

Southwest 2020 Potato (*Solanum jamesii*) Collecting Trip Report

Trinidad, CO area, September 14-23, 2020

Collections: Two sites = BBKA 408 and BBKA 409. See Table.

Participants: John (JB = USDA/ARS) and Ingrid (IB) Bamberg, Colin Khoury (CK) and Shadi Azadegan (SA). Full participant affiliation details available on GRIN linked to each collection PI.

Summary logistics, significance of site and outcomes including knowledge and research interests. JB and IB rented 2020 Chevy Silverado 4WD extended cab pickup truck from GRB and drove to Trinidad, CO and back—about 4 days of travel and 7 exploring. Total of 3,672 miles driving. Purchased two waterproof cargo carriers that could be roped and locked down in bed for supplies. Rented cabin at Picketwire Lodge near Stonewall about 30 miles W of Trinidad for all nights' lodging. Scouted for promising habitat and access at many sites. Observed plants at previously-known site at Raton, NM with research significance. Observed plants at previous Bamberg et al. sites which were lost from the genebank in pure form, only represented by outcross hybrids (see Fig 1). Discovered and collected two completely new sites, a particularly important accomplishment as only four total sites are now known in SE Colorado. Over all, this trip proved that potatoes around Trinidad are not almost extinct, but well established, and may even have robust populations if we could discover their location in an ideal season. One other important concept this trip emphasized was that a full week focused on a single small area can result not in the expected conclusion that it is now “done” but instead that you expanded awareness of the many more promising places that you *still* did not have enough time to get to (see Future Work section below). Explored ideas to work with CK on test case validating prediction of sites where potatoes are likely to grow.

Unusual background of this expedition, original proposal, Covid-19 safety protocols. Covid-19 pandemic shut down official travel, and ARS denied special permission for even our extraordinarily careful original proposal to Abiquiu, NM area. This became untenable in any case with the NM ban on out-of-state visitors except after 14-day quarantine. We considered whether there was any practical way to accomplish a worthwhile alternate SW potato collecting expedition for our 29th consecutive year, yet without accepting any significant risk of catching or spreading the virus, and concluded these factors could make it so: 1) select a target site of shortest drive from WI in extreme NE of potato range where sufficient exploration had not previously been done. This site had research interests to add to the anticipated benefit of finding rare new germplasm. Las Animas county was also among the lowest for virus incidence in the USA, 2) Limit participation to JB and IB, privately funded and officially on vacation time (although we took no diversions for leisure), with no formal responsibility or representation of USDA/ARS or USPG, 3) Drive hard to site without using any lodging (slept in truck), no use of public restrooms (bivouac-style accommodation), no inside visits to stores or other enclosed rooms in transit (drive-through and curbside food only using P95 masks, and bringing much of the needed food and supplies in cargo trunks we purchased), and sanitizing common touch surfaces at gas stations and elsewhere with 95% ethanol (Everclear) in spray bottle, 4) rent lodging at target site as free-standing basic cabin isolated and far from city for all lodging nights. For the two days that CK/SA and JB/IB were together, we used separate vehicles, and all time spent together was outdoors and distanced.

Site significance, previous observations and collections. The Las Animas / Trinidad area is the extreme NE range of *Solanum jamesii*, the northernmost potato species. Wild potatoes in southern Colorado are rare, extremely so here in the eastern part of the state. Trinidad is on the Santa Fe trail with a lot of history—for example, we were told that the Masonic cemetery is among the oldest in Colorado. Several 19th century herbarium records exist, but with rather vague locations of only “Trinidad” and “LaVeta” (see details in legend

of Fig 1). In 1996 we found the only known existing potato plants here as a very limited population. In several subsequent visits to the general area, notably in 2017, no additional plants could be found, despite habitats that look very promising. Finding more potatoes here was always a worthy goal, but a hard one to accomplish without the investment of an entire collecting trip. Many local sites and elevations as scouted on maps in advance are ostensibly promising, but, in contrast to other areas, public land is limited. So, in addition to identifying spots where potatoes are likely to exist, one has to also scout accessibility—impossible to determine in advance (see details below).

Map-based scouting, rainfall, and other preparations. NOAA weather records showed a few inches of rain in the month preceding the trip, but locals claimed it was an extremely dry season. A freak snowstorm of 6-8 inches occurred a week before we arrived. As usual, GoogleEarth was used to identify likely habitats in advance which were plotted on Delorme Topo10 on a laptop with that spotted current location with a simple plug-in GPS receiver. Spots of interest were also uploaded to Garmin handheld GPS for use in the field.

