

adult birds were noted in the area. Although longspurs did not nest on the pad itself, 3 nests were located on tundra near the pad.

In the undisturbed plot, 6 of the 7 nests were located on low-centered polygons or strangmoor. The remaining nest occurred in an area of frost-boil tundra. No nests were found on non-patterned ground, although phalaropes often were observed around the oxbow pond. Some nests may have been missed in this area. During the course of the summer, dust was often noted on the tundra in both plots; this may have had an effect on bird nesting (Troy 1988).

Table A-11. Number of nests and nest success for bird species on disturbed and undisturbed study plots, Storage Pad, Prudhoe Bay, Alaska, 1990.

Undisturbed Study Plot				
Species	Successful Nests	Failed Nests	Total Nests	Percent Success
Semipalmated Sandpiper	3	0	3	100
Pectoral Sandpiper	1	1	2	50
Stilt Sandpiper	1	0	1	100
Lapland Longspur	0	1	1	0
Total/Mean	5	2	7	71

Disturbed Study Plot				
Species	Successful Nests	Failed Nests	Total Nests	Percent Success
Semipalmated Sandpiper	3	0	3	100
Pectoral Sandpiper	0	1	1	50
Baird's Sandpiper	0	1	1	0
Lapland Longspur	3	0	3	100
Total/Mean	6	2	8	75

Site 12: Prudhoe Bay State 1

Location and Access

Prudhoe Bay State 1 (Fig. A-12) is located in the Prudhoe Bay Unit in Sec. 10, T11N, R14E. It is approximately 0.8 km west of the CGF facility. A peat road, which intersects the gravel road south of CGF, provides access to the pad. The site can be reached in about 10 min on foot.

Description: Disturbed Plot

The well was spudded on April 22, 1967 and plugged and abandoned on April 14, 1985. The well head is no longer evident on the pad.

The gravel pad is irregularly shaped and is roughly 150 m x 100 m. This is not a thick pad; gravel thickness is generally less than 1 m. A circular patch of gravel, which may have been a flare pad, is connected to the north edge of the pad by a gravel berm. Several other patches of gravel and extensive areas of gravel spray are scattered throughout the plot.

In addition to these gravel disturbances, much of the remaining portion of the plot shows signs of other disturbances, such as old vehicle tracks, sparsely vegetated areas, and thermokarsting caused by an old access road on the western portion of the plot. Troughs there and on other portions of the disturbed tundra were often water-filled. A small piece of the peat road is also present at the southern corner of the plot. The gravel and gravel spray cover approximately 33 percent of the study plot. Including all obvious surface disruptions, about 73 percent of this study plot is disturbed.

Little plant colonization has occurred over most of the pad, except on some areas of thin gravel. Areas of gravel spray are usually well vegetated. Wet thermokarst troughs have been colonized by *Eriophorum* spp. and *Arctophila fulva*.

The remaining portion of the disturbed plot is composed of moist and wet graminoid tundra. The landform is non-patterned ground. Portions of two ponds are also present.

Description: Undisturbed Plot

The undisturbed plot is located southwest of the disturbed plot and separated from it by about 100 m. It is composed of moist and wet graminoid tundra. The

