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ASSESSMENT OF THE IMPACTS OF A
TRANS-ALASKA PIPELINE OIL SPILL
ON THE BIRDS AND MAMMALS
OF THE ATIGUN RIVER SYSTEM

by

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An oil spill resulting from a crack in the Trans-Alaska Pipeline was discovered on June 10, 1979 near pipeline mile post 166, on the north side of Atigun Pass. Biologists from various State and Federal resource agencies observed the spill area on several occasions between June 13 and 28. A preliminary environmental assessment was conducted on June 21 (Pamplin 1979). Additional biological assessments of the spill area by Fish and Wildlife Service biologists in late June resulted in a series of reports on the observed and potential impact of the spill on the fish and wildlife (Meehan 1979), birds (Rothe 1979), fish (Metsker 1979), and vegetation (Pichon et al. 1979) of the Atigun River floodplain, and the behavior and fate of the Prudhoe Bay crude oil (Wennekins 1979). The general conclusion of these reports was that the severity of the Atigun spill, and its potential impact on the Atigun River system, warranted follow-up assessment in early August.

This report summarizes observations of birds, mammals and habitat conditions along the Atigun River during August 6 and 7, 1979. Objectives were to (1) document the occurrence of bird and mammal species in the area impacted by the oil spill and (2) their association with several habitat types contaminated to various degrees, (3) document direct impacts of oil on birds and mammals, and (4) speculate on the possible consequences of indirect impacts.

PROCEDURES

Five of the 15 segments (1,5,6,8,15[=Atigun Canyon]) selected by Pamplin (1979) as being representative of different channel and habitat types along the most heavily contaminated area between Atigun Pass and Atigun Canyon were examined on foot. Bird and mammal sightings were recorded by spill segment, activity and habitat type. Notes were made on the presence of oil in the Atigun River system. Observations were made opportunistically and are qualitative in nature. A systematic, quantitative survey was not attempted.

EVIDENCE OF OIL CONTAMINATION

Examination of the substrate of the stream bed in Segment 1 revealed light to medium concentrations of oil trapped within the substrate and interstitial water. Disturbance of the sand/gravel substrate in submerged shallow areas generated a distinct oily sheen downstream. The undersides of rocks and boulders in the stream bed had light coatings of oil. High water conditions during the summer had covered most oil deposits with a several-inch layer of sand and gravel.

We observed no evidence of oil residue on grasses, forbs or willows in any of the five segments examined. No die-off of vegetation due to oil contamination was noted.

Small clumps of oil-soaked detritus was noted in Segments 1, 5 and 6 where it had been deposited as water levels subsided. These deposits were highly weathered and dried-up on the surface.

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BIRD OBSERVATIONS

A total of 24 species was observed (Table 1). Species composition was considerably different from that observed in late June. We recorded 6 species not seen by Rothe (1979), and he noted 10 species not seen by us. Many species of shorebirds had left the area and redpolls, which had been abundant nesters in late June, were seen only once, flying over Atigun Canyon.

Most species, having completed nesting activities, had abandoned territories and were dispersing. Birds were secretive and difficult to observe. Most shorebirds probably had already departed to staging or wintering areas.

Sage (1974) specifically lists 43 species as having been recorded in the Atigun Valley. Observations by Pamplin (1979), Rothe (1979), and Trapp and Spindler (this report) bring this total to 57 species (Table 2). Of these, there is confirmed breeding evidence for 22 species; there is circumstantial evidence of breeding for an additional 11 species.

Waterfowl. -- No waterfowl were observed within the Atigun River floodplain. A few scaup frequented the small pond near Pump Station No. 4.

Shorebirds. -- All shorebird observations were made on sandy gravel secondary channels and adjacent ponds. A flock of 9 American golden plovers was flushed in Segment 8, where they were probably foraging on sandy gravel side channels. Semipalmated plovers had completed nesting activities and most had left the area; they were noted only in Segments 1 and 8. Spotted sandpipers were observed in Segments 1 and 8, including two recently fledged young still having down attached to the contour feathers. A single upland sandpiper was seen in Atigun Canyon.

