Southwest 2017 Potato Collecting Trip Report

Southern Colorado border and NE New Mexico. September 17-26, 2017

Genebank participants: John (JB) and Ingrid (IB) Bamberg, Alfonso del Rio (AdR), Charles "Chico" Fernandez (CF). All affiliations: US Potato Genebank (USPG), 4312 Hwy 42, Sturgeon Bay, WI, 54235. Collection prefix = BdRF numbers 348-359.

1. General Goals, Outcomes, and Observations:

El Morro. The goal was to make a stop at the beginning of the trip at field plots growing at NMSU farm at Farmington, so the route west of ABQ took us to Grants and near El Morro National Monument where jam had been observed to be very abundant many years ago as BKPF 078 [1999]. However, we found very few plants at El Morro National Monument campground, but a collectable population just W at Ancient Ways Cafe at El Morrow town, and a few plants in poor condition on 53 between there and Grants.

Farmington. Five-hill plots of all available jam collections were planted in a field plot at NMSU replicating the same grow-out in 2016. They were green, flowering, and many with abundant fruit and bumblebees working the flowers.

Mesa Verde. Navajo Canyon in Mesa Verde National Monument (MEVE) was the site identified in 2012 as a mega-population (Bamberg et al. 2016, AJPR 93:564-571), by far the most abundant and genetically diverse population of jam discovered to date. We explored many likely places all around MEVE with hopes of finding a source of germplasm not subject to the onerous restrictions on sharing in force from National Parks. We were greatly restricted by sternly posted private land. We found no jam at all anywhere around Cortez. This was not surprising because the nearby plants in Navajo Canyon were very few, localized, small, dead, dried up and inconspicuous. Collecting in MEVE would need to be done after carefully monitoring the situation until plants are presenting themselves in super-abundance again as in 2013. Is invasive cheat grass threatening the potatoes? We have identified this as the best place for jam diversity but was alarming to see reduction in population fitness and size. We were counting on this place as an important natural reservoir of diversity, not only because of diversity per se, but for the very large pop size that in most cases can effectively buffer genetic drift. But we notice now that the population appears very vulnerable. So the point is that if negative impacts are taking place and if the trend continues, at some point a decision has to be made to actively safeguard this population.

Southern Colorado. We took 160 E all the way across southern Colorado to Trinidad, stopping at many sites pre-scouted as promising elevation, aspect and vegetation. In some cases, we were generally guided by some very old herbarium spec reports. One spot searched was near Del Norte at a former residence of Dr. S. Thompson, NDSU potato breeder, who claimed wild potatoes had been growing in her back yard many years ago. There we did find many plants of a form of American nightshade that one could very easily mistake for jam. We essentially found no potatoes in southern Colorado despite visiting sites at which the habitat looked quite favorable. The only exception was observation of a single small weak jam plant at one of our previously-discovered sites in Burro Canyon W of Trinidad, Bamberg 62 [1998].

Northeast New Mexico. Samples in the genebank from this area at the NE extreme of the potato range in the USA are few and from sites where the populations are not localized, and not very robust or easily accessible. We searched the Raton area extensively, finding only a single robust population in the public road cut of interstate 25 at Hartman 63639 [1998]. Then going S on 64 we found very good populations in the valleys to

the W, like at the NRA facility and the roadside pulloff in Cimarron Pass (64W). We then followed 25 to Turkey Mountain W of Wagon Mound town, finding a few plants, and continued to previous sites near Rowe (finding nothing) and around Pecos (finding a few plants). We obtained permission to search in Glorieta Camp, finding a truly magnificent population in the valley at the north end of the facility.

Albuquerque area. For the last day we went to Magdalena area (W of Socorro) where fen had been reported as Frank Hiler 14 [1921]. We found only very small dead jam, but quite a few, and regularly with a single large mature tuber, and sometimes with a single mature fruit. Thus we made two new collections on 12 W of Socorro, and re-collected a third, the Magdalena original site, where previous collections were noted to have particularly large tubers. In the afternoon, we visited a previously-reported site, (Tafoya MT77 [1977] about 20 miles E of Albuquerque off 40. Here also were many small, dead plants with single mature tubers. This #12 collection was mistakenly given the label "Hartman".