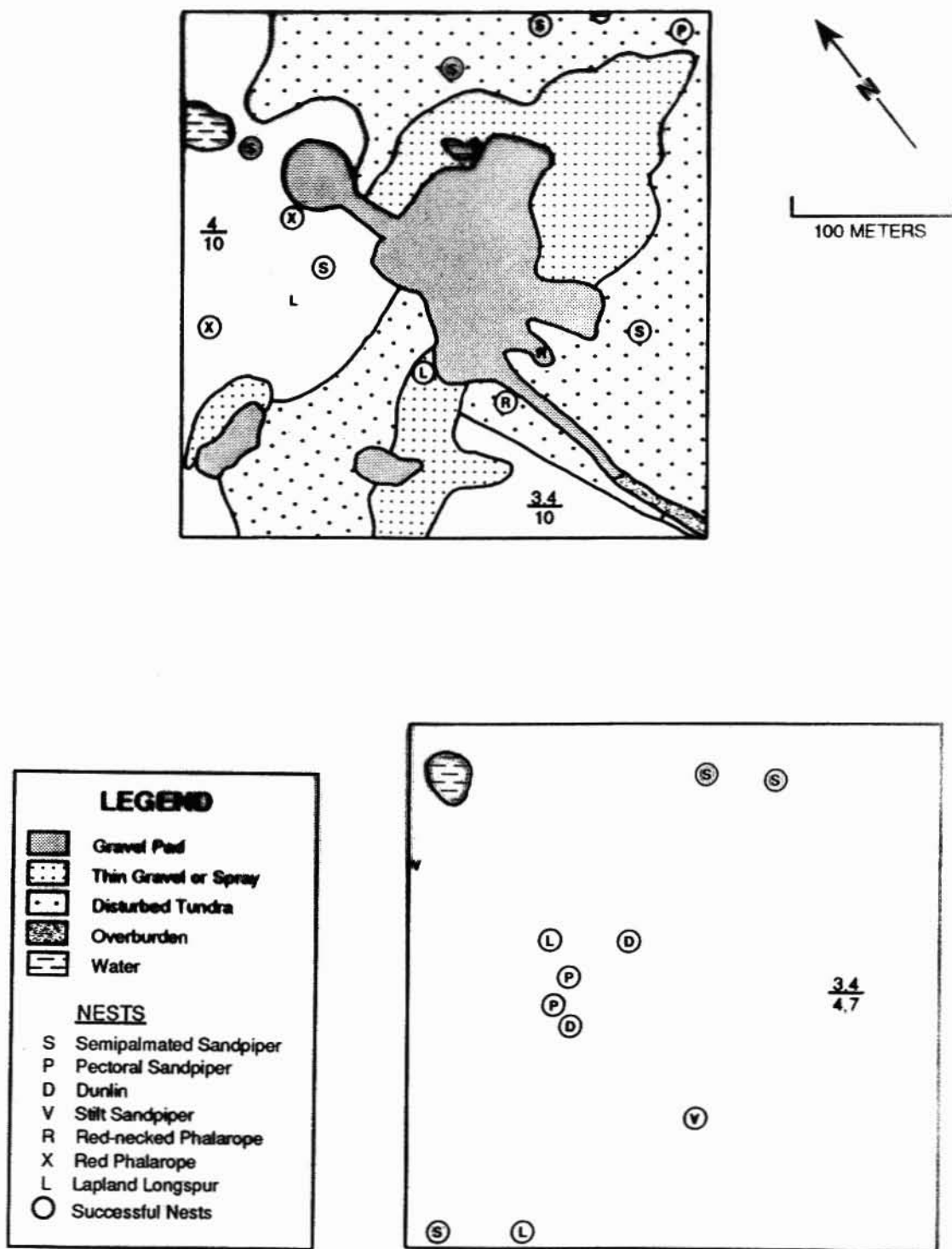