Jaegers, Gulls and Terns. -- A few long-tailed jaegers were observed in upland tundra adjacent to the floodplain, but none were observed in any of the segments. Glaucous gulls were observed adjacent to the floodplain, particularly in the vicinity of Pump Station No. 4, but were not observed on any of the segments. Mew gulls were also common near Pump Station No. 4, and occasionally were observed flying over upland tundra adjacent to the floodplain. Three arctic terns foraged in the main river channel at Segment 8.

Raptors, Ravens and Shrikes. -- Single individuals of rough-legged hawks and short-eared owls were observed on upland tundra just south of the Atigun River. No golden eagles were observed during our survey, but Peter Spatt (pers. comm.) reported a nest with a young bird in the Atigun Canyon earlier in the summer. Common ravens were regular in upland tundra adjacent to the floodplain especially near Pump Station No. 4; no foraging was observed on the floodplain. Northern shrikes were observed in riparian willows of Segments 1 and 12.

Passerines. -- The most abundant species was the water pipit, which was observed in Segments 1, 5 and 6. They were most frequently observed in the riparian willows and gravel/sand side channels, where they foraged. Many fledglings were observed. Tree sparrows, white-crowned sparrows,

and savannah sparrows all frequented the riparian willows. In general, these species were found only in the oldest, densest stands of willow. Smith's and Lapland longspurs were seen in low willow-sedge tundra adjacent to the river terrace.

Evidence of Direct Impact of Oil Spill on Birds

An oil spill may directly impact on bird populations in several ways: (a) soiling of feathers by direct contact with oil resulting in stress and possible death from hypothermia; (2) transfer of oil from body feathers of soiled bird to eggs, resulting in possible reduced hatchability of eggs; (3) ingestion of toxic petroleum elements while feeding or preening.

No oiled birds were observed and no carcasses of oiled birds were found, suggesting that the spill had minimal direct impact on the area's avifauna. Oiled birds and nests had been observed in late June (Meehan 1979, Pamplin 1979, Rothe 1979).

Indirect Impact of Oil Spill on Birds

An oil spill may indirectly impact on bird populations by (1) eliminating or greatly reducing the abundance of prey species upon which a species is dependent or (2) killing plants and vegetation upon which birds are dependent for food, protective cover, or nesting.

Pamplin (1979) suggested that invertebrate populations in the affected Atigun River channels were low compared to those in unaffected tributaries. Subsequent surveys by Peter Spatt (pers. comm.) indicate lower total densities, but similar species composition, in affected areas relative to unaffected areas. The effect of this apparent lowered density of aquatic invertebrates upon shorebirds and waterfowl is unknown.

Voles and ground squirrels are extremely important in the diet of several raptorial birds of the Atigun River system. The abundance of small mammals during the August 6-7 survey suggests that they were minimally affected by the oil spill.

We observed no evidence of vegetation die-off due to oil contamination.

MAMMAL OBSERVATIONS

Mammal Sightings

The presence of 7 mammal species was noted within the Atigun River floodplain.

Brown (Grizzly) Bear (Ursus arctos). -- Recent tracks and scats (no more than 1-2 days old) were observed in Segments 1 and 6.

Wolf (Canis lupus). -- Wolf tracks were observed on a sand bar along the tributary entering from the east in Segment 8.

Red Fox (Vulpes Vulpes). -- Red fox tracks were observed on sand bars at Segments 5, 6 and 8.

Arctic Ground Squirrel (Spermophilus parryi). -- Ground squirrels were observed to be common in Segments 1 and 8, and present in the more upland portions of Segments 5 and 6.

Singing Vole (Microtus miurus). -- Singing voles were abundant at Segment 1, where we observed numerous caches of winter forage (mostly Salix alaxensis and Epilobium latifolium leaves) which resembled haystacks among the willow shrubs. We watched four different voles harvesting leaves and caching them within a 10 x 5 m area of vegetated gravel bar. A singing vole was observed swimming across a tundra pond at the entrance to Atigun Canyon.

Moose (Alces alces) -- A cow moose was observed browsing in low willows at Segment 1. Recent tracks were seen in all segments.

Caribou (Rangifer tarandus). -- Recent tracks were noted on the sand bars in Segment 8.

