*																
UPSA*																
SPSA	1		1			1		2			3	3	2	1	1	
KILL								1			3	1	3	1	3	

	610	611	613	614	615	616	617	618	619	620	621	622	623	624	625	626
PIPL*																
SPGR			3													
RUGR			3	1		3	2	2	1		3	3			1	1
RNPH*																
WITU*																
RODO											2		1	3	3	1
MODO											2		1	1	2	1
TUVU*																
NOHA											2		1	3	1	
SSHA			1					3								
COHA*	1															
NOGO																
RTHA			3		1	1			1		1					
RSHA																
BWHA			1	2				1			1		1	1		
BAEA								1								
AMKE			1					2		1	2		1	2	3	
OSPR	1	1	1			1		1	1				1	3	1	
LEOW*																
BAOW												1	1			
NSWO*																
GHOW											2	1	1	1	1	1
YBCU																
BBCU											2	1				
BEKI			2				3	2	1		2			1	1	
HAWO			3		1	1		1	1		2	1	2	2	1	
DOWO				1		1			1		2		1	1	1	
BBWO			3					2	2		3					
TTWO*				1					1							
YBSS			1			1		1	1	1	2	1		1	1	
PIWO			2				2	2	1		2	1	1			
NOFL			3			1	1	2	1		2	1	2	2	3	
WHIP																
CONI			1					2			2		2	1		
CHSW			1					2			3			1		
RTHU			3				1	2	1		2			1	1	
EAKI			2					2		1	1	1	2	1	3	
GCFL								1			2	1	1	1		
EAPH			3								1			2		
OSFL			2		1	1	2	2			1	1				
EWPE			2			1		1	1		1	1	1	1	2	
YBFL							1	2	2		2					
ALFL			2					2			1	1	1	1		
WIFL*											1					
LEFL			2		1	1	2	2			2	1		1	2	
HOLA*													1	1		
BLJA			2	2	1	1	2	2	2		2	1	1	3	1	
GRJA			3	3			2	2	1		2	1	1			
CORA			2		1		2	2	1		3	1	1	3	1	
AMCR	1	1	2			1		2	1		3	1	3	3	3	
EUST								2			3	1	3	3	3	
BOBO			2					2			3	1	2	2	2	
BHCO											3	1	1	1	1	

Appendix E (continued)

	610	611	613	614	615	616	617	618	619	620	621	622	623	624	625	626
RWBB		1	3			1	2	3	1		2	3	3	2	3	
EAME											2					
DROR*																
NOOR											3		1	2	3	
RUBL*			1													
COGR			3			1	2	3	1		3	1	3	1	3	
EVGR			3	2	1	1	1	2	2		3	1	1	1	1	
PIGR*			1				1									
PUFI			2	2	1	1	2	2	1		2	1	3	1	1	
HOFI																
RECR*																
WWCR*																
AMGO			2					2	1		2	1	2	1	2	
PISI			2		1	1		2	1		2					
VESP															1	
SASP											2	1	3	2		
GRSP*																
STSP*																
WTSP			3	1	1	1	2	2	1	1	2	1	2	2	2	
CHSP			3		1	1		2			3	3	2	2	3	
FISP																
DEJU			2	2	1	1	2	2	3		3	1		1	1	
SOSP			3					2	1		3	1		2	3	
LISP			1		1			2			3	1				
SWSP			2					2			1		2			
FOSP*																
RSTO																
NOCA																
RBGR			2		1	1	2	2	1		2	1	2	2	3	
INBU																
SCTA			2				2	2			2					
PUMA*													3	3		
CLSW			3								3	3	1	1		
BASW			3					3	1		3	3	3	3	3	
TRSW			3				2	2			3	1	1	3	3	
BASW								2			3		2	3	3	
NRWS																
CEWA			2			1		2	1		3	1	1	2	3	
REVI			2		1	1	2	2	1		2	1	1	1	1	
PHVI*			1													
WAVI											2		1	1		
YTVI*																
SOVI			2	2	1		2	2	1	1	2	1	1	2		
BAWW						1					1	1		1	1	
BWWA*																
NAWA			2	2		1	2	2	2		2	1	1	1		
TEWA			2	3	1	1	3	3	2	1	2					
NOPA			2	1	1	1	2	2	1		2	1		1	1	
CMWA			2	2	1	1	2	2	2		2					
YEWA								2			2	1	2	2	3	
BTBW			1		1		2	2	1		2	1				
YRWA			1	2	1	1	2	2	3	1	3	1		1		
MAWA			2	2	1	1	2	2		1	2	1				

	610	611	613	614	615	616	617	618	619	620	621	622	623	624	625	626
CSWA			1		1			2	1		2	1	1	1	1	
BBWA			2	3		1	1	1	1				1	1		
BPWA*							1	1								
BLWA				2	1	1	3	2	3	1					1	
BTGW			1			1	2	2	1		2		1		1	
PIWA																
PAWA											2					
PRWA*																
OVEN			2		1	1	2	2	1		2	1	1	2	2	
NOWA			2	1			2	2		3	2	1	1	1	1	
LOWA*																
MOWA					1	1			1			1				
COYE			3		1	1	1	2	3	1	2	1	2	2	3	
WIWA																
CAWA			2		1	1	2	2			2	1	1		1	
AMRE			1			1	2	2			1	1		2	2	
HOSP											3	1	3	3	3	
WAPI*																
NOMO											2		3	3		
GRCA							2	2			3	1	1	1	1	
BRTH																
HOWR			2													
WIWR			2	2	1	1	2	1	1		2	1	1	1		
MAWR																
BRCR			1	1			1	2			3					
WBNU																
RBNU			3	2		1	2	2	1		2					
TUTI*																
BCCH			3				2	2	1		2	1	1	1	3	
BOCH			2	2			2	2	3		2					
GCKI				2			2	2	2		2					
RCKI			2	2	1	1	2	2	2		2	1				
BGGN*																
WOTH					1	1	2	2	1		2	1	1			
VEER			2			1	2	2	1		2	1	1	2	3	
GCTH*																
SWTH			2	2	1	1	2	2	2							
HETH				1			2	2	2		2					
AMRO			3	2	1	1	2	3	2	1	3	3	3	3	3	
EABL																

Appendix E (continued)