Land accessibility issues. There are city and state parks, state wildlife and hunting grounds, cemeteries, historic sites and roadsides which can be freely accessed and have very promising habitat. For example, the caretaker of the Masonic Cemetery was very welcoming, even inviting us to stay and look despite it being after visiting hours. That site had fenced primitive natural J/P land that looked ideal and as if it had had limited human impact for over a century. Then there is “state managed land” which, if any more freely accessible than private land, gives no indication of that on the ground. There is BLM land to the N farther than we explored which might be promising and not too high, if you could get to it with a normal vehicle. The status of private land is less clear. Most road names are “CR” numbered, ostensibly public *County Roads*, yet are often gated and posted to “keep out” of what is claimed to be private communities. It is not always clear if the road itself is considered private or just the land it runs through. In two places where entry to CRs brusquely warned to keep out, locals we were able to talk to seemed surprised at the question of whether it was *really* off limits. In contrast, the entire Gallinas area W of 25 between Trinidad and Raton has a single access road that is boldly posted as private, with the clear intent that only owners should enter, although one has no way of anticipating that from maps. We were thrown off of an unposted unfenced spot within 100 ft of the county road, while in another similar location the land owner we met laughed that we were certainly free to look in the ditch and even invited us to look on his property. Raised in the Midwest, one does not expect that a 10-mile long, well-maintained and formally-named road going to historic or other sites of interest printed on public maps is, in essence, really someone’s private *driveway*. All this is not to say that access is widely unattainable, only that one does not know, so there is the “catch-22” of not knowing whether a spot is worth exploring until you have gone to the considerable effort of finding the landowner who can give you permission just to find out. This region has a lot of paid hunting, so we wondered if offering to pay would open doors. In general, a location like this needs much more preparation in advance with respect to knowing what sites are accessible and getting permission. Access was never limited by roads being too rough.

Costs. We thank K. Williams of PEO for \$7.5K funding to be used for 2021 expedition. Bambergers’ total personal trip expenses = \$2300.

Future work. If DNA analysis in progress shows the 2017 collection at Raton (686440) observed during this 2020 trip to be a “pico-pop” (large ramet of a single genotype that does not reproduce as seed by sib mating at the genebank) it may be worthwhile to re-collect to confirm it is really so genetically narrow. Should get land ownership contacts and get permission at spots we now know are most promising but were posted. Look for more public sites, especially very old historic areas and cemeteries that would not have been disturbed since 19th century herbarium collection reports. Spend more time around the Santa Fe trail and otherwise East of Trinidad. More exploration at public lands of Trinidad Lake State Park (TLSP) and Bosque del Oso. Hill Ranch Road (N37.121908° x W104.776161°) goes S through ostensibly great habitat all the way to NM, and could be a good place to ask for permission—it is listed on Colorado Parks and Wildlife website. Check into access opportunities for “state managed land” we observed posted “keep out”. Spanish Peaks SWA is N farther on Burro Canyon Road than we explored. Time was insufficient to fully explore Santa Fe trail

NE of Trinidad. Sites S of Rt 12 similarly were explored less than warranted by the fact that they would be between known sites N of Rt 12 and known sites in New Mexico. Explore potential of help from local botanists. All the above especially could be prepared in advance to be deployed after a couple of years of abundant seasonal rainfall provided the best chance of potato plants being present. Our previous collections were in late summer, but the three very old herbspec reports are from remarkably early summer (Fig 1) so maybe exploration should be attempted three months earlier in the season. Efficient transfer of living specimens from the wild to the genebank remains a problem that needs work. Would survival of plantlets be improved with the special grow plugs we use for seedling transplants at USPG? An experiment could be set up in this area with CK testing the efficiency of predicting sites where potatoes will be found based on habitat data. Finally, staff at Trinidad Lake State Park told us of Potato Patch Campground N of Stonewall, which locals assume was named for wild potatoes growing there. When we went there, it was clearly too high, and the camp host showed us where the spring was dammed to allow irrigation of a small field said to be used to grow (cultivated) potatoes many years ago (see Fig). We could inform Trinidad Lake visitor center and maybe other local outlets like the museum, perhaps in a brochure as a segue to describing the true status of local wild potato in Las Animas county.

Deposit of records, germplasm and files:

US Potato Genebank, 4312 Hwy 42, Sturgeon Bay, WI, 54235. 920-743-5406. john.bamberg@usda.gov. Query BBKA collector prefix or individual PI numbers in GRIN. Detailed trip log, GPS track and Waypoints files, and additional photos and miscellaneous notes are available from JB at USPG.