Thus, on this single trip we saw only jam, but a very broad spectrum of presentations. We saw plants that were very large and green with many mature fruit and not-quite mature tubers, but also spindly, bright yellow plants, and also completely dead and dried up, small, copper-brown plants in open sun in hard, powdery-dry soil that were very inconspicuous and only confirmed as potatoes after digging up their tubers. Thus, depending on the particular site, one might conclude it was a very good year and time to look, or a very bad year and time. These observations reinforced again the idea that a very vigorous population may appear to be very weak or totally absent in a different year. This also means that searching an area unsuccessfully in a particular year is not conclusive evidence that no potatoes exist there. For example, we looked hard all around Raton, finding only a single spot with hundreds of plants, but nothing at all in many other nearby, ostensibly similar sites. In many general areas where wild potatoes might plausibly exist (like all across southern Colorado) there are thousands of localized spots with habitat that makes one conclude a colony might exist there. After 25 years of such searching for new colonies of wild potatoes, we like to think we have built up a great deal of skill in predicting where they will be, but persistence and luck are also important factors. We intend to soon write a summary of advice and observations on 25 years of collecting in the US to complement our previous similar work after a decade of work (Bamberg et al., 2003, AJPR 80:159-172).

2. Preparations:

Permit from USFS for all NFs of the Southwest Region (see Permit section). Garmin GPSs borrowed from PEO, and uploaded tracks, waypoints and notes from DeLorme Topo10 and GoogleEarth. We reviewed all known potato sightings and herbarium records (particularly from SEINET) and also spent much time using maps to scout and list promising new sites to explore before the trip. As in previous years, GoogleEarth aerial photos were very helpful in showing the exact ground cover, aspect (steep and shaded NE preferred), elevation, and soil moisture potential of the micro-locations which are the small niches in which potatoes are most likely to appear within a general area. This has to be done by prioritizing the most promising sites that are most rapidly accessible (ideally on paved roads) near the general trip loop (see map) to efficiently spend travel time. We navigated on roads mostly by laptop; recorded sites explored, and collection sites in the GPS. Some division of labor made collecting more efficient: AdR navigating; JB driving; IB taking detailed collecting notes from JB's dictation; CF collecting tubers, carrying and indexing tubers and fruit, extracting seeds and establishing plants at USPG. All took photos. As in previous expeditions, the conclusion was again reinforced that models based on *general* eco-geo parameters are virtually useless for predicting the micro-habitats where potatoes may be found.

3. Logistics:

Travel was by air to Albuquerque, then we rented a Jeep Grand Cherokee 4W drive vehicle which we drove a total of 1856 miles. We collected fruits, tubers and plants as usual. All fruit were treated with 6.5 ml/L imidicloprid insecticide to kill fruit fly larva although fruit this year was unusually free of oviposit scars that indicate infestation.

4. Germplasm:

Solanum jamesii populations were sampled from a total of 12 sites. Collections were given temporary codes (#) during the expedition, and assigned BdRF collector codes and PI numbers later.

5. Deposit of records, germplasm and files:

US Potato Genebank, 4312 Hwy 42, Sturgeon Bay, WI, 54235. 920-743-5406. john.bamberg@ars.usda.gov. Query GRIN text "BdRF". Detailed trip log, GPS track and Waypoints files, and additional photos and miscellaneous notes available from JB at USPG.

6. Claimed USPG trip expenses:

JB=$1990, IB=$1500 (privately funded), AdR=$2293, CF=$1530, Total=$7050 direct costs not counting salary or non-travel-associated costs. We thank K. Williams of PEO for $7.5K funding.

7. Day by day Itinerary and Collections abstract:

All collections are *Solanum jamesii*. Lodging and restaurants mentioned are recommended. Places searched were pre-selected from study of GoogleEarth.