	628	629	62A	630	631	632	633	636	637	638	639	641	642	643	644
PHGR*										2		1			
COLO	1	1		1		3		2		3	2				
ATPU*			3												
BLGU*			3												
RAZO*			3												
GBBG			3												
HEGU	1		3	2											
LAGU*	1			1											
RBGU*			3												
BOGU*															
COTE			3							2					
ARTE*			3												
ROTE*			3												
LETE*															
BLTE*															
LSPE*			3												
GRCO*															
DCCO			3												
COME						3	1					3		3	3
RBME*															
HOME		1		1		1		1	1	3					
MALL			3									1			
ABDU						3				1	3	3		3	3
GADW*															
AMWI*															
GWTE															1
BWTE												3			
NOSH*												3			
WOOD		1		1						3					
RNDU		1							3			3			
COGO	3					3	3			3					
COEI*			3									3			
CAGO						3									
GLIB*															
AMBI										3		1			
LEBI*															
GBHE	1	1		1						1		1			
SNEG*															
TRHE*															
LBHE*															
CAEG*															
GRHE													1		
BCNH*		1		1								1	2		2
VARA*															
SORA*															
COMO*												3			
AMCO*												2			
AMWO	1							1			3	2			
COSN	1			2						2		2	1		
WILL*															
UPSA*															
SPSA	2		3	1								3	1		
KILL	2			2				1			3	3	1	1	

	628	629	62A	630	631	632	633	636	637	638	639	641	642	643	644
PIPL*															
SPGR															
RUGR	2														
RNPH*												3		1	1
WITU*														1	
RODO			1												
MODO			3									2	1	1	
TUVU*											1	2	1	1	1
NOHA	1														
SSHA	1											2	1		
COHA*												1			
NOGO															
RTHA	1			1											
RSHA															
BWHA	1					1						1			
BAEA						1						2			
AMKE	2														
OSPR				1						2		3	1		
LEOW*												1	1	1	1
BAOW															
NSWO*												2		1	
GHOW		1									3				
YBCU											1	1			
BBCU			1												
BEKI	1		1		2					1		2			
HAWO	2			1								2			1
DOWO	2	1			1							2			
BBWO				3								2			
TTWO*												3			
YBSS	2	1		1	1	1				1					
PIWO	2				1					2		3	1	1	
NOFL	2	1	1	1		1	3			1		2			
WHIP												2	1		1
CONI	2			1											
CHSW	1			1	1		1					1	1		
RTHU	2		1								1	1			1
EAKI	2	2		2		3						2	1		1
GCFL												3	1		2
EAPH												2	1		
OSFL	2		2	1								3	1		
EWPE	2			1								2	1		
YBFL	2		2									2	1		1
ALFL	2			1								3	1		
WIFL*												3	1		
LEFL	2	1		1		2									
HOLA*												2	1		
BLJA	2	2	3	2	2							1	1		
GRJA	3				1	3						3	1		
CORA	2	1		2	2	1						1			
AMCR	1	1	1									2	1	1	
EUST	1		3									3	1	1	1
BOBO	1		2									3	3	1	1
BHCO	1		3	1								3	3	2	1
												3	1	1	1

Appendix E (continued)

	628	629	62A	630	631	632	633	636	637	638	639	641	642	643	644
RWBB	2	2	2	2		2						3	1	1	2
EAME															
ORUR*															
NOOR												3	1	3	1
RUBL*															
COGR	2	1		2	1	2						3	3	3	3
EVGR	2	1		2	2	1						3	2		
PIGR*						2									
PUFI	2		3	2	2	2						3	1		
HOFI															
RECR*															
WWCR*															
AMGO	2		3	1								2	1	1	
PISI	2			2	1							2			
VESP												3	1		
SASP			3									3	1	1	
GRSP*															
STSP*															
WTSP	2	2	1	2	2							3	1		
CHSP	2	1		1								3	1		2
FISP															
DEJU	3	2	3	2	2	2						3	1		
SOSP	2	1	3	2								3	3	1	1
LISP												1			
SWSP		1								2		3			
FOSP*															
RSTO															
NOCA															
RBGR	2	1		1	2							3	1		
INBU															
SCTA	2			1	2							2	1		
PUMA*												3			
CLSW	2		3									3	1		
BASW	2		3	2		3			3	3		3	1	1	3
TRSW	2		1	2						3		3	3	1	3
BASW				3								1	1		3
NRWS															
CEWA	2		3	1								3	1		
REVI	2	1	3	1	1							3	1		
PHVI*															
WAVI												2			
YTVI*															
SOVI	2	1		1	2							2			1
BAWW	2				2							3	1		
BWWA*															
NAWA	2	1		1	1							3			
TEWA	2	2		1	2							3			
NOPA	2	2	3	1	1	2						3	1		
CMWA	2	1			1	1						3			
YEWA			3									2	1	1	2
BTBW	2			1	2							3			
YRWA	2	1	3	1	2	1						3	1		
MAWA	2	1	3	1	2	1						3	1		

	628	629	62A	630	631	632	633	636	637	638	639	641	642	643	644
CSWA	2		3	1		1						2	1		
BBWA	2	1				1						3			
BPWA*												2			
BLWA	2	2	3	1	2	2						3			
BTGW	2	1	3	1	2							3			
PIWA															
PAWA															
PRWA*															
OVEN	2	1		1	2							3	1		
NOWA	2											2	1	1	
LOWA*															
MOWA	2	1		2	2							2			
COYE	2	2		1								3	1		1
WIWA	1			1											
CAWA	2	2	3	1								3			
AMRE	2	1	3	2	1	1						3	1		2
HOSP	3											3	1	1	1
WAP1*															
NOMO												1	1		
GRCA	2		3									3	1		
BRTH												1			
HOWR															
WIWR	2		3	2	1	2						3			
MAWR															
BRCR	3											1			
WBNU															
RBNU	2		3	1	2							3			
TUTI*															
BCCH	2		3									3		1	1
BOCH	2	2	3		2	2						3			
GCKI	2		2									3			
RCKI	2	2	2	1	2	2						3	1		
BGGN*															
WOTH	2			1								3	1		
VEER	2	1		1		2						3	1		
GCTH*															
SWTH	2	1	3	1	2							3	1		
HETH	2	1	1		2							3			
AMRO	3	2	1	2	1							3	3	1	1
EABL															

Appendix E (continued)

	646	647	648	649	650	651	652	653	655	657	658	659	661
PBGR*									2				
COLO	1		1		1	1	2		3				
ATPU*													
BLGU*													
RAZU*													
GBBG													
HEGU			1						1				
LAGU*													
RBGU*													
BOGU*													
COTE									1				
ARTE*													
ROTE*													
LETE*													
BLTE*													
LSPE*													
GRCO*													
DCCO													
COME			3		1				3				1
RBME*													
HOME	1			1	1				2				
MALL													
ABDU	1								3	1			1
GADW*													
AMWI*													
GWTE									3	1			
BWTE									3	2			
NOSH*													
WODU	1								2				
RNDU	1								3	2			
COGO					3				3	1			
COEI*													
CAGO													
GLIB*													
AMRI	1								2				
LEBI*													
GBHE									3				
SNEG*													
TRHE*													
LBHE*													
CAEG*													
GRHE													
BCNH*													
VARA*													
SORA*													
COMO*													
AMCO*													
AMWO	2				2				2		2		
COSN	2	1							2				
WILL*													
UPSA*													
SPSA	1		3		3				3				
KILL	1								3		1		