Direct and Indirect Impact of Oil Spill on Mammals

We did not observe direct mortality to any of these species resulting from the oil spill. Indirect effects, if any, were probably greatest upon the small mammal populations inhabiting vegetated habitats inundated with oily water. Microtus and Spermophilus both rely on fresh vegetation and seeds for summer sustenance; individuals of these species whose home ranges were largely contaminated by oil may have suffered from ingestion of oil-soaked forage. This, however, appeared to be a short-lived problem since much of the oil-soaked vegetation had recovered and was sprouting new green growth. The large mammal species were probably not affected since contaminated areas most likely comprised only a small portion of their total home range and hence could have been easily avoided.

ATIGUN CANYON

Oil-contaminated waters passing through the Atigun Canyon area in the proposed extension to the Arctic National Wildlife Range (ANWR) apparently did not cause major direct or indirect mortality to birds or small mammals. On August 6, Spindler hiked downstream 4 miles from Atigun bridge #2 to inspect wildlife habitats. There was no evidence of oil along the river shoreline about 2 miles downstream from bridge #2. Bird and small mammal use of the river shoreline in the canyon appears to be limited by the restricted shoreline area. Bird activity was somewhat greater on the south-facing tundra slope at the entrance to the canyon: 2 yellow wagtails, 1 upland sandpiper, 1 northern shrike, 1 common raven. In addition, Peter Spatt (pers. comm.) reported a golden eagle eyrie with one eaglet near the large waterfall, on the south side of the canyon.

A factor of consideration for future management of the proposed ANWR extension is the amount of garbage that has washed down the river and been deposited along the banks of the river within the addition. Spindler observed numerous pieces of styrofoam, plastic sheeting, survey stakes and ribbons, and food wrappers about 2 miles downstream from Bridge #2. A great amount of garbage left from pipeline construction is dispersed throughout the corridor; much of it has blown away from the haul road and pipeline pad and lodged in riparian willows on the Atigun floodplain. High waters then carry these items downstream and deposit them within the proposed refuge. Unless the trash is cleared up by work crews combing the pipeline corridor, it will remain a continued source of pollution for both the Arctic National Wildlife Range and the Gates of the Arctic National Monument.

CONCLUSION

It is unlikely that the Atigun River oil spill of June 10, 1979 will have significant, long-term, adverse impacts on the birds and mammals of the Atigun River system.

RECOMMENDATIONS

1. Small amounts of Prudhoe Bay crude oil still remain within the fluvial substrate of the Atigun River. This oil will continue to be slowly leached from the substrate and released into the waters of the Atigun River. The fate of this oil should be monitored in the spring of 1980, following "break-up," by a 1- or 2-man party.
2. Potential long-term, detrimental impacts of the Atigun River oil spill will probably be best documented by a detailed study of the invertebrate fauna. We suggest that a systematic, quantitative survey of the benthic and free-floating macro-invertebrates be funded in 1980 to compare population densities and species composition in affected and unaffected portions of the Atigun River system.
3. Additional assessments of the effects of the Atigun River oil spill on the birds and mammals of the Atigun River system is unwarranted at this time.

LITERATURE CITED

- Meehan, R. 1979. Fish and wildlife survey of the Atigun River after the June 10, 1979 Alyeska Pipeline crude oil spill. Unpubl. Admin. Report, U.S. Fish and Wildlife Service, Northern Alaska Ecological Services, Fairbanks, Alaska. 13 pp.
- Metsker, H. 1979. Fish impacts in the Atigun River Prudhoe crude oil. Unpubl. Admin. Report, U.S. Fish and Wildlife Service, Environmental Contaminant Evaluation, Anchorage, Alaska. 6 pp.
- Pamplin, L. 1979. Environmental assessment of the TAPS' crude oil spill into the Atigun River system. Memorandum to Ray Morris, Environmental Protection Agency, dated June 28, U.S. Fish and Wildlife Service files, Anchorage, Alaska. 6 pp.
- Pichon, W.M., T. Rothe, and L. Ward. 1979. Observations of the vegetation of the Atigun River floodplain as affected by a crude oil spill from the Trans-Alaska Pipeline. Unpubl. Admin. Report, U.S. Fish and Wildlife Service, Anchorage, Alaska. 6 pp.
- Rothe, T.C. 1979. Birds associated with the Atigun River crude oil spill (TAPS). Unpubl. Admin. Report. U.S. Fish and Wildlife Service, Office of Special Studies, Anchorage, Alaska. 6 pp.
- Sage, B.L. 1974. Ecological distribution of birds in the Atigun and Sagavanirktok river valleys, arctic Alaska. Canadian Field-Nat. 88: 281-291.
- Wennekens, M.P. 1979. Behavior and fate of spilled Prudhoe crude upon the Atigun River flood plain. Unpubl. Admin. Report, U.S. Fish and Wildlife Service, Anchorage, Alaska. 3 pp.