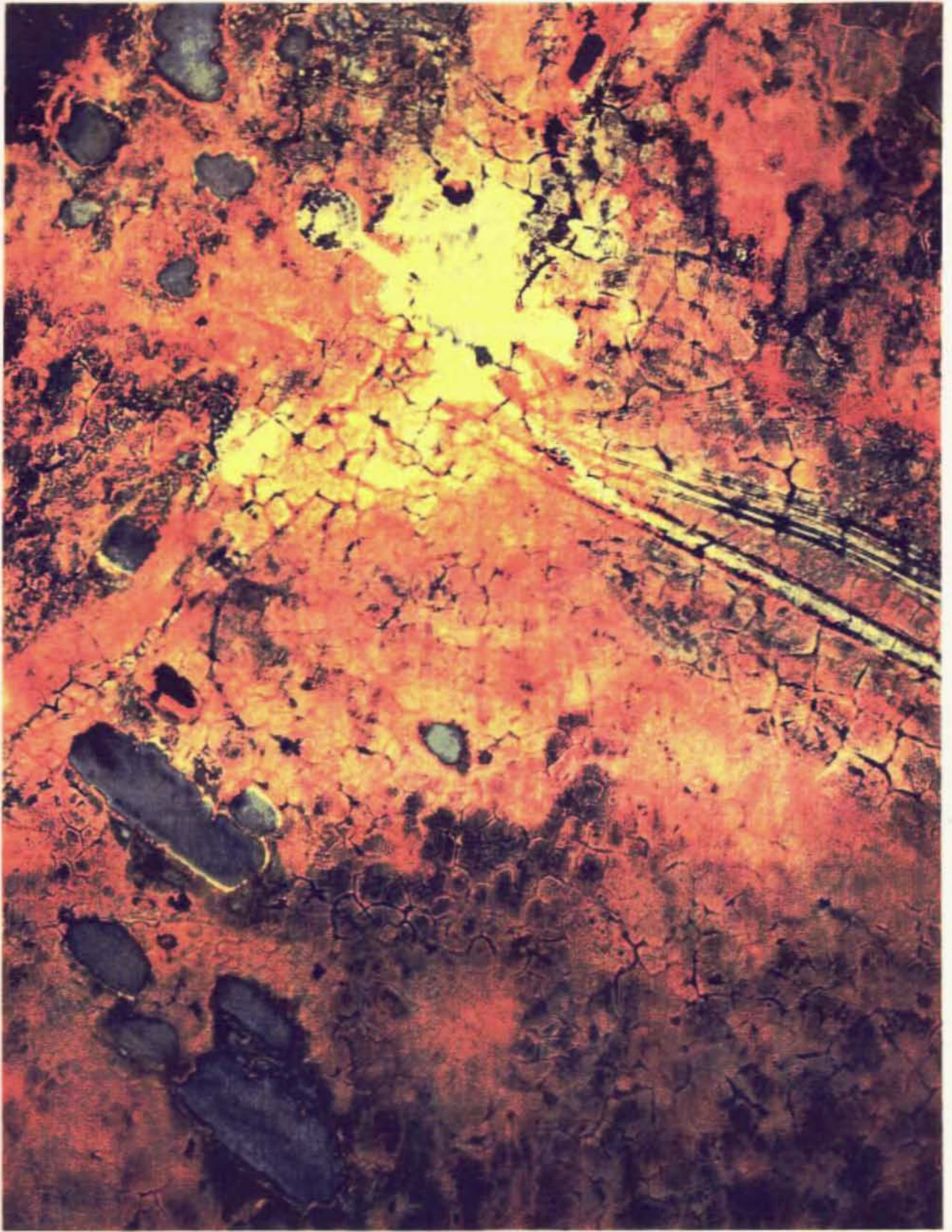