	646	647	648	649	650	651	652	653	655	657	658	659	661
PIPL*													
SPGR									1				
RUGR	3				1				3				1
RNPH*													
WITU*													
RODO													
MODO									1		1		
TUVU*													
NOHA									2				
SSHA	1												
COHA*													
NOGO									2				
RTHA	3	1							2				
RSHA											1		
BWHA	1				2				3				
BAEA													
AMKE											1	2	
OSPR	1		2		1				2				
LEOW*													
BAOW									2				
NSWO*													
GHOW									2				
YBCU													
BBCU									1				
BEKI		1	2		2				3				
HAWO	1	1			1				2				
DOWO	2				3				2				
BBWO					3				2				
TTWO*													
YBSS	2	1			3			1	3				
PIWO	2				1				2				
NOFL	1	1	2		3				3				
WHIP													
CONI													
CHSW	1		1		1				3				
RTHU	1				1				2				
EAKI					3				3		1	1	
GCFL	1				2								
EAPH									1				
OSFL	2								1				
EWPE	2				2			1					
YBFL	2				2				2				
ALFL		1			3								
WIFL*													
LEFL	2	1	2		2			1					
HOLA*													
BLJA	2	1	2		3			1	2				
GRJA	1	1			3				2				
CORA	1	1			3				2		1	1	
AMCR	1				3				2				1
EUST									3		3	3	1
BOBO									2		1		
BHCO					1				3		1		

Appendix E (continued)

	646	647	648	649	650	651	652	653	655	657	658	659	661
RWBB	1				3				3		1	1	1
EAME													
OROR*													
NOOR									3		3		
RUBL*													
COGR	1				3				3		3	3	
EVGR	2	1	2		3			1	2		2	2	
PIGR*	2								2				
PUFI	2	1	2		3			1	2				
HOFI													
RECR*													
WWCR*					1								
AMGO	2				2			1	3		1	1	
PISI	1	1			2			1	2				
VESP													
SASP					3						2	1	
GRSP*													
STSP*													
WTSP	2	1	2		3			1	3				
CHSP	2	1	1		3				3		1		
FISP													
DEJU	3	1	2		3			1	3				
SOSP	2				3				3		2	1	
LISP					3								
SWSP					3				2				
FOSP*													
RSTO													
NOCA													
RBGR	2	1			3			1	2		1		
INBU													
SCTA	2	1	2		2			1	3		1		
PUMA*													
CLSW	1								3		2		
BASW	1		2		3	3			3		2	1	
TRSW	2	1	2		3				3		3	2	
BASW	3		3						3				
NRWS													
CEWA	1				1				3		1		
REVI	2	1	2		1			1					
PHVI*									2				
WAVI	2												
YTVI*													
SOVI	2		2		2			1	1				
BAWW	1				2				1				
BWWA*													
NAWA	2	1	2		2			1	2				
TEWA	2	1			3			1	1				
NOPA	2	1	2		3			1	2				
CMWA	2	1	2		3			1	2				
YEWA									3			1	
BTBW	2		2		3				1				
YRWA	2	1			3			1	3				
MAWA	2	1			3			1	3				

	646	647	648	649	650	651	652	653	655	657	658	659	661
CSWA	1				3			1	2				
BBWA	2	1	2		3			1	2				
BPWA*													
BLWA	2	1	2		3			1	2				
BTGW	2	1	2		3			1	2				
PIWA													
PAWA													
PRWA*													
OVEN	2	1	2		3			1	2				
NOWA	2				3				2				
LOWA*													
MOWA	2	1			3			1					
COYE	2	1			3			1	3				
WIWA		1			2				1				
CAWA	2	1	2		2			1	1				
AMRE	2	1			3			1	3		1		
HOSP	1								3		3	1	
WAPI*													
NOMO													
GRCA	2				2				3				
BRTH									1				
HOWR													
WIWR	2	1	2					1	1				
MAWR					3								
BRCR	2								1				
WBNO													
RBNU	2		2		3				2				
TUTI*													
BCCH	2				3			1	2				1
BOCH	2	1			1				1				
GCK1	2				3				2				
RCKI	2	1			2			1	1				
BGGN*													
WOTH	1	1						1	2				
VEER	2				2			1	2				
GCTH*													
SWTH	2	1	2		3			1	2				
HETH	2	1			2			1	2				
AMRO	2	1	3		3			1	3		3	3	1
EABL													

	663	664	665	666	667	670	671	672	673	674	676	677	679
PBGR*							1						
COLU					3	3	3	2	3	2			
ATPU*													
BLGU*													
RAZU*													
GBBG													
HEGU		2	1	2	2		1		1				
LAGU*													
RBGU*													
BOGU*													
COTE							1		1				
ARTE*													
ROTE*													
LETE*													
BLTE*													
LSPE*													
GRCO*													
DCCO					1								
COME					3		3						1
RBME*													
HOME					3		1						
MALL							1						
ABDU							3						
GADW*													
AMWI*													
GWTE							3				3		
BWTE							3						
NOSH*													
WODU							2						
RNDU					3		3						
COGU		1	3		3		3		3				
COEI*													
CAGO													
GLIB*													
AMBI					3		2						
LEBI*													
GBHE							2			1			1
SNEG*													
TRHE*													
LBHE*													
CAEG*													
GRHE													
BCNH*							1						
VARA*													
SORA*													
COMO*													
AMCO*													
AMWO					2		2			2			
COSN							2	3		2			1
WILL*													
UPSA*													
SPSA		1	1	1	3		2		1				
KILL					3		3			3			

	663	664	665	666	667	670	671	672	673	674	676	677	679
PIPL*													
SPGR					3		1						1
RUGR					3		3						1
RNPH*													
WITU*													
RODO							2						
MODO							1						
TUVU*													
NOHA							2						
SSHA													
COHA*													
NOGO							1						
RTHA					1		2						2
RSHA													
BWHA					2		3	1					1
BAEA													
AMKE						1						1	2
OSPR				1	2		2	3	1				2
LEOW*													
BADW							2						
NSWO*													
GHOW			1										
YBCU													
BBCU													
BEKI					3		2		1				
HAWO		1			3		2		1				2
DOWO					3		2						3
BHWO					1		2						3
TTWO*													
YBSS		1			2		2		1				2
PIWO					2		2						2
NOFL					2		3	1	1			1	3
WHIP													
CONI					1		2						
CHSW					1		2						1
RTHU					2		2						1
EAKI					2		3	1	1				1
GCFL													
EAPH							1	1				1	
OSFL					1								3
EWPE					2								2
YBFL					2		1						3
ALFL					2								2
WIFL*													
LEFL		1			2								3
HOLA*													
BLJA			2		3		2	1	1				1
GRJA					1		2		1				3
CORA					3		2		1	1		1	2
AMCR					1		2		1	1			1
EUST					3		3			3			
BOBO					3		2			2			
BHCO					1		2		1				