Table 1. Bird observed within the Atigun River floodplain, August 6-7, 1979.

<u>Species</u>	<u>No. of Individuals</u>	<u>Spill Sections</u>	<u>Habitats</u>
Scaup	few	-	pond
Rough-legged Hawk	1	-	upland tundra
American Golden Plover	9	8	gravel/sand side channels
Semipalmated Plover	3	1,3	gravel/sand side channels
Upland Sandpiper	1	15	
Spotted Sandpiper	7	1,3	gravel/sand side channels, adjacent ponds
Northern Phalarope	1	-	pond
Long-tailed Jaeger	few	-	upland tundra
Glaucous Gull	several	-	upland tundra
Mew Gull	2	1,3	upland tundra
Arctic Tern	3	8	main channel
Short-eared Owl	1	-	upland tundra
Bank Swallow	1	8	
Common Raven	3	6,15	upland tundra
Wheatear	5	-	upland tundra
Water Pipit	29	1,5,6	riparian willow, gravel/sand side channels, upland tundra
Yellow Wagtail	2	15	gravel/sand side channels
Northern Shrike	3	1,15	riparian willows
Redpoll	1	15	riparian willows
Savannah Sparrow	8	5,6	riparian willows
Tree Sparrow	8	1,6,8.	riparian willows
White-crowned Sparrow	5	5	riparian willows
Lapland Longspur	5	1,6,8	riparian willows
Smith's Lonsupur			
Snow Bunting	20	-	upland tundra

Table 2. Birds of the Atigun River system.¹

Species	Authority			Trapp and Spindler (this report)
	Sage (1974)	Famplin (1979)	Roche (1979)	
Common Loon		X		
Arctic Loon	X			
Whistling Swan	X			
Canada Goose	X			
Mallard	b			
Green-winged Teal	B	X	X	
American Wigeon	b			
Greater Scaup	B			X
Oldsquaw	B		X	
Harlequin Duck	b			
Red-breasted Merganser	B			
Rough-legged Hawk			X	X
Golden Eagle	B	X	X	
Bald Eagle	X			
Gyr Falcon	B			
Willow Ptarmigan	B	X		
Rock Ptarmigan	b			
American Golden Plover	B	X	X	X
Semipalmated Plover	b	X	B	X
Bar-tailed Godwit	X			
Upland Sandpiper		X		
Buff-breasted Sandpiper		X		
Solitary Sandpiper		X		
Spotted Sandpiper	b	X		B
Wandering Tattler	X		X	
Yellowlegs		X		
Baird's Sandpiper			X	
Least Sandpiper			X	
Western Sandpiper	X			
Northern Phalarope	b		B	X
Common Snipe	b			
Parasitic Jaeger	X			
Long-tailed Jaeger	b	X	X	X
Glaucous Gull	X		X	X
Mew Gull	B	X	X	X
Arctic Tern		X	X	X
Short-eared Owl			X	X
Yellow-shafted Flicker	X			
Say's Phoebe	B			
Horned Lark	b			
Cliff Swallow	B			
Bank Swallow				X
Common Raven	X	X	X	X
American Robin	B	X	X	
Wheatear	b			X
Water Pipit	b		X	b
Yellow Wagtail			b	X
Northern Shrike	B			X
Gray-crowned Rosy Finch			X	
Redpoll	B	X	B	X
Savannah Sparrow	B	X		b
Tree Sparrow	B	X		X
White-crowned Sparrow	B	X	b	b
Golden-crowned Sparrow		X		
Lapland Longspur	B	X	b	b
Smith's Longspur	B			b
Snow Bunting	b	X		X

¹B = breeding confirmed; b = circumstantial evidence of breeding; x = species recorded, but no evidence of breeding.