Sun17th: JB, IB and CF fly from GRB to MSP, meet AdR and continue to ABQ. Rent 4WD 2018 Jeep Grand Cherokee from *National*. Take 40 W to 117 E of Grants. Look at sites for at least 5 miles S on 117 as reported for herbspec Heil & Mietly [2008]. Lodge Grants Travelodge.

Mon18th: El Cafecito breakfast. Walmart for water and supplies. S on 53 to El Morro National Monument. Just E of campground outhouse observed less than 10 plants where many thousands were observed as BKPF 078 [1999]. Very dry. Back E on 53 to Ancient Ways Cafe. Met retiree Ms. Terry Savan who was fascinated with wild potato collecting story and gave contact info so she could be involved. **Collection #1**. Continue backtrack E to mile marker 67 pullout. Less then 10 small plants not collected. Continue back E on 53 to Zuni-Acona trailhead. Only one small cluster of J observed under single sprawling juniper N of outhouse by parking lot-- not collected. Back to Grants for lunch. W on 40 to 371 and N to Farmington. Meet Dr. Kevin Lombard of NM State University research farm where we have plots of all J collections in USPG growing (see photos p. 22). W to Shiprock and N to Cortez. Look at several places in loop W of Cortez defined by G-Airport road, Rt 21, road F. Habitat looked possible. D. Kinder informed us that he has seen J at ruin site along creek S of road G at N37.306789° x W108.650056°, but getting too dark to attempt hiking access. W on G = Airport = McElmo creek road and scouted several places, but access very limited. Looked possible, especially at the SE corner of road 21 and G where there are N-facing cliffs. Cortez supper at Gustavo Mexican, lodge Travelodge.

Tue19th: Pippa's breakfast 7AM, Spruce Tree coffee, reserve one more night at Travelodge. E to Mancos and S on 41 all the way to Ute border. No access except occasional E-W ravines. No access to

canyon delta up road 46. Stopped at place of "Rance" who gave permission to search his land extensively and welcomed us back any time. Knows Marilyn Colyer whom we contacted by email for advice after getting back to Wisconsin. Back up 41 to Mancos and lunch at Millwood restaurant. Back W on 160 and S on 36. Looked several places along creek bottoms. Looked possible. Back to E side of Cortez, looked at Denny Lake park. Back to W of Cortez and W along McElmo creek. No public land. Attempted to access Kinder site S of road G, but about half way to the creek, fence was posted Keep Out. Lodge Cortez Travelodge.

Wed20th: Checked out by 6:30 and to Pippa's for breakfast. To Mesa Verde National Park to meet acting natural resource director Tova Spector and associates (see photo p. 23). Hike down to Navajo Canyon, site of "mega-population" sampled as leaves for DNA in 2013 and described in AJPR 93:564. In contrast to the millions of plants observed carpeting the valley on Aug 28, 2013, only a few dozen small, brown, dried up plants could be found, some with tubers. Could invasive cheat grass be inhibiting? Note to follow up with testing that at USPG. Back to trailhead and lunch at Farview Terrace. E on 160 to Hesperus and S on 140 to Ft Lewis College and Fire Department picnic grounds. Looked good. N on 140 to Hay Gulch area. Back to 160 and Durango. N on 550 on W side of river and back down on E side of river, looking many places, including Oxbow park in city. Looked good, and elevation appropriate at about 6500 ft. Supper at Serious Texas BBQ, lodge Travelodge.

Thu21st: Check out at 7AM and Doughworks breakfast. E on 160 to Lower Piedra Campground on N on 168 N just before Piedra town (N37.242070° x W107.342569° and 6600 ft). Habitat looked very good. S on 151 to Capote Lake—very dry. To Pagosa Springs and dead end of San Juan street (N37.266713°x W107.005106° and 7100 ft.)—looked very good at moist, steep N-facing grade on S edge of river. Continue E on 160 to Klyde's Lake, but no access. To Del Norte and N on 112 and E on 374 to Dr. S. Thompson's former residence at (37.691643°x -106.337260° and 7880 ft). Found much look-alike nightshade (see photo p. 24). To La Veta and looked several accessible places along creek, especially in town, e.g., corner of Garland and Cherry streets along river. Habitat looked very good. Continue E and attempt to look at creek banks S on 351, but no access. To Lathrop State Park. Around campsites habitat looked very good. S on 25 to Trinidad, supper, lodge 8PM at Tower motel.