Appendix E (continued)

	663	664	665	666	667	670	671	672	673	674	676	677	679
RWBB		2	1	1	3		3		1	3			
EAME													
OROR*													
NOOR					1		3						
RUBL*									1				3
COGR				1	3		2	1	1				3
EVGR		1			3		2			1			3
PIGR*					1		2						3
PUFI		1			3		2						3
HOFI													
RECR*													
WWCR*													
AMGO					2		3						2
PISI					1		2						3
VESP													
SASP					3			1				1	
GRSP*													
STSP*													
WTSP	1	1	2		3		2	1	1			1	3
CHSP		1	1		2		2						3
FISP													
DEJU	1	1			3		3	1	1	2		1	3
SOSP					2		2		2	2			2
LISP					3			1	1			1	3
SWSP							2						2
FOSP*													3
RSTO													
NOCA													
RBGR		1			3		2		1				3
INBU													
SCTA					1		2						
PUMA*													
CLSW					3		3						
BASW	1				3		3		3	3			1
TRSW		2	3	1	3		3	1	1	3			3
BASW					3		3		1				
NRWS													
CEWA					3		2			2			3
REVI					2		1		1				3
PHVI*							1						
WAVI					3								
YTVI*													
SOVI		1			3				1				2
BAWW		1			2				1			1	3
BWWA*													
NAWA		1			3			1	1			1	3
TEWA		1			3				1				3
NOPA		1			3				1				3
CMWA					3				1				3
YEWA							2						
BTBW					3								2
YRWA		1	2		3		3					1	3
MAWA		1			2		3		1			1	3

	663	664	665	666	667	670	671	672	673	674	676	677	679
CSWA					1		2						
BBWA					3								3
BPWA*													3
BLWA					3		1		1				3
BTGW		1			2								2
PIWA													
PAWA								1				3	
PRWA*													
OVEN		2		1	2		2		1				2
NOWA					2		2						2
LOWA*													
MOWA					3		1						3
COYE		1			2		2	1				1	3
WIWA		1			1		1						3
CAWA		1			2		1		1				2
AMRE		1			3		2		1				3
HOSP					1		3						
WAPI*													
NOMO													
GRCA					2		3						2
BRTH					2								
HOWR													
WIWR		1			2				1				2
MAWR													
BRCR													
WBNU													
RBNU					3				1				3
TUTI*													
BCCH					3		2	1	1	1		1	1
BOCH		1			2								1
GCKI													2
RCKI		1			3		1		1				2
BGGN*													
WOTH							2		1				
VEER		1			3		2						3
GCTH*													
SWTH		1			2		2		1			1	3
HETH		1			2		2	1	1			1	3
AMRO		1			3		3		1	3		1	3
EABL													

Appendix E (continued)

	681	682	684	685	686	687	688	689	690	695	696	697	698
PBGR*				3			3						
COLO		1		1			3	2		2			
ATPU*													
BLGU*													
RAZO*													
GBBG													
HEGU							1						
LAGU*							1						
RBGU*													
BOGU*													
COTE							3				1		
ARTE*													
ROTE*													
LETE*													
BLTE*													
LSPE*													
GRCO*													
DCCO				1			1				1		
COME				1			2				3		
RBME*							3						
HOME				1									
MALL		1		1									
ABDU				3	3		3		1		1		3
GADW*													
AMWI*													
GWTE				3			1						
BWTE							2						3
NOSH*													1
WODU				3			1						
RNDU				3			3						
COGO	1			3			3					2	1
COEI*													
CAGO													
GLIB*													
AMBI				3		1	3		1				
LEBI*													1
GBHE				1			1		1				
SNEG*													1
TRHE*													
LBHE*													
CAEG*													
GRHE						1	1						
BCNH*											1		
VARA*													1
SORA*													
COMO*				1							1		
AMCO*													
AMWO				3	3				1				
COSN				3		1	1		2				2
WILL*													1
UPSA*													
SPSA				3			2		1				
KILL				3		1	3		1		3		1
PIPL*											3		1
SPGR													
RUGR	2						1						
RNPH*				3	3		2		3				
WITU*													
RODO													
MODO			2								1		
TUVU*							3				1		1
NOHA				1		1			1				
SSHA				3					1				
COHA*													
NOGO									1				
RTHA				1	1				1				
RSHA													
BWHA				3	1		2						
BAEA				1									
AMKE				1			1				1		
OSPR				1			1				1		
LEOW*													
BAOW				3	3		1		1				
NSWO*									1				
GHOW				1									
YBCU													
BBCU						1							
BEKI				3	3		3		1		1	1	1
HAWO				3			2		1			1	
DOWO				3			2		1			1	
BBWO				1			2						
TTWO*													
YBSS				3	3		2		1				1
PIWO													
NOFL				3		1	3		1			1	1
WHIP													
CONI							1		1				
CHSW							1		1				
RTHU				3	2		2		1		1		
EAKI				3	3		3		1		3	1	1
GCFL				3									
EAPH													
OSFL				3	3		2		1				
EWPE				3	3	1	2					2	
YBFL				2	2								
ALFL				2		1	2		1			2	1
WIFL*													
LEFL				3	2	1	3		1			2	
HOLA*													
BLJA				3	3		3		1			1	
GRJA				3									
CORA				3	1		2		1		1	1	
AMCR				1		1	3		1		3	1	1
EUST				3		1	3		1		3	1	1
BOBO				3	2	1	3		1			2	1
BHCO				3	3	1	3		1		3		1

	681	682	684	685	686	687	688	689	690	695	696	697	698
RWBB				3	3	1	3		2	3		3	3
EAME													
OROR*													
NOOR				3	3	1	1			3			1
RUBL*				3	1		1			1			
COGR				3		1	3		1	3		3	1
EVGR				3	1	1	2		1	3		1	1
PIGR*							1						
PUFI				3	2	1	3		1	2		2	
HOFI													
RECR*													
WWCR*							3						
AMGO				3		1	1		1	2			1
PISI				3					1	1			
VESP				3		1	1						
SASP				3	2	1	3		1	1			1
GRSP*													
STSP*													
WTSP				3	3	1	3		1	2		2	1
CHSP				3	3		3		1	3		1	1
FISP													
DEJU				3	2		2		1	2		2	
SOSP				3	2	1	3		1	3		2	1
LISP				3			1		1				1
SWSP				3		1	3		1			1	
FOSP*													
RSTO													
NOCA													
RBGR				3	3	1	2		1	2		2	1
INBU													
SCTA				3	2	1							
PUMA*													
CLSW				3			3			3		3	
BASW				3		1	3		1	3		3	1
TRSW				3		1	3			3		3	1
BASW						1	3		1	3			
NRWS				3									
CEWA				3	1		3		1	1			1
REVI				3	2	1	3			1			1
PHVI*				3	2								
WAVI							1			3			
YTVI*													
SOVI				3	2	1	3		1				
BAWW				3	2		1		1				
BWWA*													
NAWA				3	2	1	2		1				1
TEWA				3	2		2		1			2	
NOPA				3	2		3		1			2	
CMWA				3			3		1				
YEWA						1	3		1	3		3	
BTBW				3	3				1				
YRWA				3	2	1	3		3				
MAWA				3	2		3		1			2	1