Daily itinerary

Sunday, September 13. Drive to GRB to pick up rental vehicle. Sanitize and air out before driving back home. It had been unoccupied since the previous day. Leave truck sit for a few more hours, then begin packing.

Monday, September 14. Finish packing perishables into truck. Leave 7 AM, south on Hwy 57, 41, 26, and 151. At 10 AM stop in Madison to pick up face shields and coffee. 10:15 AM leave, west to 80 to Iowa and into Nebraska. Eat lunch and supper while driving; pull off highway twice for gas. Drive-thru at Taco Bell in Fort Morgan, CO, at 1100 miles from home at 11:20 PM local time, parking on residential street to sleep in vehicle.

Tuesday, September 15. At 4:10 AM awake, at 4:20 AM back on highway, west toward Denver. At 6:40 AM exit into Colorado Springs for drive-thru Starbucks, picnic breakfast in park, and gas. At 7:55 AM back on 25S. At 9:45 AM enter Los Animas County, 10:05 AM reach Trinidad, keep driving south to Raton, NM Exit 454. Park 10:30 AM beside guardrail below previous collection site 686440 from Bamberg et al., 2017. Note many *S. jamesii*. Abundant, but probably fewer plants than in 2017, certainly much less mature despite being visited a month earlier in 2017.

At 11:05 AM back to vehicle and drive back into CO. Search extensively at four areas S of Trinidad off 25: 1) E below scenic overlook at McBride Creek, 2) Exit #2 Wootton E side of 25, 3) creek bottoms along the road by double underpass under train tracks, 4) at cattle chute near where road is blocked to the N (see Fig). Contrary to impression from maps, there is no public access to habitats W of 25 between chute and Starkville.

At 1:20 PM back in Trinidad, curbside pick-up order at Tequila's Mexican Restaurant for picnic in Kit Carson Park. Search around monuments placed in 1908 and 1912. Drive-thru Burger King sandwiches to be eaten later. At 3:50 PM arrive Picketwire Lodge & Store to check-in, unpack truck, eat supper and plan. Study of maps before the trip indicated many possible places to search, and we intended to spend Wednesday scouting sites most accessible and with most promising habitat.

Wednesday, September 16. Up at 6:45 AM, make breakfast, pack lunch, clean up kitchen, plan. E on 12 and stop at Apache Canyon Camp and nearby canyons in Bosque del Oso SWA. Leaves under pines and gambel oaks on N-facing slopes looked good. Then continue south to lower valley until vehicles not permitted. Good place for more searching, but a bit high. Retrace road to 12 and E to road to Ciruela Canyon. Farther E on 12 in

town of Weston, attempt to go S on CR 31.9, but it was gated. E to Bosque del Oso road E entrance between mile markers 48 & 49 on Rt. 12. Under cottonwoods looked very good at intersection and to Alamosito Canyon. Rough and rocky road. Places along road until fork in road looked very good. Elevation at road fork = 7050 ft. Might be promising place to return to for more looking. Back to 12, then E to abandoned old church right next to road, N37° 07.746' W104° 47.962', elevation 6744 ft (dripline under roof might collect moisture). Then N on paved CR 41.7. Scout a few accessible ditches that looked very good, but most land private, fenced and posted. Retrace to 12 after about 5.4 miles. Back on 12 to CR 43.2 "No Trespassing". To CR 43.6 with residences, then posted "Keep Out". Make note to consider looking in Segundo town on Rt. 12 roadsides. Continue E then turn off 12 at abandoned gas station on corner at CR 47.7 (N37.125367° x W104.708495°) and S over river. E on CR 18.2, N-facing ditches looked good. Retrace W through 47.7 intersection and around Valdez community that dead ends in a place with sign as "BAMM Inc." Looked in ditches to N by trestle, grassy boulevard with shrubs and trees. Moist black soil on N-facing slopes looked like good habitat. This spot could be searched more. Back to 12 and continue E to Burro Canyon Rd CR 53.5. Just past bridge over river (about 1 mile from 12), stop to look in grassy flats on E side of road below crescent ridge facing W. Four plants seen, only 1-2 inches, green. [**Collection BBKA 408**]. Continue N to previous germplasm site Bamberg et al. 595785 [1996] and 605360 [1998] (see Fig.) to observe more potatoes around rocks and under two large bushes. Five or six colonies of up to 10 plants, green, up to six inches. Return to 12 and E. CR 55.7 is to the N between mile markers 61 & 62 noted for possible return later. Continue E then N on CR 57.7, the road to Cokedale settlement. Looked on one N-facing slope by a bridge. This area looks favorable for searching later. Turn around at The Okuns, #13011 and return to 12 and continue E. Between mile markers 64 & 65, S side of 12 where trees are inside of border fence could be promising place to look. Continue E to Trinidad, Kit Carson Park for late lunch at 3:55 PM. To Masonic Cemetery. Caretaker just locking gate for the day at 4:30 in pickup, stops to talk, welcomes us to park outside, walk in and look. Very good habitat in natural J/P to S of area of burial plots. Warrants more exploration another day. Drive to Simpson's Rest lookout over Trinidad. Look along access to north face and under J at top. From this lookout 300 ft above the city, noted green areas in Trinidad and to NE along Santa Fe trail to explore. Return down to Trinidad and Linden street to fairgrounds--closed. N to Kentucky Ave, along which junipers in sand provided what looked like very good habitat. Dirt road continued E as narrow tunnel under 25 with standing water. Pick up two fish and two fries at McDonald's drive-thru when leaving town. Stop at historical marker on N side of 12 across from Trinidad Lake State Park entrance to look around and complete daily Duolingo lesson within range of internet. Delta to N above Trinidad Lake N of 12 noted as place to look later--cottonwood bottom with rich black soil and many green herbs, including solana. Map says this is part of the state park. Return W on 12 to Picketwire, arriving 6:50 PM.

