8-5-2004

Ex. 277-US-422

R. Nawa
Oregon Department of Fish and Wildlife

C. Huntington
Oregon Department of Fish and Wildlife

Stream: Williamson River
Tributary to: Upper Klamath Lake
Survey Type: ODFW Stream Habitat
Access: Canoe
Reach: 2 (Units 9-26)
Start: T35S-R07-S21NE
Quad: Agency Lake, Chiloquin
Dates Surveyed: 4-5 August 04
Surveyors: R. Nawa, K. Hartzell
Report: R. Nawa, C. Huntington
Disatance Surveyed: 6.5 km

Reach Description
Highway 97 bridge to Sprague River.

Land Use
Primary land use is rural residential and cattle pasture.

Valley and stream channel geometry
The 0.05 percent gradient river was in a valley over 1km wide. Sinuosity was low (1.2). Low terraces sloped abruptly to form narrow floodplains adjacent to the 53 m wide river.

Substrate
The streambed was very fine textured. An estimated 45 percent of the streambed was in sand and organics, gravel 8 percent, cobble 23 percent, and bedrock 9 percent. Exposed bedrock suggests that alluvium forms a relatively thin layer of substrate that is vulnerable to being lost with scour. Scoured riffles were most apparent below the county boat launch.

Spawning Gravel
Spawning gravel was concentrated in riffles. Large patches of suitable spawning gravel were found adjacent to mid-channel bars (islands). Accumulations of gravel/cobble >1000 m^2 suitable for Chinook salmon spawning were mapped (see Map). Surveyors visually estimated 4,000 m^2 of gravel/cobble at a riffle above the Highway 97 bridge (U9). Similarly, 3,900 m^2 of gravel/cobble was at U13, 2,100 m^2 at U15, U17, U18 and 1,260 m^2 at U22. Surveyors estimated a total of 12,837 m^2 of gravel/cobble were suitable for spawning at existing low flows (1,982m^2 /km). An additional 656 m^2 would be available at high flows.

Riffles were 40 percent cobble, 17 percent gravel and 20 percent bedrock. Riffles are depositional areas and would be expected to be 100 percent alluviated. However, about 18,000 m^2 of riffle habitat is bedrock. Significant areas of exposed bedrock in riffles suggests that suitable spawning habitat has been lost due to scour to bedrock. For example, a riffle at Unit 20 is 20 percent bedrock. Unit 24 also appears to be losing alluvium while bedrock increases. High percents of cobble suggest that finer textured gravel is being removed leaving only coarse cobbles. Unusually deep pools in an alluviated system is also evidence that the river is scouring. Percent composition of sand, gravel, cobble, boulder and bedrock in riffles needs to be monitored quantitatively over time to establish trends for this

reach. An alternative hypothesis is that bedrock is decreasing, since pre-2004 substrate data is not available.

Riparian Vegetation

Patches of willows and alders border the river, but grass dominates the riparian zone. Apparently existing grass and willow cover is adequate to stabilize streambanks because only 2 percent of streambanks were eroding. Shade, which averaged 15 percent, is not a major factor for maintaining cool stream temperatures.

Wood

Wood debris (4 pieces/100m) was mostly sunken logs. These log were presumably a product from temporary log storage for former saw mills. Very few (if any) trees from the riparian zone are falling into the channel. Scattered saw logs in the bottom of pools is not affecting channel morphology (i.e. wood is not storing sediment or causing local scour). A log jam found at the head of an island 300 m below the county boat launch appears to have been influential in the deposition of alluvium over bedrock. Units 20 and 21 adjacent to the island provide suitable spawning gravel. A log jam of 60+ pieces at unit 23 was a factor in the formation of a gravel bar.