	681	682	684	685	686	687	688	689	690	695	696	697	698
CSWA				3	3		2		1				1
BBWA				3			2		1		1	2	
BPWA*							2		1				
BLWA				3	2		1		1				
BTGW				3	2		1		1				
PIWA													
PAWA													
PRWA*													
OVEN				3	3	1	1		1		2	2	
NOWA				3	2	1	2		1			2	1
LOWA*													
MOWA				3	3		3						
COYE				3		1	3		1		2	2	1
WIWA				3					1		2		
CAWA				3	2		3		1			2	
AMRE				3	3	1	3		1			2	1
HOSP				3			3				3	3	1
WAPI*													
NOMO													
GRCA				3	2		2		1		2		
BRTH													
HOWR							2						
WIWR				3		1	2					2	
MAWR													
BRCR				3									
WBNU													
RBNU				3			2		1			2	
TUTI*													
BCCH				3	1		2		1		1		1
BOCH				3	1		2		1			3	
GCKI				3			2		1				
RCKI				3	1	1	2		1				1
BGGN*													
WOTH				3	2		1		1				
VEER				3	2	1	2		1		1	2	1
GCTH*													
SWTH				3	3		2		1		2	2	1
HETH				3	3	1	2		1		2		
AMRO				3	3	1	3		3		3	3	1
EABL													

	699	700
PBGR*		
COLO		
ATPU*		
BLGU*		
RAZO*		
GBBG		
HEGU		
LAGU*		
RBGU*		
BOGU*		
COTE		
ARTE*		
ROTE*		
LETE*		
BLTE*		
LSPE*		
GRCO*		
DCCO		
COME		
RBME*		
HOME		
MALL		
ABDU		1
GADW*		
AMWI*		
GWTE		
BWTE		
NOSH*		
WOOD		
RNDU	3	3
CUGO		
COEI*		
CAGO		
GLIB*		
AMBI		2
LEBI*		
GBHE		
SNEG*		
TRHE*		
LBHE*		
CAEG*		
GRHE		
BCNH*		2
VARA*		
SORA*		
COMO*		
AMCO*		
AMWO		
COSN		1
WILL*		
UPSA*		
SPSA		
KILL		

	699	700
PIPL*		
SPGR		
RUGR		
RNPH*		
WITU*		
RODO		
MODO		
TUVU*		
NOHA		
SSHA		
COHA*		
NOGO		
RTHA		
RSHA		
BWHA		
BAEA		
AMKE		1
OSPR		
LEOW*		
BAOW		
NSWO*		
GHOW		
YBCU		
BHCU		1
BEKI		
HAWO		
DOWO		
BBWO		
TTWO*		
YBSS		1
PIWO		
NOFL		1
WHIP		
CONI		
CHSW		
RTHO		
EAKI		3
GCFL		
EAPH		
OSFL		1
EWPE		
YBFL		
ALFL		1
WIFL*		
LEFL		1
HOLA*		
BLJA		1
GRJA		
CORA		1
AMCR		1
EUST		1
BOBO		1
BHCO		1

	699	700
RWBB	1	
EAME		
OROR*		
NOOR		
RUBL*		
COGR	1	
EVGR		
PIGR*		
PUFI		
HOFI		
RECR*		
WWCR*		
AMGO		
PISI		
VESP	1	
SASP	1	
GRSP*		
STSP*		
WTSP	1	
CHSP	1	
FISP		
DEJU	1	
SOSP	1	
LISP	1	
SWSP		
FOSP*		
RSTO		
NOCA		
RBGR	1	
INBU		
SCTA		
PUMA*		
CLSW		
BASW	1	
TRSW	1	
BASW		
NRWS		
CEWA	1	
REVI		
PHVI*		
WAVI		
YTVI*		
SOVI	1	
BAWW		
BWWA*		
NAWA	1	
TEWA		
NOPA		
CMWA		
YEWA	1	
BTBW		
YRWA	1	
MAWA	1	

	699	700
CSWA		
BBWA	1	
BPWA*		
BLWA		
BTGW		
PIWA		
PAWA		
PRWA*		
OVEN	1	
NOWA	1	
LOWA*		
MOWA		
COYE	1	
WIWA		
CAWA	1	
AMRE	1	
HOSP		
WAPI*		
NOMO		
GRCA		
BRTH	1	
HOWR		
WIWR	1	
MAWR		
BRCR		
WBNU		
RBNU		
TUTI*		
BCCH	1	
BOCH		
GCKI	1	
RCKI	1	
BGGN*		
WOTH	1	
VEER	1	
GCTH*		
SWTH	1	
HETH	1	
AMRO	1	
EABL		

BLOCK	PO	PR	C
000	2	4	22
001	40	12	7
002	43	31	15
003	17	35	40
004	14	27	57
005	56	6	3
006	65	2	1
007	8	38	60
008	16	3	11
009	10	12	82
010	52	1	2
011	43	8	9
012	31	23	42
013	16	24	64
014	21	6	60
015	25	6	41
016	50	4	6
017	29	22	40
018	66		6
019	30	34	43
020	49	13	32
021	21	13	66
022	14	29	54
023	12	5	3
024	28		
025	16	11	6
026	31	2	3
027	23	7	27
028	18	27	46
029	15	20	58
030	3	1	15
031	23	18	31
032	17	20	73
033	22	16	72
034	33	14	17
035	19	9	15
036	8	3	2
037	5		2
038	11	35	64
039	17	29	54
040	17	31	40
041	24	12	102
042	5	48	26
043	14	15	53
044	3	1	7
045		3	60
046	33	9	42
047	26	19	57
048	38	3	33
049	26	4	15
050	16	37	32
051	18	11	9
052	20	38	45

BLOCK	PO	PR	C
053	15	47	35
054	13	26	30
055	22	13	78
056	21	28	70
057	26	14	63
058	61		13
059		4	86
060	13	18	46
061	23	20	55
062	9	12	28
063	2		
064		7	15
065			4
066	23	38	48
067	50	1	1
068	18	40	36
069	21	21	53
070	22	21	16
071	44	14	15
072	11	5	95
073	34	6	20
074	30	19	22
075	5	24	9
076	17	43	40
077	5	31	52
078	10	19	30
079	7	17	28
080	14	13	50
081	2	1	7
082	43	1	2
083			
084	1		
085			
086	4	1	3
087	8	27	57
088			
089	66		
090	68	1	2
091	26	23	41
092	5	42	62
093	38	40	18
094	31	29	42
095	20	30	42
096	17	35	44
097	23	38	34
098	23	16	72
099	41	5	20
09A			
09B	13	12	52
100	39	11	25
101	21	28	48
102			8
103			7