Fri22nd: River bottoms on 160 bypass (37.184102°x -104.489328° and 5960 ft.). Habitat looked good. W on 12 from Trinidad to Burro Canyon Road. Observe one small plant at exactly same place as previous collections BDM 052 [1996] and Bam 062 [1998]. Back E on 12 to Cokedale and N, looking at several promising sites. Purchase day pass for state park. S to Trinidad Lake, looking e.g., W side of Lake at (37.126919°x -104.620621° and 6250 ft.]. To E side of lake, across dam and along S shore to campsites. Habitat looked good. Trinidad lunch. S on 25 to Raton to site of Hartman 63639 [1998] with coordinates at exit 454 (not 455). Looked at both sides of interchange. On 72 E from Raton looking at several promising sites, particularly N of "Potato Mountain" at (36.936973°x -104.316190° and 7270 ft.). Moist black soil under gambel oak and mulch habitat looked very good. Back toward Raton but N on 526 to Lake Alice and Lake Maloya. Up Soda Pocket road where habitat looked good. Back to Raton and W on 555 York Canyon Road to Potato Canyon (36.900144°x -104.592445°) but no access. Everywhere along 555 gates are posted "No Trespassing for Any Purpose" by Vallejo Park Ranch. Tried to call phone number on sign, but no answer. Returned to 25 exit 454, this time looking NE of underpass on E side of 25 entrance ramp. **Collection #2**. Looked at NM/CO border exit, E side. K-Bob's Steakhouse for supper and Microtel lodge.

Sat23rd: Rain. Casa Lemus for breakfast and planning. Went back to 454 exit on 25 and N farther on 25. Very wide shoulder on E side of E lane made it possible to safely pull off and look in two valleys to E (with idea that these would be similar to collection #2 site). For example, at (36.947596°x -

104.470626°) habitat looked very good. Return to Raton and S on 25 to 64 E. To NRA Whittington Center, **Collection #3**. Down 64 to Dawson road W to look. Down 64 and N on road 1950. **Collection #4**. To Cimarron town and lunch at St. James hotel (highly recommended). Up 64 and N on road 204. **Collection #5**. Rain mostly stopped now. W on 64 to Cimarron pass. **Collection #6**. E on 58 to Springer and S on 25 to Wagon Mound then 120 NW to private road to Turkey Mountain. **Collection #7**. Down 25 to Las Vegas and lodge at Knights Inn.

Sun24th. Fog. Breakfast and S on 25. Exit 335 at Tecolote and up W frontage road, looking at several places. Continue on 25 SW and to Rowe exit, site of previous collections. Stopped several places to look on SW side of frontage road at several places where habitat looked good. Back to Rowe, looking many places on S frontage road to E. N on 63 toward Pecos stopped at Pecos National Historical Park and observed as few small plants under pines near visitor center. To Monastery Lake environs. Then N on 63 past Pecos to Lisboa Springs Fish Hatchery site previously collected, Bam 051 [1996], observing a few plants. To Glorieta. **Collection #8**. Santa Fe late lunch at Blue Corn Cafe and Brewery and to Albuquerque to lodge at Sleep Inn near airport.

Mon25th. Breakfast and planning for this last day. Since coming back to ABQ tonight, CF stayed to organize and pack plants and tubers while others drive down to Datil site of Hiler 14 [1921] reported as *fendleri*. S on 25 to Socorro, then W to Datil on 60. **Collection #9**. Lunch at Eagle Guest Ranch Cafe and back E on 60 to new picnic pulloff site on S side of road. **Collection #10**. Back E on 60 to previous collection site at N picnic pulloff known to be extremely variable in presentation of plants, and have particularly large tubers. **Collection #11**. Back to ABQ and E on 40 to 217 and S to herbspec site we mistakenly called "Hartman" although really associated with herbspec of M.A. Tafoya [1977]. **Collection #12**.