Rearing and Adult holding Habitat

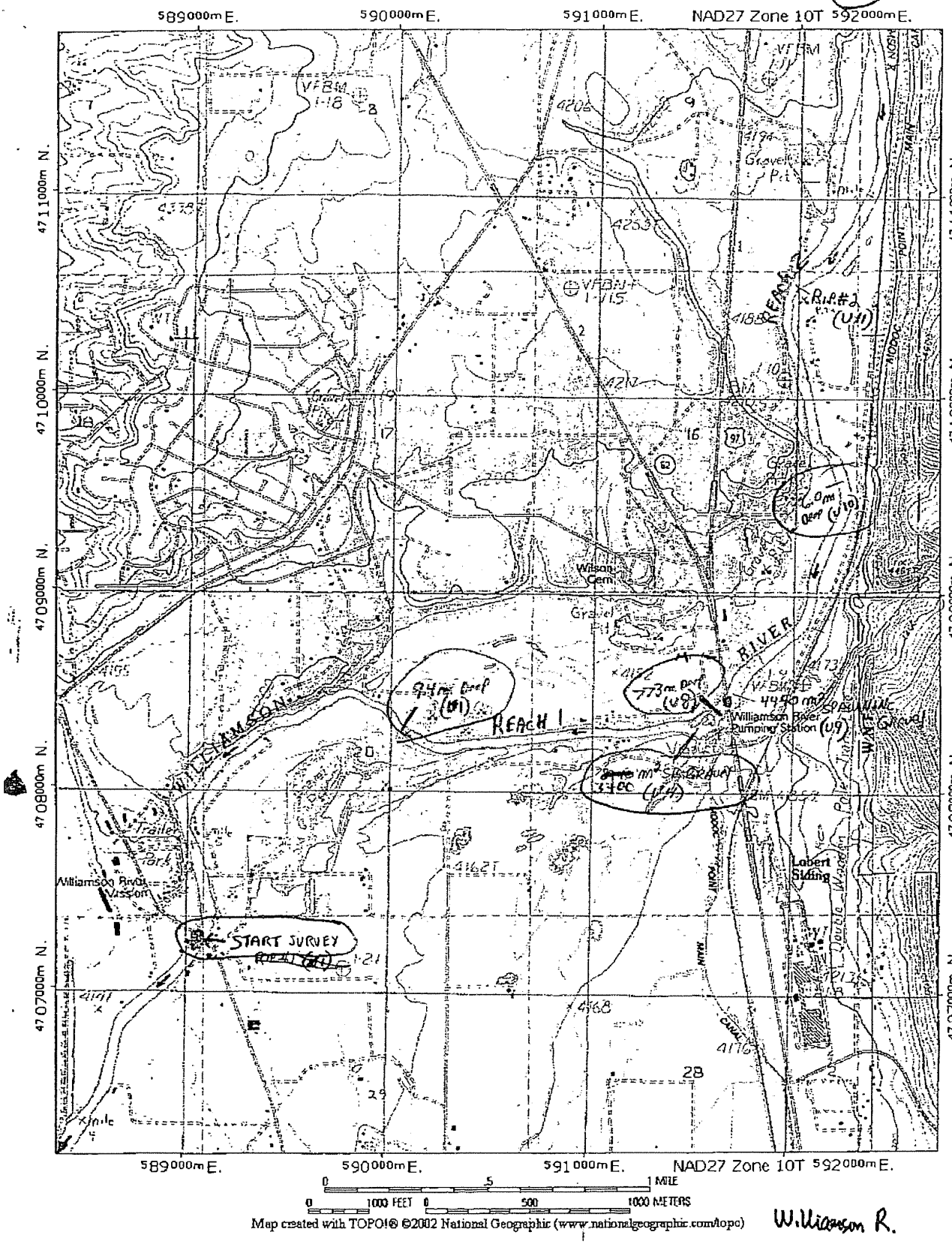
Due to very low stream gradient, much of the reach consisted of 5 long scour pools or glides (275m-2,154 m) separated by shorter low gradient riffles (86m-233 m). Maximum pool depths measured with a depth finder were incredibly deep and have the potential to hold large numbers of Chinook salmon adjacent to large patches suitable spawning gravel. The location of maximum depths ranging from 5.4m to 8.3 m were mapped for 3 pools. (U10,U14,U21). Residual depths averaged (4.2 m).