Thursday, September 17. Today the main goal was to scout W foothills of Trinidad and sites N near LaVeta. At 8:20 AM leave Picketwire. E on 12 to TLSP and historical marker to take photo of plaque. Look more in TLSP delta to N. Order food & supplies online for pickup at Trinidad Walmart. Continue east on 12 to CR 67.3 N. Single lane through residences; pavement ends, but smooth gravel. Mostly fenced and posted private land but some ditch habitats with trees looked promising. Return to 12 and drive into Trinidad to explore four areas on west edge of town scouted from home from maps and targeted by virtue of appearing to be steep shaded arroyos facing E. But on the ground they were unsuitable open, dry habitat, and fenced and posted. Sandwiches from McDonald's drive-thru for early lunch while going N to Walsenburg. Looked in very old St. Mary's Catholic Cemetery at corner of CR330 and 25B N37.617322° x W104.773524°. Looked like this could be very good habitat in a wetter year. Continue west to LaVeta. Corral at corner of Ryus street and Poplar Ave. Then NE along Valley Rd and railroad tracks-- not very promising habitat here. Retrace to 358. Stop at Wahatoya Lake State Wildlife area where habitat looked possible, but dry (N37° 30.671' W104° 59.289'). Next, LaVeta Cemetery; all neatly mowed so no chance for potato "weeds". Stop at historic Goemmer Stone Barn building (1895) at corner of Field and Oak streets to look around grounds. Drive to old railroad station and visitors' center to park N37° 30.588' W105° 00.638'. With the Cuchara River and railroad, this was the center of activity

in old LaVeta, perhaps suggesting the most likely place where potatoes had been noticed. Searched in wide area, walk to river, and along banks—looked very good habitat. Gas stop, then NE on 160 to Lathrop State Park. Buy Daily Pass, park to plan strategy, drive to Youth Pond parking lot. Search wide area. Sandy, shady open dunes with large junipers under which duff holds moisture for herbs-- looking like ideal habitat. Phone call with CK to arrange meeting tomorrow. Park Pinon Campground and search extensively around amphitheater and giant boulders (provide shade, protection from grazing, trap moisture) to N and W along Hogback hiking trail—looked like very good habitat. Return E through Walsenburg and S to Trinidad for fast food supper and Walmart contactless grocery pick-up all sanitized with alcohol on back of truck before use. Arrive back at Picketwire Cabin #2 at 7:30 PM.

Friday, September 18. At 8:45 AM CK and SA join JB and IB on veranda of Picketwire store. Introductions and discuss plan. E on 12 to Burro Canyon Rd and N to observe plants JB and IB had already seen on Wednesday. Landowner stops to say bluntly that we are trespassing and need to leave. He rents access to elk hunters. Denied permission even at this one unfenced spot a few hundred feet from roadway. To Trinidad and S to Raton 25 onramp site visited on Tuesday.