Tue26th. Return to Wisconsin.

Tables. List of materials collected and narratives

Full narratives with location coordinates, habitat and plant descriptions, collection details and disposition are available in GRIN by query on individual PI number or the "BdRF" collector prefix. Also access GRIN for updates and eventual evaluation data on these stocks.

Temp coll Place	Temp coll #CODE	Temp coll sp. Suffix	Sept 2017 date	BdRF	PI	site origin	plants	tubers	fruits	seeds
Ancient Ways	1	J	18	348		new	5	10	4	114
Raton 454	2	J	22	349		herb		48		
NRA	3	J	23	350		new	13	22		
FR 1950	4	J	23	351		new	1			
FR 204	5	J	23	352		new		21		
Cimarron 64W	6	J	23	353		new		26		
Turkey Mts.	7	J	23	354		new	7	8		
Glorieta	8	J	24	355		new		218	11	85
Datil	9	J	25	356		herb		52		
Magdalena S	10	J	25	357		new		27	11	380
Magdalena orig	11	J	25	358		re-coll			25	580
Hartman	12	J	25	359		herb		33		

Site: Found by herbspec record, known as re-collection, or new scouted *de novo* by habitat.

Provenance narratives

PI 686439. BdRF 348. S. jamesii. United States. New Mexico. Cibola County. Near El Morro. From Grants S and W on 53 to about one mile E of El Morro National Monument entrance at Ancient Ways restaurant and campgrounds. Around parking area and driveway within 100 ft of 53, most on S side. At WSG 35.044234° x -108.319827° and 7300 ft. Coll #1. September 18, 2017. A few scattered clusters of plants to 8 inches. Some green, some more mature and occasional mature fruit. Under juniper and brush and in open. Dry brown sandy soil. Collected 5 plants, 10 tubers, 4 fruit with 114 seeds.

PI 686440. BdRF 349. S. jamesii. United States. New Mexico. Colfax County. Near Raton. N of Raton on 25 at interchange 454. NW facing road cut on 25N on-ramp. Approximate site of herbspec Hartman 63639 [1998]. At WSG 36.919794° x -104.447643° and 6834 ft. Coll #2. September 22, 2017. Several colonies of 60-80 plants, usually less than 8 inches, often spindly and yellow without flowers or fruit. In rocky ravines and steep NW-facing slopes in rocky, medium brown soil, under brush, grass, sage and pines. Collected 48 tubers.

PI 686441. BdRF 350. S. jamesii. United States. New Mexico. Colfax County. Near Raton. From Raton S on 25 and SW on 64 about 4 miles to NRA driveway to NW. W from NRA gate on Main road and Fundraising road to Van Houten canyon, bottoms SW of Willow Creek. At WSG 36.784986° x -104.546116° and 6580 ft. Coll #3. September 23, 2017. Hundreds of plants of all sizes, many very large and green. Some flowers. Some grazed with thick stem stubs remaining. Tubers at end of long stolons. No fruit. Under large junipers and in open grass in flat creek bottom. Very dark, rich soil. Collected 13 plants, 22 tubers.

PI 686442. BdRF 351. S. jamesii. United States. New Mexico. Colfax County. Near Cimarron. Cimarron town NE about 5 miles on 64 and about 3 miles NW on FR1950 up canyon along Cerrososo creek. W side of road across from a big rock on E edge of road. At WSG 36.576877° x -104.854976° and 6510 ft. Coll #4. September 23, 2017. Single 6 inch slightly yellowed plant. Mostly open roadside among rocks and brush. Brown soil. Collected 1 plant.

PI 686443. BdRF 352. S. jamesii. United States. New Mexico. Colfax County. Near Cimarron. Cimarron town NE about one mile on 64 and NW on FR204 between mile markers 4 and 5 up canyon along Point Creek in Dean Canyon. Within 30 ft of both S and N roadsides. At WSG 36.574968° x -104.947780° and 6680 ft. Coll #5. September 23, 2017. About 30 plants, yellowed to 8 inches. No flowers or fruit. Under junipers and pines. Dry sawdust-like duff. Collected 21 tubers.