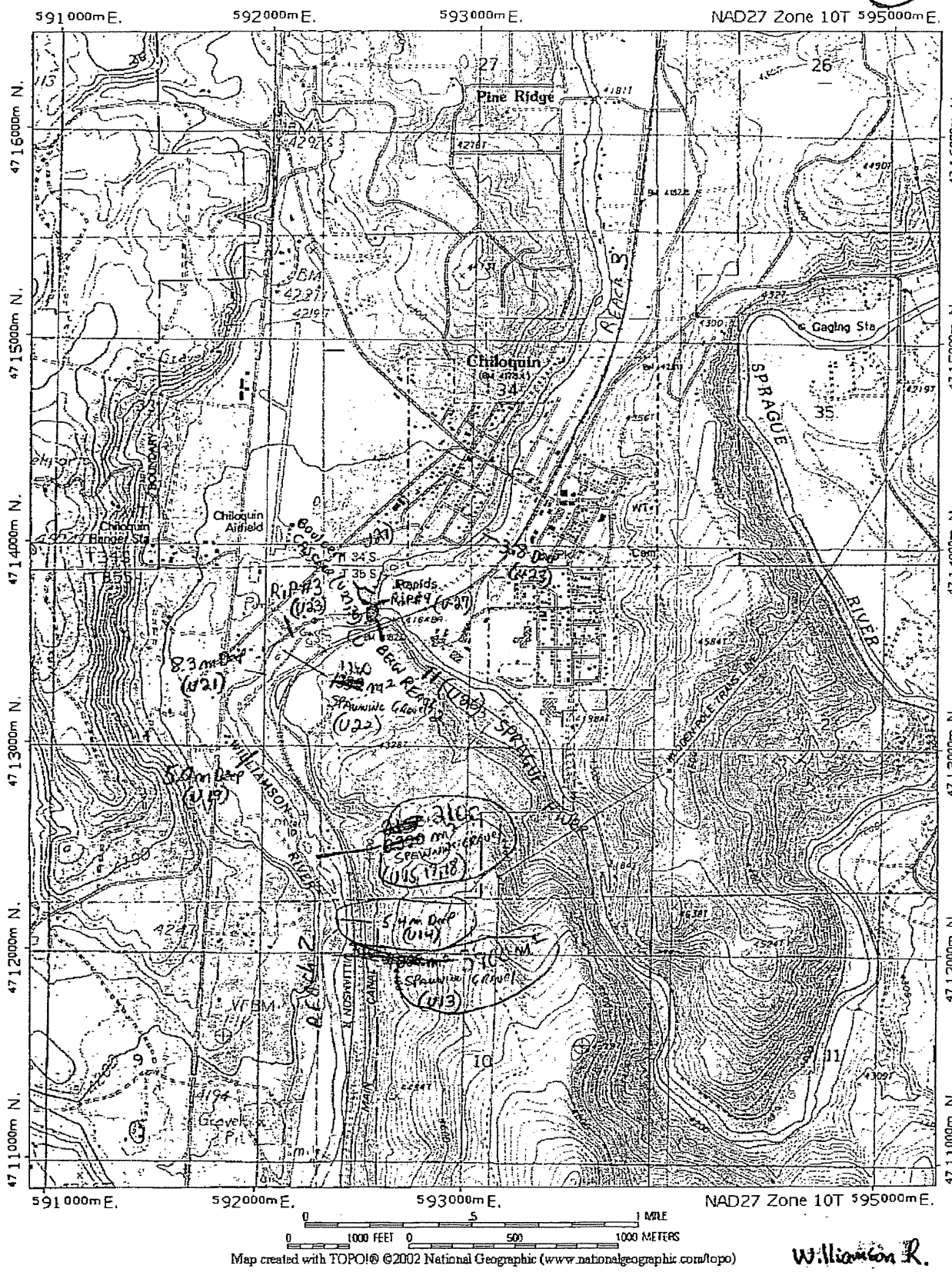
Stream Temperature

Moderate flow from the Sprague River (21.5° C) increased the temperature of the Williamson River from 11.5° C (above Sprague) to 16.0° C (below Sprague).

Photo 31 Unit 15
Riffle had an estimated 1,500 m^2 of gravel/cobble suitable for Chinook salmon spawning.

Photo 33 Unit 20/21
Embedded logs helped alluvium resist scouring and contributed to the formation of mid-channel bars (islands.