Fig. A-12. Gravel disturbance, nest locations, and geobotanical types of tundra patches or disturbed and undisturbed study plots, Prudhoe Bay State 1, Prudhoe Bay Alaska 1990.



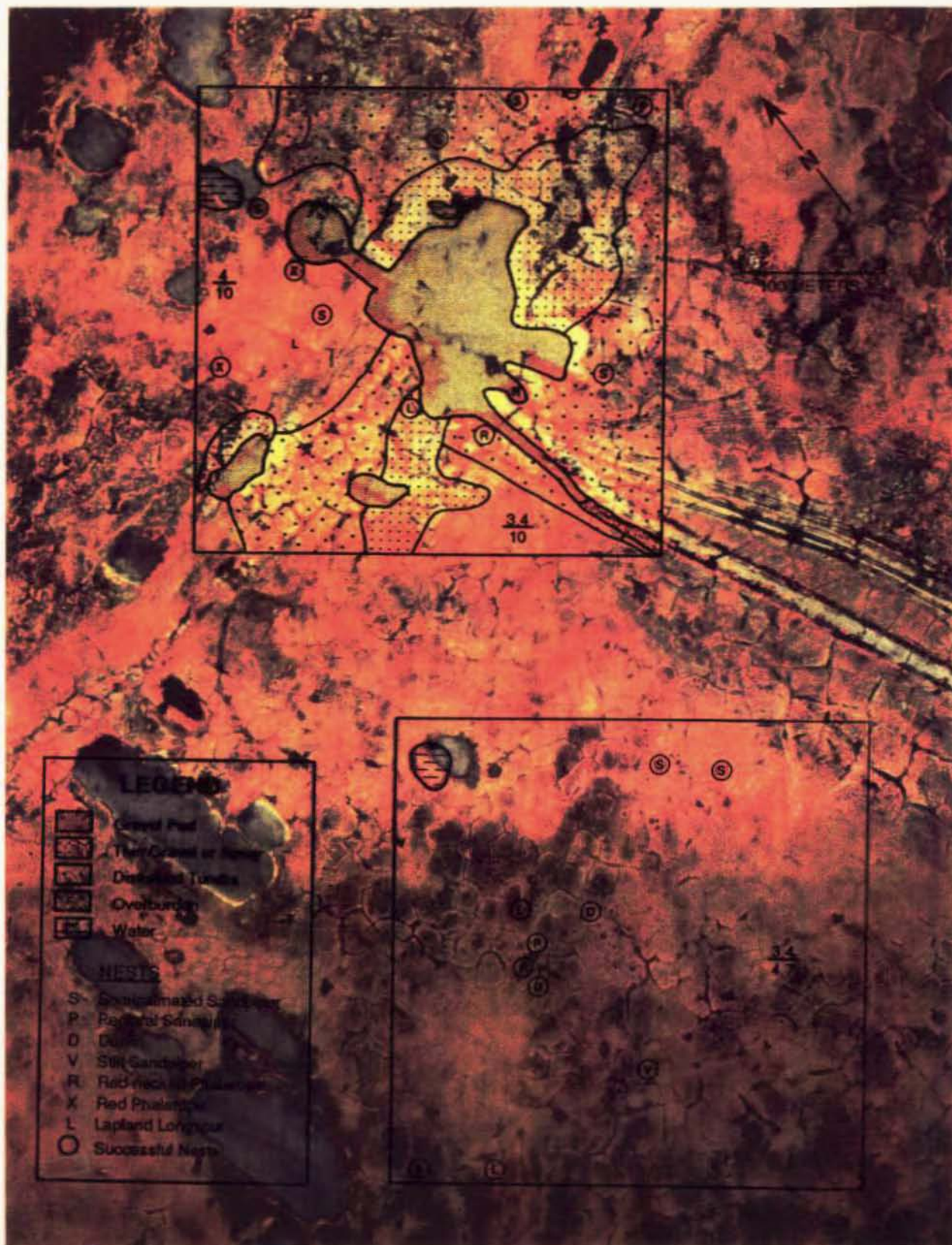


Fig. A-12. Gravel disturbance, nest locations, and geobotanical types of tundra patches on disturbed and undisturbed study plots, Prudhoe Bay State 1, Prudhoe Bay, Alaska, 1990.

landform is a mixture of low-centered polygons and strangmoor. A small pond is present in the northern corner of the plot.

Nesting

Ten of 11 nests were successful in the undisturbed plot, and 10 of 12 nests were successful in the disturbed plot (Table A-12). Each plot had 5 species. All species were shorebirds or longspurs.

In the disturbed plot, 7 of the 12 nests were located in areas which showed some sign of disturbance. One Red-necked Phalarope nested unsuccessfully in a patch of grasses which had colonized the southern portion of the gravel pad. Five successful shorebird nests occurred on tundra which showed signs of heavy disturbance, and a longspur nested successfully in an area of vegetated gravel spray.

In the undisturbed plot, 5 nests were clustered slightly northwest of the plot center. Reasons for this clustering are unclear but may be related to the presence of microhabitat features such as microrelief and water. The remaining nests were scattered throughout the plot.

Table A-12. Number of nests and nest success for bird species on disturbed and undisturbed study plots, Prudhoe Bay State 1, Prudhoe Bay, Alaska, 1990.

Undisturbed Study Plot				
Species	Successful Nests	Failed Nests	Total Nests	Percent Success
Semipalmated Sandpiper	3	0	3	100
Pectoral Sandpiper	2	0	2	100
Dunlin	2	0	2	100
Stilt Sandpiper	1	1	2	0
Lapland Longspur	2	0	2	100
Total/Mean	10	1	11	91

Disturbed Study Plot				
Species	Successful Nests	Failed Nests	Total Nests	Percent Success
Semipalmated Sandpiper	5	0	5	100
Pectoral Sandpiper	1	0	1	100
Red-necked Phalarope	1	1	2	50
Red Phalarope	2	0	2	100
Lapland Longspur	1	1	2	50
Total/Mean	10	2	12	83

Site 13: Lake State 1

Location and Access

Lake State 1 (Fig. A-13) is located in the Prudhoe Bay Unit in Sec. 24, T10N, R15E, approximately 0.3 km east of Drill Site 16. There is no road access to the pad. It can be seen from Drill Site 16 and reached in about 5 min on foot.

Description: Disturbed Area

The well was spudded on March 22, 1969, and was officially plugged and abandoned on January 25, 1981, although activity probably stopped well before that date.

Two gravel pads are present in the study plot. The dimensions of the main pad are approximately 105 m x 55 m. Gravel thickness is about 0.7 m. Areas of thin gravel and gravel spray are present beyond the northern and eastern edges of the pad. A small area of gravel, which may have been a flare pad, is connected to the northeast edge of this pad by a gravel berm. Thermokarsting is not evident. A number of areas of standing water are present in the thin gravel, and water has been impounded on the south side of the berm. The well head is located south of the pad center and consists of a pipe embedded in the gravel.

A smaller gravel pad to the southwest of the main pad is approximately 80 m x 35 m. Thin gravel, possibly the remnants of an old road, is scattered along the tundra west of the pad. The gravel disturbances cover approximately 13 percent of the plot.