PI 686444. BdRF 353. S. jamesii. United States. New Mexico. Colfax County. Near Cimarron. From Cimarron W on 64 about 4 miles. On S side of 64 within gravel loop of roadside pulloff. At WSG 36.522621° x -104.988591° and 6660 ft. Coll #6. September 23, 2017. Many scattered plants of all sizes. Some green but many yellowed. No flowers or fruit. Most under shade of trees among grass and herbs. In pure needle mulch or hard, very black soil. Collected 26 tubers.

PI 686445. BdRF 354. S. jamesii. United States. New Mexico. Mora County. Near Wagon Mound. From Wagon Mound W on 120 about two miles to private road and about 6 miles to Turkey Mt. (private land). About 250 ft SW of residence under W-facing cliffs to E of road. At WSG 36.008630° x -104.828910° and 6450 ft. Coll #7. September 23, 2017. To 10 inches. Most green with some yellowed. About 50 plants. No flowers or fruit but some with mature tubers. Oak scrub and pines. Dark, moist, black soil. Among rocks and dry grass along base of cliff. Collected 7 plants, 8 tubers.

PI 686446. BdRF 355. S. jamesii. United States. New Mexico. Santa Fe County. Santa Fe National Forest. Near Glorieta. N of 25 hairpin at Glorieta. At private gated Baptist camp and retreat center, only open to public visitors on weekends. N through complex to Ruiz canyon along Apple and Holly roads. Also a few plants along E edge of Oak road at street number 150. At WSG 35.598104° x -105.769187° and 7510 ft. Coll #8. September 24, 2017. Thousands of plants to 18 inches tall. Most very green. Occasional fruit, many tubers. Under shade of oaks along ravine, in dead grass thatch, very black, moist soil. Collected 218 tubers, 11 fruit with 85 seeds.

PI 686447. BdRF 356. S. jamesii. United States. New Mexico. Catron County. Cibola National Forest. Near Datil. NW from Datil on 60 about 3.7 miles to dirt road to NE to "Baldwin Station" corrals. Site of Hiler 14 [1921] reported as S. fendleri. At WSG 34.182037° x -107.879381° and 7500 ft. Coll #9. September 25, 2017. About 300 plants to 4 inches, completely dead, dry, shriveled and copper brown. No fruit. Typically a single mature tuber under each plant. Completely unshaded in hard, very dry, brown soil. Common under corral fence. Collected 52 tubers.

PI 686448. BdRF 357. S. jamesii. United States. New Mexico. Socorro County. Cibola National Forest. Near Magdalena. From Magdalena about 12.5 miles W on 60. Scattered around roadside picnic area S side of highway. At WSG 34.077218° x -107.462024° and 7150 ft. Coll #10. September 25, 2017. About 50 plants to 8 inches, many completely dry, shriveled and copper brown. Sometimes a single, large, mature fruit. Sometimes a single mature tuber. In open or under trees and brush. In very dry, brown, sandy soil or under needle duff. Some at edge of cement picnic table pad. Collected 27 tubers, 11 fruit with 380 seeds.