N to 25 exit #6, Gallinas. Ramp curves under highway and comes to a T posted “Santa Fe Trail Ranch Community – PRIVATE”. Turn around and park along curving ramp to explore N-facing bluff, and areas on each side of the ramp. Some spots looked quite good. Return to Kit Carson Park in Trinidad for picnic lunch. Then return to Masonic Cemetery for more deliberate search. W edge with E-facing slopes and unused natural areas looked very good. Simpson’s Rest. W on 12 and N on CR 57.7 at Cokedale Rd. Look for suitable habitats inside fence with trees and close to a pull-off. Less than 5 miles from 12, stop to check out ditches. Landowners stop to talk. Give permission to cross gate into their land to look for wild potatoes. Part ways with Colin & Shadi for the day (who are lodging at Stonewall). Return to Picketwire 6:46 PM.

Saturday, September 19. CK and SA arrive at Picketwire. At 9:10 AM leave for Cokedale settlement. Cokedale Mining Museum and Post Office closed today. To N end of Elm St and up Church St to where road is posted “Private”. Look around the park in Cokedale town—habitat not very promising. Speak to local motorist who says land along river between town and CR 57.7 is not private and can be accessed by anyone although warned to watch out for snakes. Looked extensively along both banks of running creek and the roadsides. Moist grassy bottoms. Some sandy dunes shaded by E-facing steep canyon walls looked very good with green herbs. Similarly, shady leaf-covered flats on E side of watercourse. To Trinidad State Park, buy Daily Pass. Park by Carpios Trail picnic area. Split up to search in all directions. Classic juniper habitat looked very good. Picnic lunch. To 12 and the next TLSP to E that crosses dam. To CR 18.3 which again ends in posted private community. Return to boat dock on N side of dam to park and extensive search—this habitat looked very good, especially under trees and brush in the arroyos that drain to the lake from the N. Here JB talked to the park staff J. Fernandez, longtime local resident who said Potato Patch Campground in the Stonewall vicinity was reputed to have wild potatoes. To 12 and W to CR 55.7 and N, but again soon gated and posted “Private”. Continue W on 12 to Stonewall and Monument Lake Resort to the North Fork Trailhead turnoff in San Isabel NF. Drive to Purgatoire Campground to inquire of campground host about origin of the name of nearby “Potato Patch”. Much too high here for wild potato, but rather was an irrigated field of cultivated potato many years ago. Final good-byes to CK and SA, who will return to Ft. Collins the next morning. JB and IB return to Picketwire lodgings by 5:50 PM.

Sunday, September 20. At 9:15 AM drive S on 13N from Picketwire. Elevation too high here and anywhere W. Intention for this day was to follow up on previous scouted sites that deserved more searching. On 12 E to Park & Ride lot, <1 mile S of Cokedale road, at steep N-facing valley with creek on N side of road (37.133637° x -104.624033°). Around running creek at bottom looked very good. Checked S side across road too. Then W on 12 to CR 57.7 Cokedale Rd, N to CR 30.1 through Boncarbo, curving to W to intersection of CR 53.5 Burro

Canyon Rd. and proceed S. Stop to talk to residents in a driveway about CR 53.5 being private. No—it is a public “CR” *county road* after all, and that is how everybody gets back S to highway 12. Stop to look within state-managed land (according to Topo10) and in ditches elsewhere. This is vicinity of Bamberg et al. 1996 collection (595786). Looks very promising and much like habitat where plants were already observed on this trip about 3 miles S. Continue S on CR 53.5 to Rt 12 intersection, and search. Now attempting access to habitats W of 25 to S of Trinidad. S at TLSP road CR 18.3, pass CR 67.8 posted private. Join 69 at E Railroad Ave through Town of Starkville. Drive 69.1 to end of road to search. Retrace route, look at promising habitat where road crosses Raton creek. To Trinidad and curbside pick-up of lunch from Tequila’s Mexican Restaurant. Look around Cedar Ridge mobile home park entrance (N37.144224° x W104.513977°) where J/P habitat looked very good at 6300 ft. Continue to Trinidad Catholic cemetery for lunch and search undeveloped woodlands at 37.177876° x -104.482679° to S of burial grounds, much like seen at the Masonic Cemetery. Explore around Historic Fort Wooton Memorial Square in Trinidad (First and Chestnut streets). West on 12 to CR 67.3 and N to look at state-managed land (according to Topo10). No indication that access is more free here, but we took down the number of state office on the sign. Not particularly promising habitat here anyway. Back to 12, park at roadside pull-off between mile markers 64 & 63 to search as there is a considerable swath of J/P accessible inside the fence on the S side of 12 on a S-facing slope. Habitat here looked very good. Then S on CR18.3 to look in Long’s Canyon, but this is private and increasing to less favorable elevation. Looked a few places along ditch. Return N to 12, drive W to paved CR 41.7 which we had previously identified as a promising location. Discover *jamesii* at completely new site about 8 air miles from potatoes on Burro Canyon Road in very similar habitat-- grassy flats in bowl of curved canyon ridge to E of road. This site very significant as only known potato population in SE Colorado not on Burro Canyon Road. [Collection BBKA 409]. Back on 12 and W to Picketwire lodging arriving 6:00 PM.