This site is the object of an ARCO Alaska, Inc., revegetation study which was initiated in 1986 (Jorgenson 1988). The entire area was fertilized and specific plots were seeded with Tundra Blue Grass (*Poa glauca*) and Arctared Fescue (*Festuca rubra*). The pads are currently about 20 percent vegetated; seeded areas are more heavily vegetated than non-seeded areas. [See Table B-1 (Appendix B) for a list of plant species identified at this site. For a detailed description of the vegetation see Jorgensen (1988).]

The vegetation surrounding the pad is composed of moist and wet graminoids. Landforms are varied with well developed high-centered polygons, low-centered polygons, strangmoor, and a large area of non-patterned ground. Some areas are very wet and ponds are present on the south side of the plot.

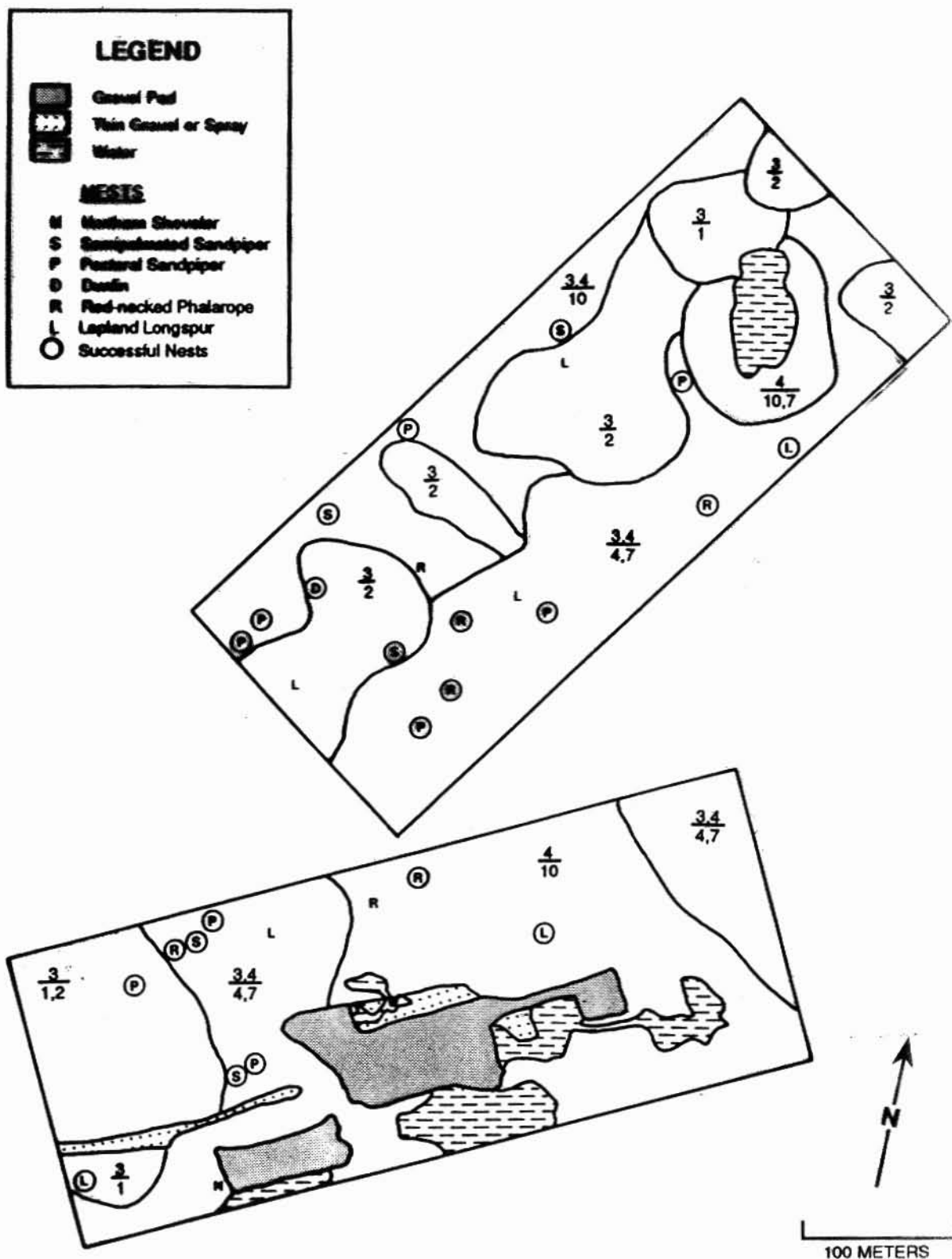


Fig. A-13. Gravel disturbance, nest locations, and geobotanical types of tundra patches on disturbed and undisturbed study plots, Lake State 1, Prudhoe Bay, Alaska, 1990





Fig. A-13. Gravel disturbance, nest locations, and geobotanical types of tundra patches on disturbed and undisturbed study plots, Lake State 1, Prudhoe Bay, Alaska, 1990.