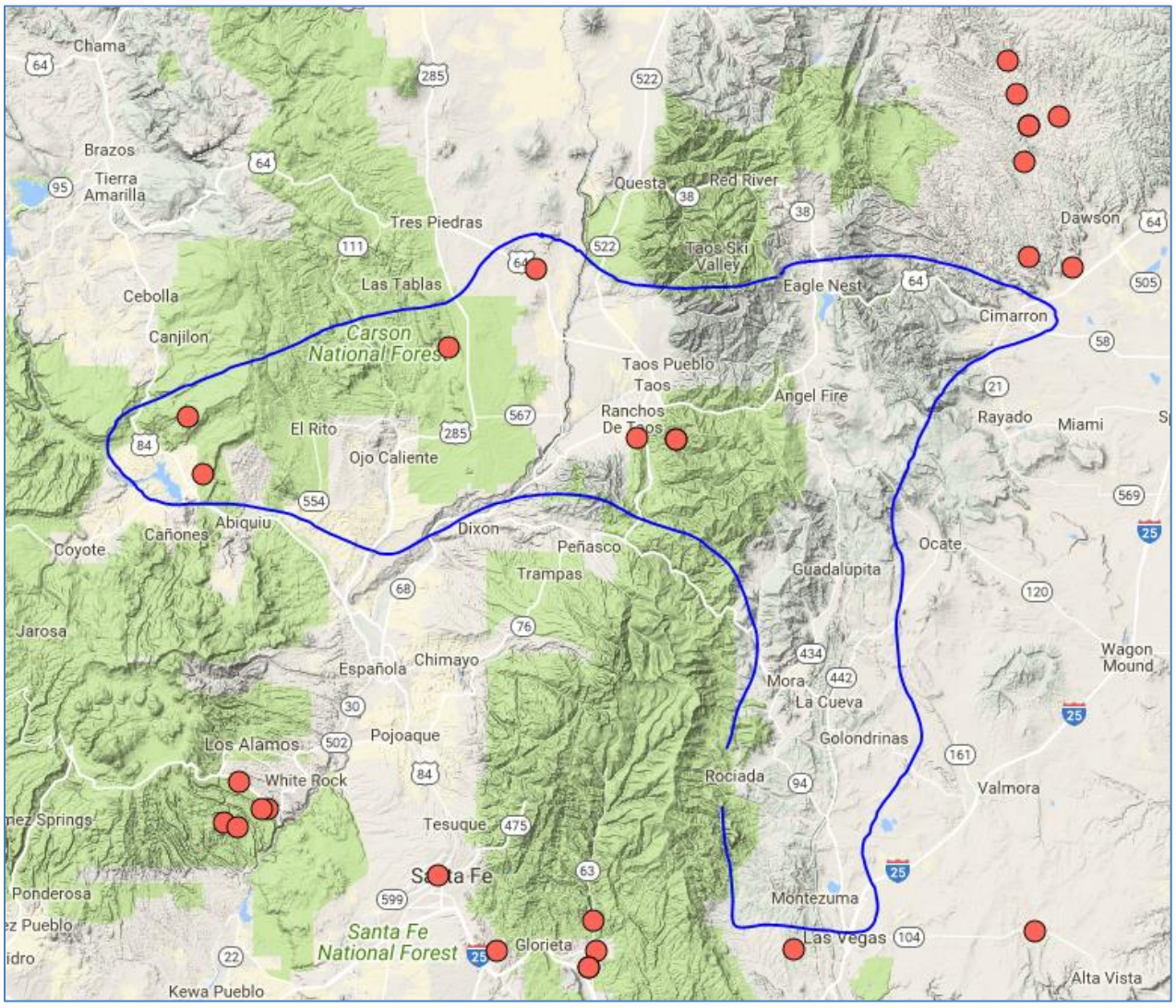
PI 686449. BdRF 358. S. jamesii. United States. New Mexico. Socorro County. Cibola National Forest. Near Magdalena. From Magdalena about 12 miles W on 60. Roadside picnic area N side of highway. At WSG 34.076156° x -107.453399° and 7160 ft. Coll #11. September 25, 2017. Dozens of plants to 8 inches, most completely dry, shriveled and copper brown. Sometimes a single, large, mature fruit. Sometimes a single mature tuber. Open, very dry, sandy brown soil. Often at edge of cement picnic table pad where presumably there was more moisture than in open. Collected 25 fruit with 580 seeds.

PI 686450. BdRF 359. S. jamesii. United States. New Mexico. Bernalillo County. Near Sedillo. E from Albuquerque on 40 about 25 miles, then frontage road 66 E and S on 217 about 2 miles and W on Dove Valley road. At NE corner of dead end of Dove Valley road and private drive. Most within 30 ft of E edge of private road to N. Site of herbspec M.A. Tafoya [1977]. At WSG 35.063407° x -106.267720° and 6950 ft. Coll #12. September 25, 2017. About 100 plants to 6 inches, completely dead, dry and copper brown. No fruit. Commonly a single mature tuber under each plant. In open dry brown sandy soil and among dead grass or under junipers. Collected 33 tubers.