BLOCK	PO	PR	C
104	6	2	79
105	20	2	30
106			
107	15	29	48
108	20	29	13
109	5	1	1
110	45	32	16
111	12	21	4
112	20	8	1
113	30	13	3
114	18	21	72
115	18	44	35
116	33	32	37
117	32	21	62
118	13	41	55
119	54	11	16
120	11	43	31
121	53	2	2
122	3		
123	47		1
124	25	18	35
125	28	7	15
126	23	21	11
127	28		26
128			5
129	18	12	56
130	11	63	36
131	15	44	72
132	22	29	7
133			
134	31	23	30
135	48	22	30
136	35	30	30
137	24	20	33
138	33	16	33
139	59		
140	45	13	10
141	37	33	18
142	34	30	41
143	30	30	49
144	52	16	4
145	36	24	39
146	31	8	47
147	44		6
148	49	13	12
149	54	4	2
150	26	4	25
151	20	22	42
152	34	19	13
153	38	27	29
154			
155	22	31	32
156	6	15	8

Appendix E (continued)

BLOCK	PO	PR	C
157		30	9
158	23	30	59
159	1	2	17
160	17	14	30
161	20	23	64
162			
163	12	28	36
164	24	19	33
165	45	12	13
166	7	13	21
167	24	36	43
168	25	39	30
169	39	24	31
170	15	42	36
171	32	29	36
172	12	52	46
173	47	12	38
174	40	11	12
175			5
176	17	16	12
177	46	8	8
178	19	32	21
179	22	30	34
180	17	35	45
181			2
182	28	43	33
183	23	35	29
184			4
185	3	1	5
186	2		3
187	13	37	33
188	19	35	60
189	21	37	70
190	19	19	88
191	21	20	77
192	14	29	18
193	15	16	2
194	48	3	
195			
196	42		2
197	26	28	26
198	18	50	45
199	12	34	13
200	12	38	37
201	11	30	71
202	39	1	6
203	41	19	7
204	21	15	22
205	51	10	9
206	41	4	5
207	45	20	34
208	17	36	23
209	8	43	55

BLOCK	PO	PR	C
210	12	33	31
211	13	34	51
212			1
213	11	22	47
214		1	2
215	50		3
216	27	23	28
217	1	3	2
218	9	32	52
219	11	36	36
220	12	35	62
221	9	30	76
222	12	30	93
223	23	24	94
224	15	31	81
225	9	47	14
226	23	25	29
227	15	33	49
228	33	26	26
229		16	1
230			
231	17	19	34
232	16	27	35
233	20	53	28
234	21	29	37
235	22	27	31
236	22	4	9
237	18	33	45
238	67	3	4
239	16	37	28
240	25	28	28
241		1	1
242	4	11	8
243	15	45	44
244	13	32	82
245	17	26	61
246	15	46	54
247	16	33	47
248	53	10	9
249	18	37	29
250	9	35	55
251			
252			
253	5	28	53
254	19	43	25
255	7	36	60
256	9	41	54
257	23	37	57
258	11	30	80
259	23	24	85
260	13	24	55
261	26	28	44
262	31	20	34

BLOCK	PO	PR	C
263	15	28	56
264	17	19	2
265	26	9	10
266	10		
267	39	3	31
268	5	1	3
269	22	32	30
270	11	32	52
271	17	31	30
272	44	11	7
273	46	7	6
274	32	33	27
275	20	34	31
276	6	10	8
277	18	36	31
278	33	46	39
279	14	43	59
280	21	39	64
281	14		2
282	56		1
283	47		2
284	11	27	4
285	11	24	2
286			
287	16	43	44
288	28	28	3
289	17	34	46
290	10	30	30
291	18	34	58
292	19	29	82
293	10	37	43
294	15	31	40
295	15	35	50
296	9	8	8
297	25	36	29
298	36	3	
299	37		
300	49		
301	62		
302	17	40	27
303	16	19	28
304	37	20	9
305	6	35	36
306	62		
307	37	2	3
308	33		3
309	13	30	33
310	22	35	28
311	18	38	29
312	13	24	26
313	7	51	35
314	7	7	9
315			1

BLOCK	PO	PR	C
316			1
317			1
318	10	26	1
319			
320	24	41	28
321	2	9	53
322	17	23	31
323	11	43	72
324	23	22	44
325	7	2	6
326		33	9
327			2
328	2	3	2
329	45		
330	28	16	
331	48	20	15
332	8	40	56
333	29	45	33
334			
335	24		1
336	44	1	1
337			
338	47		6
339	25	50	42
340	36		
341	10	13	9
342	40	13	14
343	19	48	8
344	1	8	5
345	18	42	42
346	25	20	12
347	7		2
348	3		
349			
350			
351			1
352			
353			1
354	26	49	11
355	10	23	17
356	19	48	66
357	30	25	36
358			
359			
360			
361	32	21	26
362	42	1	
363			
364	22	30	37
365		1	
366	13	39	52
367	7	25	46
368	36	2	1

BLOCK	PO	PR	C
369	6		4
370	43	15	3
371	39		3
372	27	19	3
373	49	1	3
374	32	29	29
375	26	39	37
376	18		3
377	34	25	44
378	19	41	42
379	8	20	5
380	58		
381			
382	33	21	29
383	12	36	59
384			
385			
386			1
387	21	27	29
388		5	
389			
390			
391			1
392	50	2	4
393	39	4	1
394	28		1
395	30		
396	40	1	9
397	41	31	30
398			
399	22	24	29
400	30	30	34
401	39	8	6
402	17	19	6
403			1
404			
405			
406	33	19	78
407	15	35	2
408	19	33	34
409	25	35	29
410			
411			
412			2
413			1
414			
415	34	15	9
416	44	25	26
417			
418	49		1
419	57	1	5
420			
421	17		

BLOCK	PO	PR	C
422	34	3	9
423	31	37	9
424	39	9	11
425	29	13	14
426			
427			
428	32	1	2
429	52		6
430			
431	30		4
432	6	38	47
433	15	36	38
434	16	5	4
435	81		
436			
437	66		1
438	33		
439			
440			
441	1		1
442	55	4	1
443	29	5	29
444	12		1
445			
446	72	1	
447	10		2
448			4
449			
450	27	41	14
451		1	
452	27	2	2
453			
454	38	27	26
455	59		3
456	39	37	
457	7	38	57
458	35	50	6
459	30	27	6
460	16		
461	34	31	39
462	19	23	54
463			1
464			
465	19	29	27
466			
467			
468	60	1	5
469	39		
470			2
471	23	14	55
472	1	2	1
473	47	15	8
474	25	34	2