589000m E.
590000m E.
591000m E.
NAD27 Zone 10T
592000m E.
47 11000m N.
47 10000m N.
47 09000m N.
47 08000m N.
47 07000m N.
REACH 1
START SURVEY
RIVER
WILLIAMSON
Wilson Cem
Williamson River Pumping Station
Williamson River Vission
Trailer Park
Labert Siding
Gravel Pit
Rip#2
0 1 MILE
0 5
0 1000 FEET 0 500 1000 METERS
Map created with TOPO!® ©2002 National Geographic (www.nationalgeographic.com/topo)
W. Williamson R.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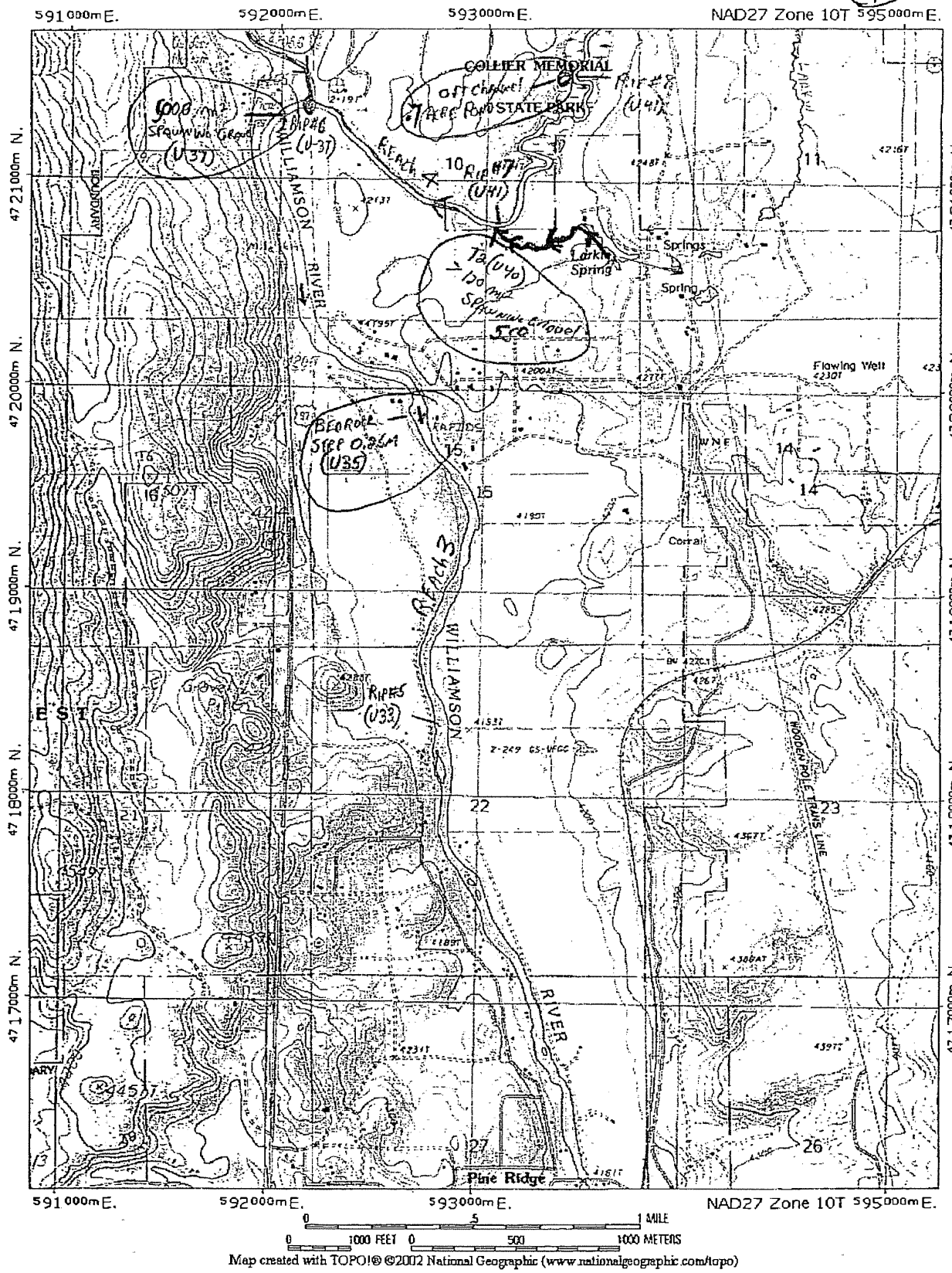
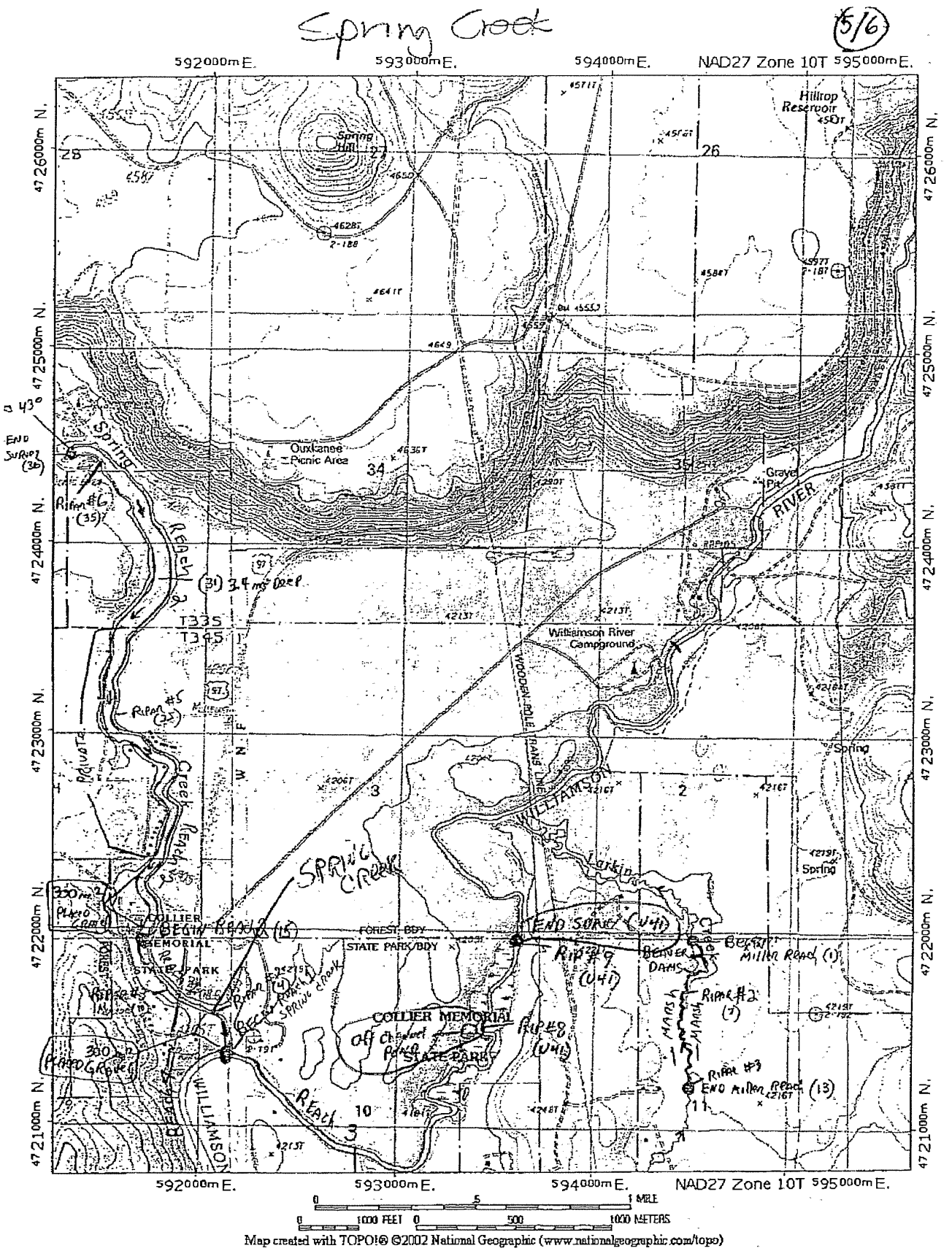
593000mE.
NAD27 Zone 10T 595000mE.
47 16000m N.
47 15000m N.
47 14000m N.
47 13000m N.
47 12000m N.
47 11000m N.
Pine Ridge
Chiloquin
Chiloquin Airfield
Chiloquin Ranger Sta
Gaging Sta
SPRAGUE RIVER
WILLIAMSON RIVER
Rapids
Spawning Gravel
Gravel Pit
Map created with TOPO!® ©2002 National Geographic (www.nationalgeographic.com/topo)