Monday, September 21. E on 12 to town of Weston and N on CR 31.9. Stop to look several promising places, including at mile marker 3 and between mile markers 6 & 7 at San Pablo Canyon. Retrace to 12 and E to CR 47.7 to look in Valdez area. Then to Widow Woman Canyon road S of 12. Marked “Private” and not for public access. But talked to employee of Panhandle Oilfield Service working at facility at entrance who seemed surprised that the road would be considered closed. Back to Picketwire by 1:00 PM for lunch and afternoon pickup and prep for return to Wisconsin early on Tuesday.

Tuesday, September 22. Depart 7:00 AM to Trinidad, N on 25 to drive-thru Starbucks at Colorado Springs. Continue to Denver and NE on 76 to McDonald’s drive-thru lunch and gas at Sterling, CO. Supper at Overton, Nebraska truck stop Taste of India curbside eaten on the road. Gas stop at Neola, IA then at just over 1,000 miles from Picketwire and almost to Iowa City, stop Tiffin Rest Stop to sleep.

Wednesday, September 23. Up and driving again 6:50 AM and to Mt. Vernon, Iowa Cabin Coffee Co for drive-thru then picnic breakfast in park. At 10:15 AM cross Mississippi River at Dubuque and into Wisconsin. Noon Madison Maharana Indian food curbside eaten in Sun Prairie park. Gas at Kaukauna. Arrive home at Sturgeon Bay 3:35 PM.

Thursday, September 24. Take plants to USGP greenhouse. Return rental vehicle to Enterprise at GRB.

Germplasm collections and observations detail

Table . List and narratives for collections

Place	sp.	Date	BBKA	PI	Plants Collected	Tubers collected	Fruits collected	Seeds collected	State	Genebank seed increase number
Burro Canyon Road	jam	Sept 16	408	695155		1			Colorado	
Horn Spring Canyon	jam	Sept 20	409	695156	7				Colorado	

PI 695155. BBKA 408. *S. jamesii*. United States. Colorado. Las Animas County. Near Trinidad. W from Trinidad on 12 and N on Burro Canyon Road CR 53.5. One mile N of 12 at 1/3 mile S of Bamberg el al. 595785 [1996] and 605360 [1998]. E side of road in flats below (W of) the ridge. At WSG N37.136277° x W104.656454° and 6400 ft. September 16, 2020. Three very small green plants. Under trees. Habitat and topography very similar to that of BBKA 409. Collected one daughter tuber.

PI 695156. BBKA 409. *S. jamesii*. United States. Colorado. Las Animas County. Near Trinidad. W from Trinidad on 12 past Segundo town to Horn Springs Canyon Road CR 41.7. Then N about 5 miles. In flats <100 ft E of road in crescent of E ridge of steep canyon. At WSG N37.180028° x W104.802331° and 7000 ft. September 20, 2020. Several clusters of up to 10 plants up to 6 inches, not senesced, not flowering. Mostly in open grassy meadow in brown soil, protected by large boulders, brush, under trees. Habitat and topography very similar to that of BBKA 408. Collected 7 rooted plantlets.



Photographs and maps

Fig. 1. Scouting previous and promising sites.

Topo10 map used to mark spots in advance and record locations in the field.

“Trinidad”

SM Tracy [June 8, 1887]

<https://swbiodiversity.org/seinet/collections/individual/index.php?occid=2841337&clid=0>

Alice Eastwood sn [June 1891]

<https://swbiodiversity.org/seinet/collections/individual/index.php?occid=13781391&clid=0>

W of Trinidad on Hwy 12 and N on Burro Canyon Road...

Bamberg et al. 595785, 595786, 605360 [Sept 25, 1996; Sept 25, 1996; Aug 13, 1998 respectively]

<https://npgsweb.ars-grin.gov/gringlobal/search>

“LaVeta” area about 25 miles north...