BLOCK	PO	PR	C
475	24	27	26
476	34	32	37
477	57	3	6
478	42		
479			1
480	27	14	13
481	23	25	1
482	9		
483	7		
484	3		
485			
486			
487			
488	9		1
489	42	15	11
490	24		
491	54	1	9
492	58	1	10
493	31	1	7
494	34	32	11
495	27	33	47
496	19	38	44
497	11	41	39
498	27	18	30
499	72	5	2
500			
501	14	19	7
502	18	77	9
503	25	21	1
504	4		
505			
506	4		1
507			
508		1	1
509			
510			
511	41	1	
512			
513	55	8	5
514	3	4	5
515	29	25	1
516	32	30	5
517	18	53	11
518	31	17	5
519	10		
520	46		1
521	26	36	27
522	16		1
523	15		
524	13	2	2
525	8	20	6
526	4	49	11
527	11	64	27

BLOCK	PO	PR	C
528	38	15	22
529	38	8	14
530	35	2	6
531	29		
532	23	16	44
533	33	18	38
534	20	11	7
535	5		5
536	23	32	25
537	7	56	27
538	50		
539	26	27	28
540	35	24	29
541	55	4	15
542	19		1
543	6		1
544	70		
545	19	67	3
546	18	46	1
547	17	53	32
548	6	56	25
549			
550	49		13
551	29	25	39
552	47	6	11
553	24	33	42
554	1		
555	39	44	31
556	1		1
557	16	16	8
558	26	20	9
559	18		
560	42	14	11
561	46	20	37
562	22	36	16
563	23	7	12
564	14		5
565	51		
566	1		
567	3		2
568	9	2	1
569	4		1
570	55		11
571	1	3	2
572	3	3	
573			1
574			1
575			
576	23	22	35
577	33	27	13
578	24	36	34
579			
580			

BLOCK	PO	PR	C
581	27	1	1
582	12		
583			
584			
585			
586			
587			
588	62	7	26
589			
590	22	26	
591	19	27	30
592	33	26	
593	22	43	29
594	44	20	1
595	48	27	10
596	18		
597	28	20	4
598	27	44	25
599	29	38	10
600	3	19	2
601	1	15	3
602	62	1	10
603	17		2
604	3		
605	4		7
606	39	16	37
607	20	1	5
608			
609	12		1
610	4		
611	4		
612			
613	22	37	29
614	10	18	4
615	34		
616	45		1
617	10	42	3
618	15	70	9
619	44	12	5
620	11	1	2
621	14	58	35
622	61	1	8
623	43	15	14
624	42	19	20
625	38	11	30
626	4		2
627			
628	17	65	6
629	33	13	
62A	10	6	42
630	44	20	2
631	14	24	
632	13	12	8

BLOCK	PO	PR	C
633	2		2
634			
635			
636	3		
637	1		2
638	5	6	7
639	3		4
640			
641	18	30	69
642	58	2	6
643	23	1	4
644	20	6	6
645			
646	29	51	4
647	43		
648	4	26	4
649	1		
650	14	19	47
651	1		1
652			
653	37		
654			
655	18	46	41
656			
657	3	2	
658	15	6	6
659	9	3	3
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661	8		
662			
663	3		
664	30	4	
665	5	3	2
666	6	1	
667	16	30	48
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669			
670	1		1
671	18	49	26
672	16		2
673	43	1	3
674	5	6	6
675			
676			1
677	17		1
678			
679	14	22	41
680			
681	1	1	
682	1		
683			
684		1	
685	15	2	91

BLOCK	PO	PR	C
686	9	25	24
687	44		
688	26	34	46
689			
690	78	2	3
691			
692			
693			
694			
695			
696	21	11	21
697	12	23	9
698	45	1	3
699	47		2
700	2	2	1
701			
702			
703			

Appendix F. Atlas Data Form

The Maine Breeding Bird Atlas Project; Field data for: 19__ ,19__ , 19__, 19__

NAME:

MAP AREA: _____

ADDRESS:

Species name	AOU #	Po	Pr	Co
Loon, Common	002			
Grebe, Pied-billed	006			
Petrel, Leach's	106			
Cormorant, Dble-crsted.	120			
Heron, Great Blue	194			
Green	201			
Snowy	197			
Black-crowned Night	202			
Bittern, Least	191			
American	190			
Ibis, Glossy	186			
Goose, Canada	172			
Mallard	132			
Duck, Black	133			
Gadwall	135			
Teal, Green-winged	139			
Blue-winged	140			
Wigeon, American	137			
Duck, Wood	144			
Ring-necked	150			
Goldeneye, Common	151			
Eider, Common	160			
Merganser, Hooded	131			
Red-breasted	130			
Common	129			
Goshawk	334			
Hawk, Sharp-shinned	332			
Cooper's	333			
Red-tailed	337			
Red-shouldered	339			

Species name	AOU #	Po	Pr	Co
Hawk, Broad-winged	343			
Marsh	331			
Eagle, Bald	352			
Osprey	364			
Kestrel, American	360			
Grouse, Ruffed	300			
Spruce	298			
Pheasant, Ring-necked	309			
Rail, Virginia	212			
Sora	214			
Gallinule, Common	219			
Coot, American	221			
Plover, Piping	277			
Killdeer	273			
Woodcock, American	228			
Snipe, Common	230			
Sandpiper, Upland	261			
Spotted	263			
Gull, Great Black-bkd.	047			
Herring	051			
Laughing	058			
Tern, Common	070			
Arctic	071			
Roseate	072			
Least	074			
Razorbill	032			
Guillemot, Black	027			
Puffin, Common	013			
Dove, Rock	313.1			
Mourning	316			

Species name	AOU #	Po	Pr	Co
Cuckoo, Black-billed	388			
Yellow-billed	387			
Owl, Great-horned	375			
Barred	368			
Long-eared	366			
Saw-whet	372			
Whip-poor-will	417			
Nighthawk, Common	420			
Swift, Chimney	423			
Hummingbird, Ruby-thr.	428			
Kingfisher, Belted	390			
Flicker, Common	412			
Sapsucker, Yellow-bel.	402			
Woodpecker, Pileated	405			
Hairy	393			
Downy	394			
Black-backed 3-toed	400			
Northern 3-toed	401			
Kingbird, Eastern	444			
Phoebe, Eastern	456			
Flycatcher, Grt Crest.	452			
Alder	466.3			
Yellow-bellied	463			
Least	467			
Pewee, Eastern Wood	461			
Flycatcher, Olive-sid.	459			
Lark, Horned	474			
Swallow, Tree	614			
Bank	616			
Rough-winged	617			