591000mE.
592000mE.
593000mE.
NAD27 Zone 10T
595000mE.
47 21000m N.
47 20000m N.
47 19000m N.
47 18000m N.
47 17000m N.
COLLIER MEMORIAL STATE PARK
Reach 4
Reach 3
WILLIAMSON RIVER
Springs
Larkin Spring
Spring
Flowing Well
Corral
Pine Ridge
WOODEN POLE TRANS LINE
0 5 1 MILE
0 1000 FEET 0 500 1000 METERS
Map created with TOPO!® ©2002 National Geographic (www.nationalgeographic.com/topo)


Spring Creek
5/6
592000m E.
593000m E.
594000m E.
NAD27 Zone 10T
595000m E.
47 26000m N.
47 25000m N.
47 24000m N.
47 23000m N.
47 22000m N.
47 21000m N.
Hilltop Reservoir
Spring Hill
Ouzinkie Picnic Area
Gravel Pit
RIVER
Williamson River Campground
WOODEN POLE
WILLIAMSON
SPRING CREEK
Spring
Creek
Reach 2
Reach 3
Reach 10
Rapid
Rapids
Riffle
Riffle #6 (35)
Ripp #5 (32)
Ripp #9 (U41)
Ripp #8 (U41)
Ripp #2 (7)
Ripp #3
END Miller Reach (13)
END SURVEY (U41)
BEGIN Miller Road (1)
BEGIN RIPP (15)
COLLIER MEMORIAL STATE PARK
FOREST BDY
STATE PARK BDY
BEAVER DAMS
Off Channel Pond
(31) 3.4 mi² Dep
T33S
T34S
R20W
END SURVEY (36)
1 MILE
1000 FEET
500
1000 METERS
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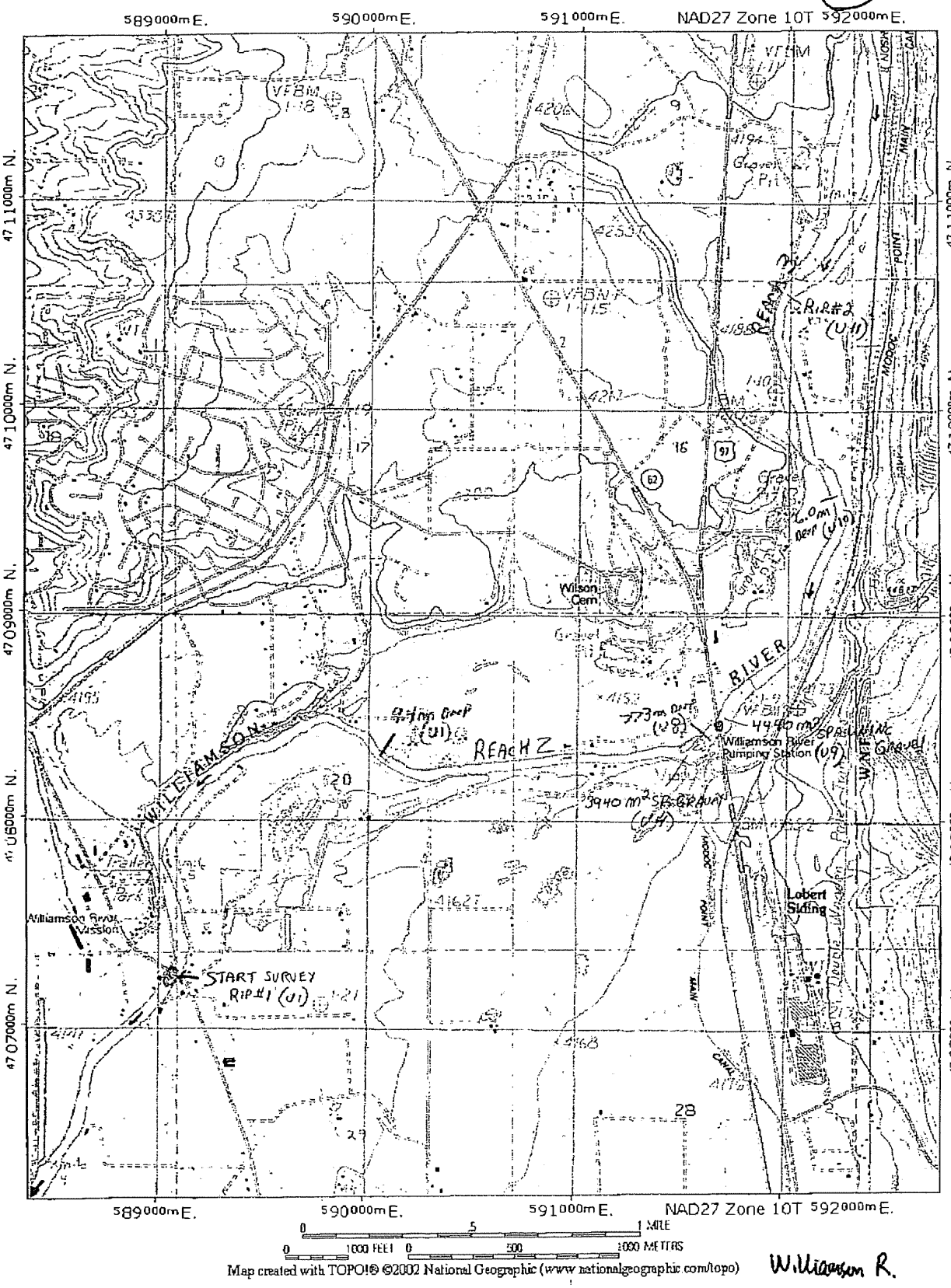
Williamson River

(2/6)



Williamson R.


3/6
591000mE.
592000mE.
593000mE.
NAD27 Zone 10T
595000mE.
4716000m N.
4715000m N.
4714000m N.
4713000m N.
4712000m N.
4711000m N.
Pine Ridge
Chiloquin
Chiloquin Ranger Sta
Chiloquin Airfield
Gaging Sta
SPRAGUE
RIVER
Begin Reach 4,5
Reach 4,5
RIP#3 (U23)
Rapids RIP#4 (U21)
1330 m² Spawning Gravel (U22)
8.3m Deep (U21)
5.0m Deep (U15)
2330 m² Spawning Gravel (U15, 17, 18)
5.1m Deep (U14)
4000 m² Spawning Gravel (U13)
WILLIAMSON RIVER
MAIN CANAL
PROJECT POLE-TRANS LINE
T 34 S
T 35 S
0 .5 1 MILE
0 1000 FEET 0 500 1000 METERS
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W. Williamson R.