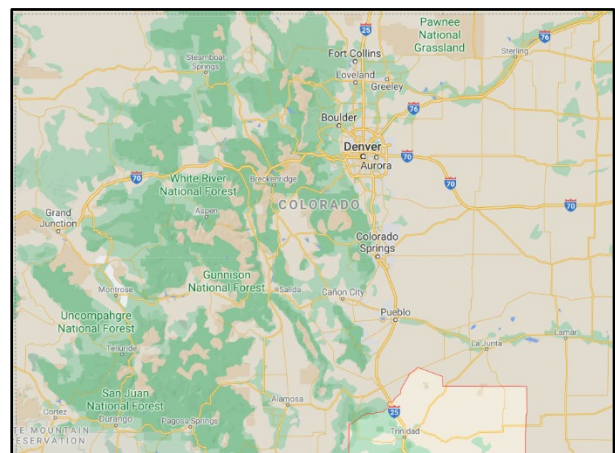
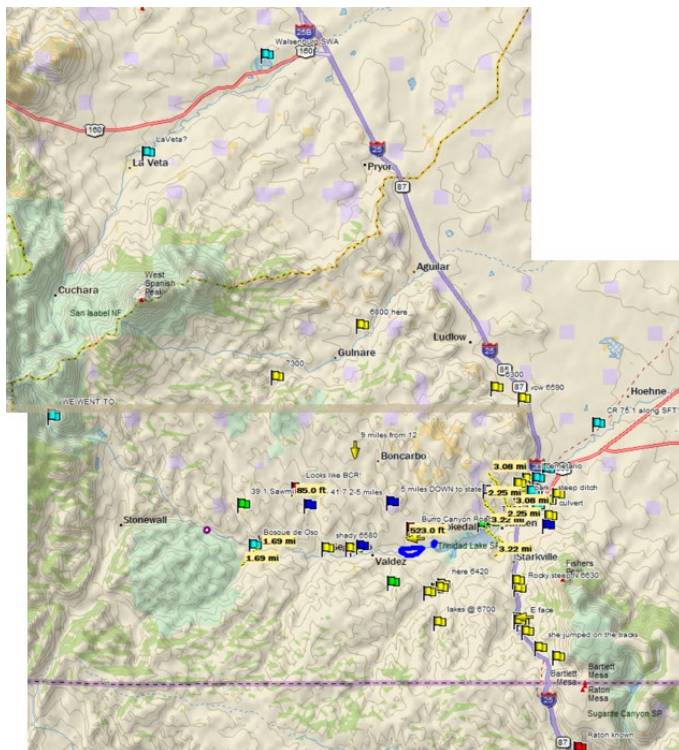
CL Shear 2575 [July 14, 1896]

<https://swbiodiversity.org/seinet/collections/individual/index.php?occid=2841152&clid=0>

... and also at Raton, NM

Bamberg (686440) [2017]

<https://npgsweb.ars-grin.gov/gringlobal/accessiondetail?id=1957730>



Las Animas Co.



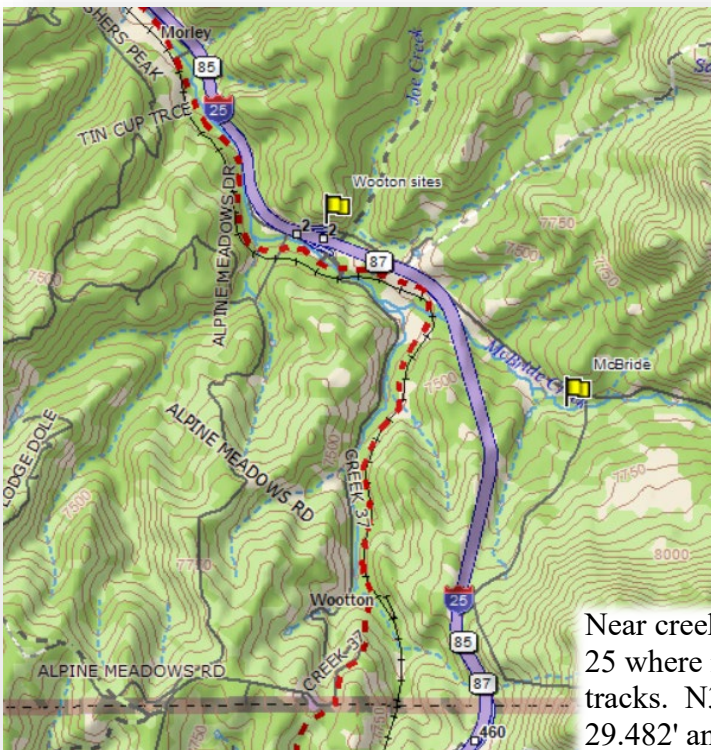
Outbound. High clearance 4WD extended cab good choice and most economical.