Species name	AOU#	Po	Pr	CO
Swallow, Barn	613			
Cliff	612			
Martin, Purple	611			
Jay, Blue	477			
Grey	484			
Raven, Common	486			
Crow, Common	488			
Chickadee, Boreal	740			
Black-capped	735			
Nuthatch, Red-breast.	728			
White-breasted				
Creeper, Brown	726			
Wren, House	721			
Winter	722			
Long-billed	725			
Short-billed	724			
Mockingbird	703			
Catbird, Grey	704			
Thrasher, Brown	705			
Robin, American	761			
Thrush, Wood	755			
Hermit	759			
Swainson's	758			
Grey-cheeked	757			
Veery	756			
Bluebird, Eastern	766			
Kinglet, Ruby-crownd.	749			
Golden-crowned	748			
Waxwing, Cedar	619			
Shrike, Loggerhead	622			
Starling	493			
Vireo, Solitary	629			
Philadelphia	626			
Yellow-throated	628			
Red-eyed	624			

Species name	AOU #	Po	Pr	Co
Vireo, Warbling	627			
Warbler, Black+White	636			
Tennessee	647			
Nashville	645			
Parula, Northern	648			
Warbler, Yellow	652			
Magnolia	657			
Cape May	650			
Black-throated Bl.	654			
Yellow-rumped	655			
Black-thr. Green	667			
Blackburnian	662			
Chestnut-sided	659			
Bay-breasted	660			
Blackpoll	661			
Pine	671			
Prairie	673			
Palm	672			
Ovenbird	674			
Waterthrush, Northern	675			
Warbler, Mourning	679			
Wilson's	685			
Canada	686			
Yellowthroat, Common	681			
Redstart, American	687			
Sparrow, House	688.2			
Bobolink	494			
Meadowlark, Eastern	501			
Blackbird, Red-winged	498			
Oriole, Northern	507			
Orchard	506			
Blackbird, Rusty	509			
Grackle, Common	511			
Cowbird, Brown-headed	495			
Tanager, Scarlet	508			

Species name	AOU #	Po	Pr	Co
Cardinal	593			
Grosbeak, Rose-breast.	595			
Finch, Purple	517			
House	519			
Bunting, Indigo	598			
Grosbeak, Evening	514			
Pine	515			
Siskin, Pine	533			
Goldfinch, American	529			
Crossbill, Red	521			
White-winged	522			
Towhee, Rufous-sided	587			
Sparrow, Savannah	542			
Vesper	540			
Junco, Dark-eyed	567			
Sparrow, Chipping	560			
Field	563			
White-throated	558			
Lincoln's	583			
Swamp	584			
Song	581			
Sharp-tailed	549			

Return this field card to Reg. Coordinator by end of October.

Enter criteria codes in correct columns:

Po=Possible breeder;checks only

Pr=Probable; single letter codes

Co=Confirmed; double letter codes

Be sure,don't guess!

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Figure 4. Index Map Overlay

Each numbered square denotes the position of one atlas block. Block numbers are read beginning in the upper left corner. So, for example:

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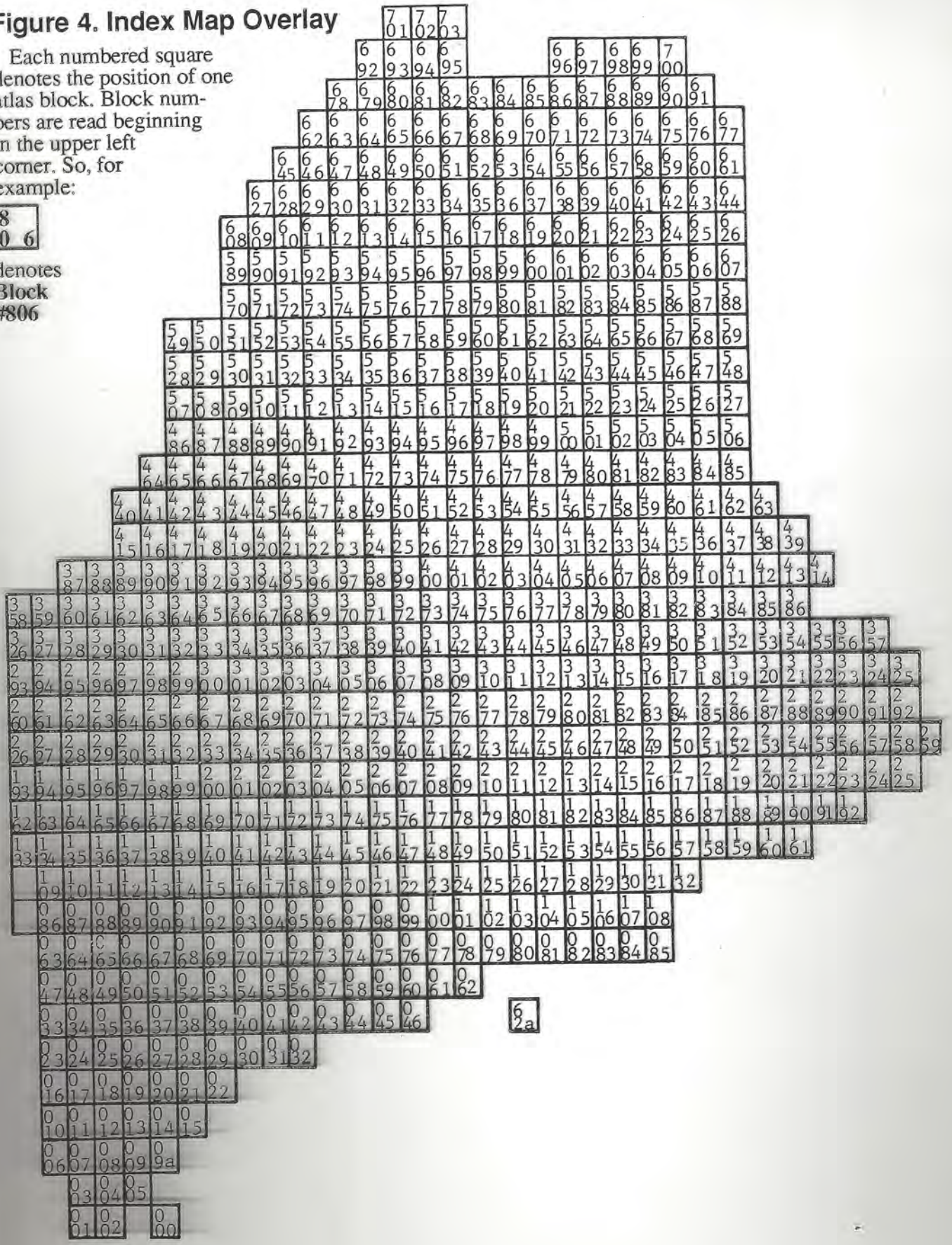
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