Description: Undisturbed Plot

The undisturbed plot is situated north of the disturbed plot and positioned at an angle to it. The vegetation type is composed of moist and wet graminoids. Landforms are variable with some well defined high-centered polygons, low-relief high-centered polygons that are not well defined, low-centered polygons, strangmoor, and non-patterned ground. A pond in the northeast portion of the plot was fairly well drained and consisted mostly of exposed mud.

Nesting

Eighteen nests were found in the undisturbed plot, and 12 were found in the disturbed plot (Table A-13.). Each plot had 5 species. All species were either shorebirds or longspurs with the exception of a Northern Shoveler which nested unsuccessfully in the disturbed plot near the smaller gravel pad. The proportion of successful was similar in each plot; 14 nests were successful in the undisturbed plot, and 9 were successful in the disturbed plot.

Several Red-necked Phalaropes nested at this site. We found 4 nests in the undisturbed plot and 3 in the disturbed plot. These plots seemed to be wetter than most of the other plots in this study, and that may have accounted for the large number of phalaropes nests.

Pectoral Sandpipers were also common with 6 nests in the undisturbed and 3 in the disturbed plots. Most of these nests were associated with low-centered polygons or small ridges on non-patterned ground. One nest was located on a high-centered polygon in the disturbed plot. All Pectoral Sandpiper nests were successful.

Table A-13. Number of nests and nest success for bird species on disturbed and undisturbed study plots, Lake State 1, Prudhoe Bay, Alaska, 1990.

Undisturbed Study Plot				
Species	Successful Nests	Failed Nests	Total Nests	Percent Success
Semipalmated Sandpiper	3	0	3	100
Pectoral Sandpiper	6	0	6	100
Dunlin	1	0	1	100
Red-necked Phalarope	3	1	4	75
Lapland Longspur	1	3	4	25
Total/Mean	14	4	18	78

Disturbed Study Plot				
Species	Successful Nests	Failed Nests	Total Nests	Percent Success
Northern Shoveler	0	1	1	0
Semipalmated Sandpiper	2	0	2	100
Pectoral Sandpiper	3	0	3	100
Red-necked Phalarope	2	1	3	67
Lapland Longspur	2	1	3	67
Total/Mean	9	3	12	75

Site 14: Delta State 2

Location and Access

Delta State 2 (Fig. A-14) is located just outside the east end of the Prudhoe Bay Unit in Sec. 35, T11N, R16E. It is visible from a point on the Endicott road about 8.0 km east of the Duck Island gravel pit. From that point, the site can be reached in 5 min on foot.

Description: Disturbed Area

There is only one well head on this pad. The well was spudded on March 5, 1975, and suspended on May 17, 1975.

The pad dimensions are approximately 75 m x 175 m. Much of the gravel appears to have been spread onto the adjoining area. The gravel is approximately 0.5 m thick. The reserve pit on the west side has been partially filled with gravel but primarily contains water and mud. Areas of gravel spray are present on both the east and west sides of the pad. No thermokarsting is evident, but shallow furrows caused by heavy equipment are present. The well head is located northwest of the pad's center. The gravel pad, gravel spray, and reserve pit cover approximately 39 percent of the plot.

The pad is sparsely vegetated; total plant cover is less than 1 percent. Most of the vegetation is around the edges of the pad. The gravel spray is characterized by heavily vegetated areas of disturbed tundra.

The vegetation type surrounding the gravel pad is primarily moist and wet graminoid tundra. A small area of prostrate shrub tundra is present on the north side of the plot. The land form is primarily non-patterned ground; some low-centered polygons and reticulate-patterned ground are also present.

Description: Undisturbed Plot

The vegetation of the undisturbed plot is also a combination of moist and wet graminoid tundra, and prostrate shrub tundra. Much of the plot is covered by non-patterned ground with some low-centered polygons in the southwest portion. The landform on a ridge that is centrally located in the plot is reticulate-patterned ground.