Cabin #2 at Picketwire Lodge at 32 miles W of Trinidad was sole lodging.

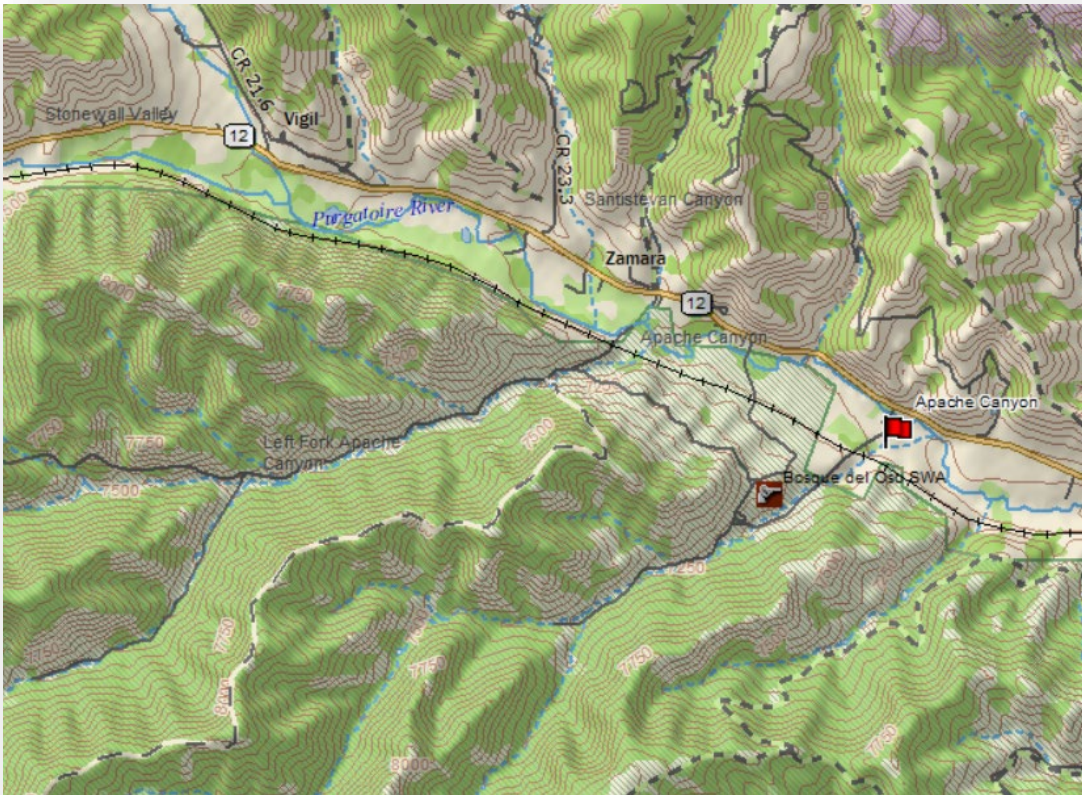


Sept. 15th. Many places in this area are ostensibly quite promising for *jamesii*... E-facing, moist valley, shade and duff cover at 7500 ft elevation (↑). Scenic vista pull-off just inside CO at Raton Pass on 25 at McBride Creek.

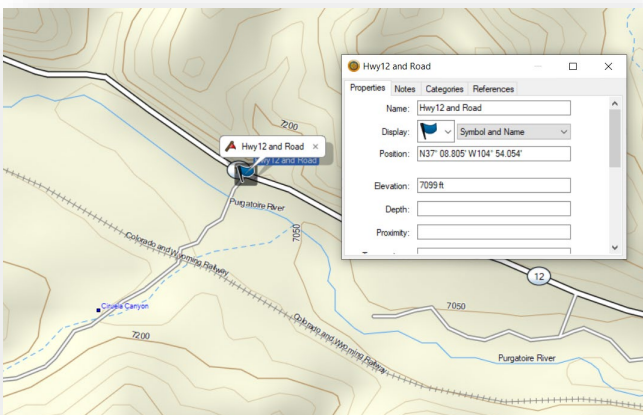


Near creek at Wootton, exit #2 on 25 where road goes under train tracks. N37° 01.160' W104° 29.482' and 7200 ft. (↑) Cattle chute (→) near Wootton, 25 Ext 2. At N37° 01.265' W104° 29.774' and 7100 ft.





Sept. 16th. Scouted and looked at promising canyons in Bosque del Oso State Wildlife Area.



Sept. 16th. Road to Ciruela Canyon.



Burro Canyon Road
CR 53.5 sites habitat.





Potato Patch Campground