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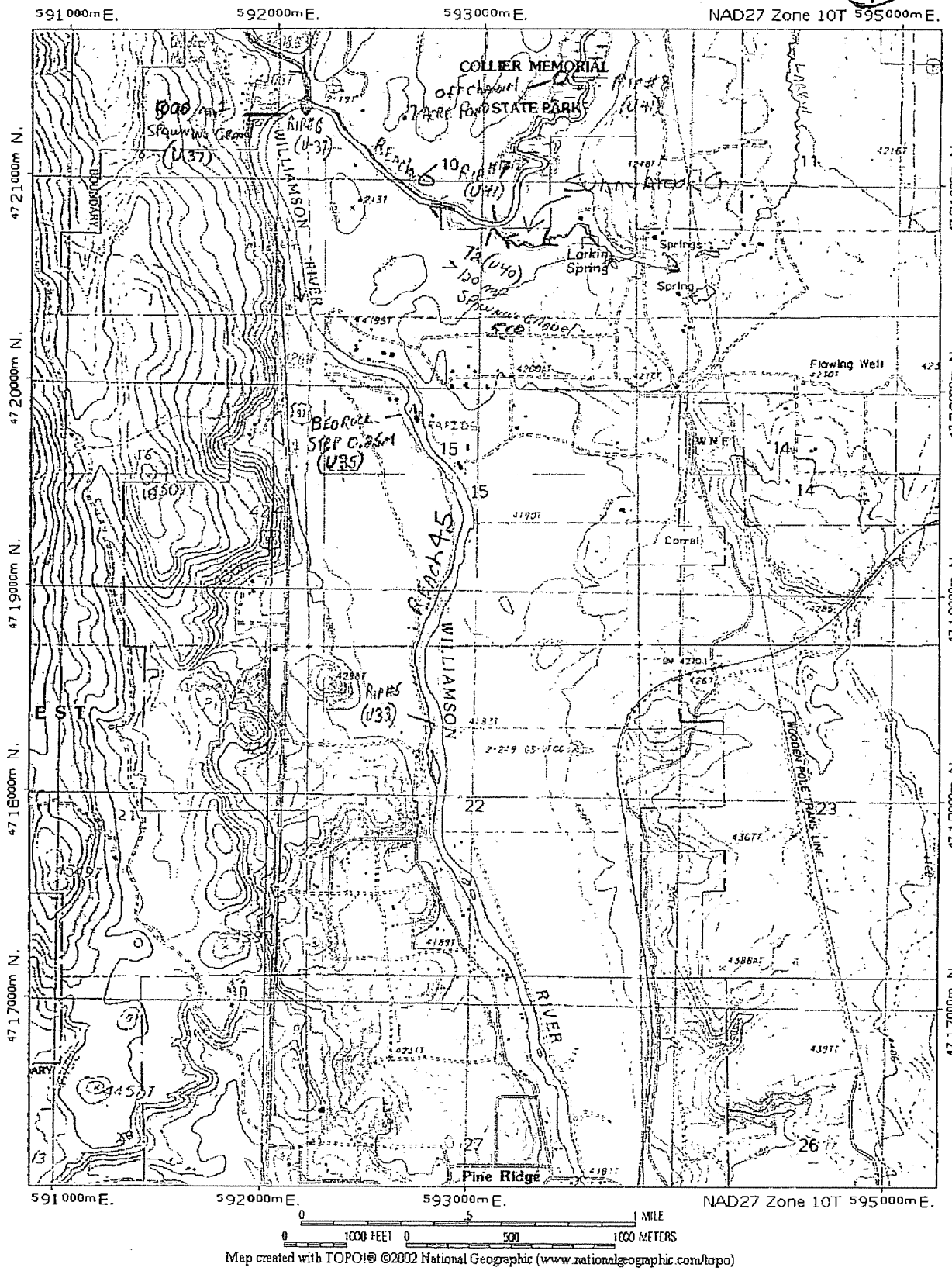
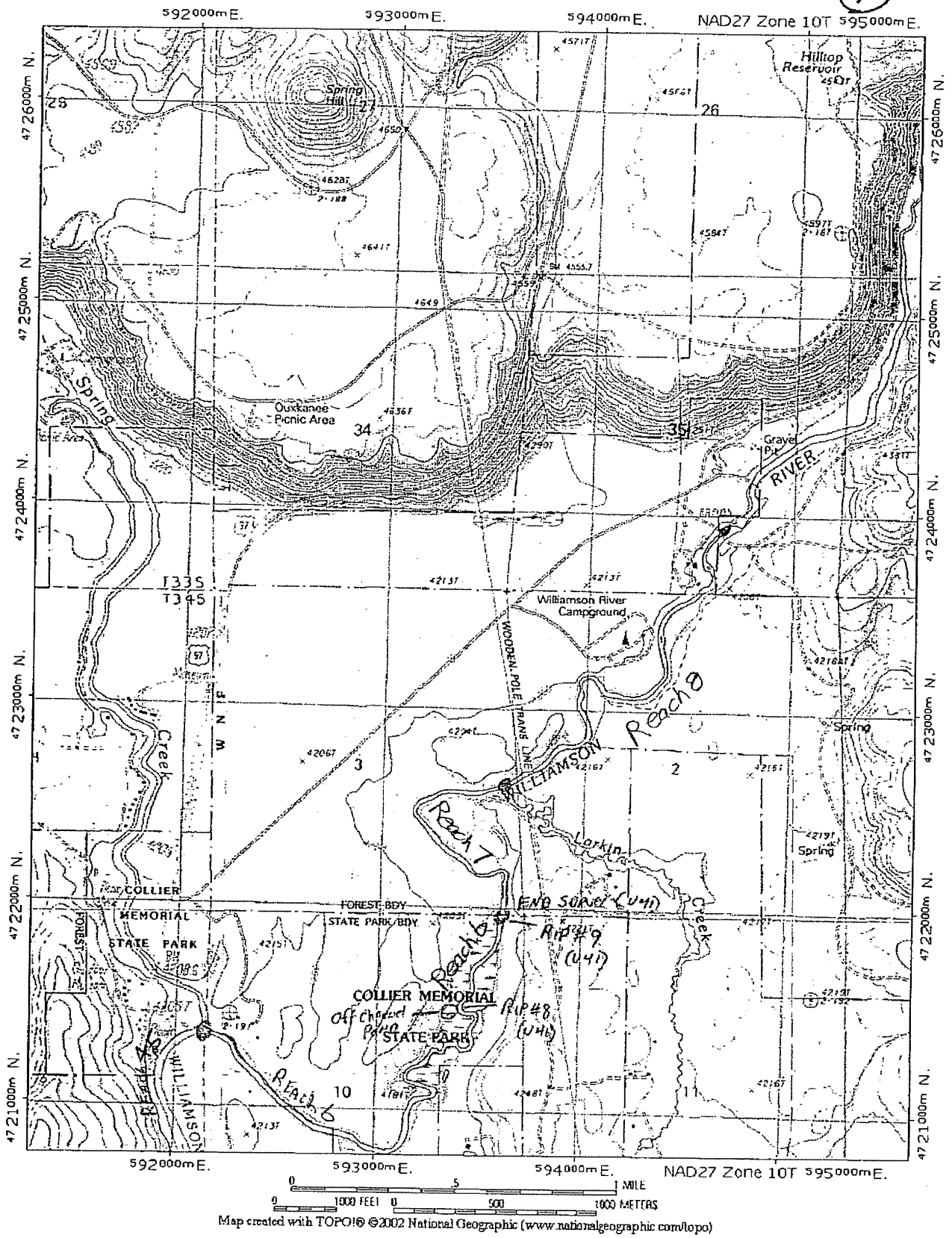

591000mE.
592000mE.
593000mE.
NAD27 Zone 10T 595000mE.
4721000m N.
4720000m N.
4719000m N.
4718000m N.
4717000m N.
COLLIER MEMORIAL STATE PARK
WILLIAMSON RIVER
Reach 6
Reach 7
Reach 5
Reach 4
Reach 3
Reach 2
Reach 1
Reach 45
Larkin Spring
Springs
Spring
Flowing Well
Corral
Pine Ridge
WOODEN POLE TRANS LINE
RIPAS (U37)
RIPAS (U33)
BEDROCK SRP C.26M (U35)
T6 (U40)
T7 (U41)
Squaw Creek
See Squaw Creek
11
14
15
22
23
26
27
0 .5 MILE
0 1000 FEET 0 500 1000 METERS
Map created with TOPO!® ©2002 National Geographic (www.nationalgeographic.com/topo)

5/6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Hilltop Reservoir
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Reach 8
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Larkin Creek
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Off Channel Pond
WILLIAMSON RIVER
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