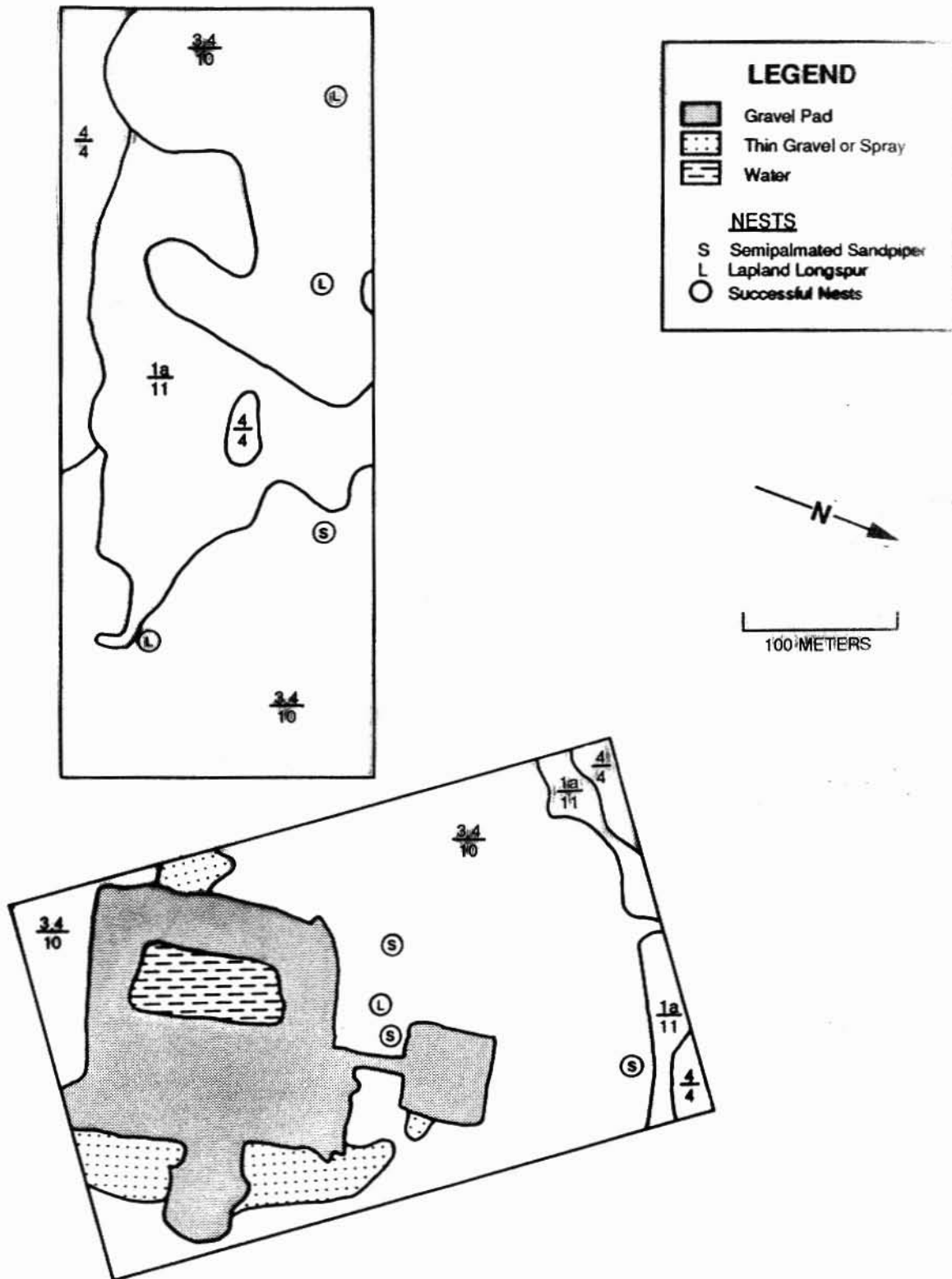


Fig. A-14. Gravel disturbance, nest locations, and geobotanical types of tundra patches in disturbed and undisturbed study plots, Delta State 2, Prudhoe Bay, Alaska, 1991



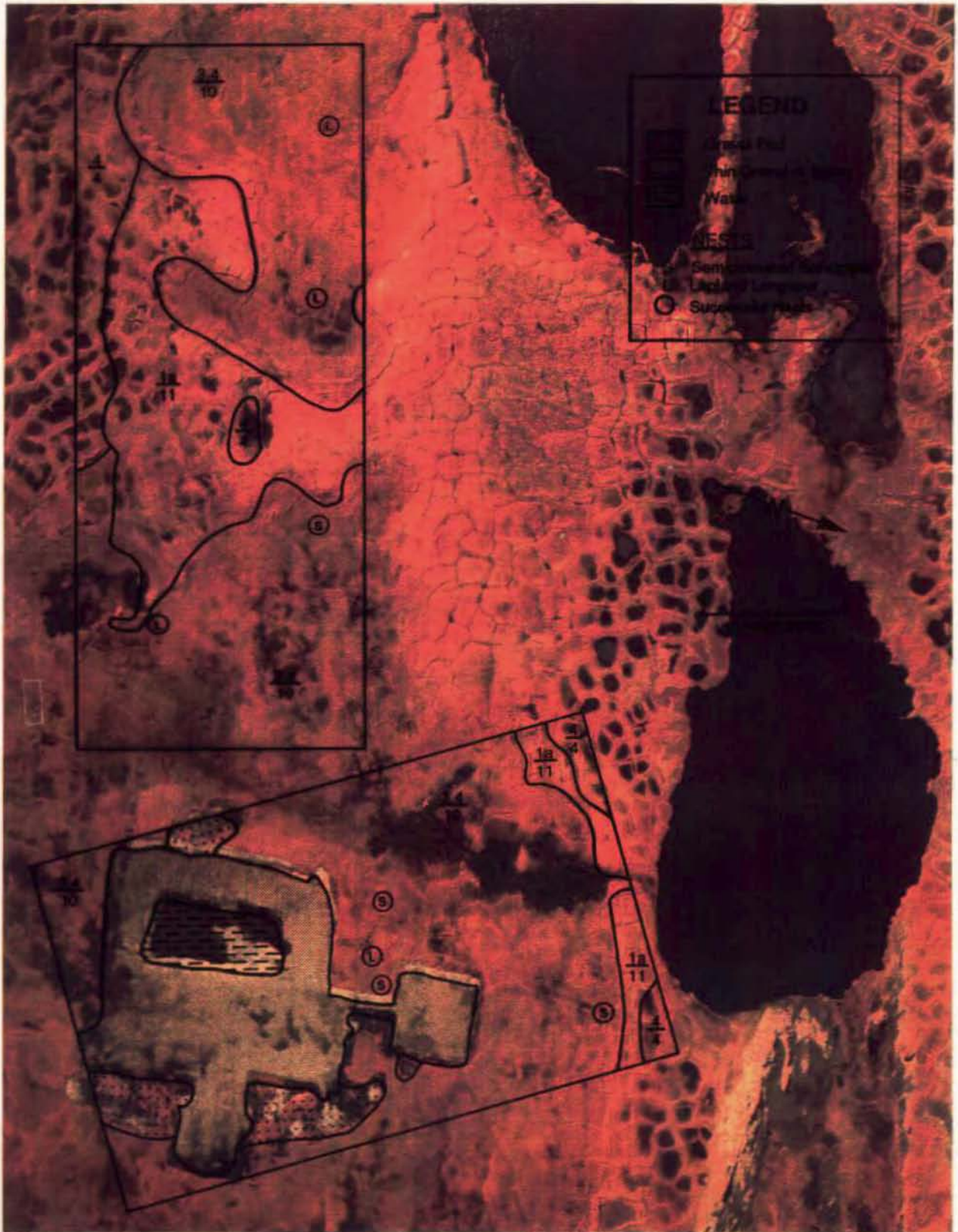


Fig. A-14. Gravel disturbance, nest locations, and geobotanical types of tundra patches on disturbed and undisturbed study plots, Delta State 2, Prudhoe Bay, Alaska, 1990.

Nesting

These plots, with only 4 nests each, had the lowest nest densities of any plots in the study. In the undisturbed plot, 1 Semipalmated Sandpiper and 3 longspurs nested; 3 Semipalmated Sandpipers and 1 longspur nested in the disturbed plot (Table A-14). All nests were successful.

Table A-14. Number of nests and nest success for bird species on disturbed and undisturbed study plots, Delta State 2, Prudhoe Bay, Alaska, 1990.

Undisturbed Study Plot				
Species	Successful Nests	Failed Nests	Total Nests	Percent Success
Semiplamated Sandpiper	1	0	1	100
Lapland Longspur	3	0	3	100
Total/Mean	4	0	4	100

Disturbed Study Plot				
Species	Successful Nests	Failed Nests	Total Nests	Percent Success
Semipalmated Sandpiper	3	0	3	100
Lapland Longspur	1	0	1	100
Total/Mean	4	0	4	100

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