8. Additional and more intensive future exploration possibilities in this area

We did not take time to explore site Riffle 780 [1968] below Salitre Mesa on 612 below Prewitt on 40 W of Albuquerque. We did not divert S to look for more collections near our previous site near Navajo Reservoir by Arboles town, reported as herbspecs from the lakeshore, Heil 20172 [2002] and Heil 19863 [2002] . The days in southern Colorado were unproductive. Then we began to find several good populations in the valleys between Raton and Cimarron, but this is only about 40 miles along the eastern foothills. We did not have enough days remaining in the trip to fully explore the additional ~60 miles of foothill valleys between Cimarron and Las Vegas. And there are reported herbspec sites in Carson National Forest near Taos found after our early searching in the area, and from which we have no germplasm (loop in map below). This area would be a good follow-up target area for a future expedition, since we have no living germplasm from within this loop except the 2017 collection near Cimarron.

Area that needs more exploration



9. Permit

Thu 8/10/2017 1:05 PM

Cummings, Dave -FS

Potato Genetic Collection in the Southwest Region

To Bamberg, John

Cc Kennedy, Kathryn L -FS; Hargrave, Ashton L -FS

Hi John, Use this message as your collection authorization.

John Bamberg and his associated researchers from the USDA/ARS - U. S. Potato Genebank are allowed to collect wild potatoes on National Forest lands within the Southwest Region as a "within-USDA" cooperating agents.

If you have any additional questions you may contact Katheryn Kennedy, Regional Botanist p: 505-842-3263 ; c: 314-302-3760: kathrynlkennedy@fs.fed.us or Dave Cummings, Forest Officer; p: 505-842-3888 c: 505-842-3426; dcummings@fs.fed.us

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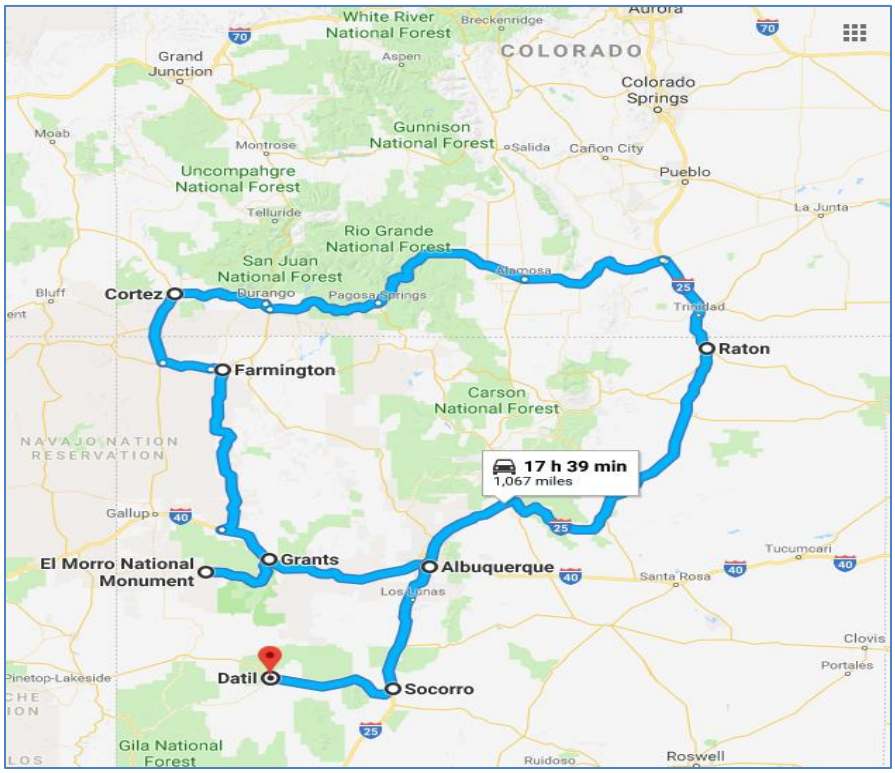
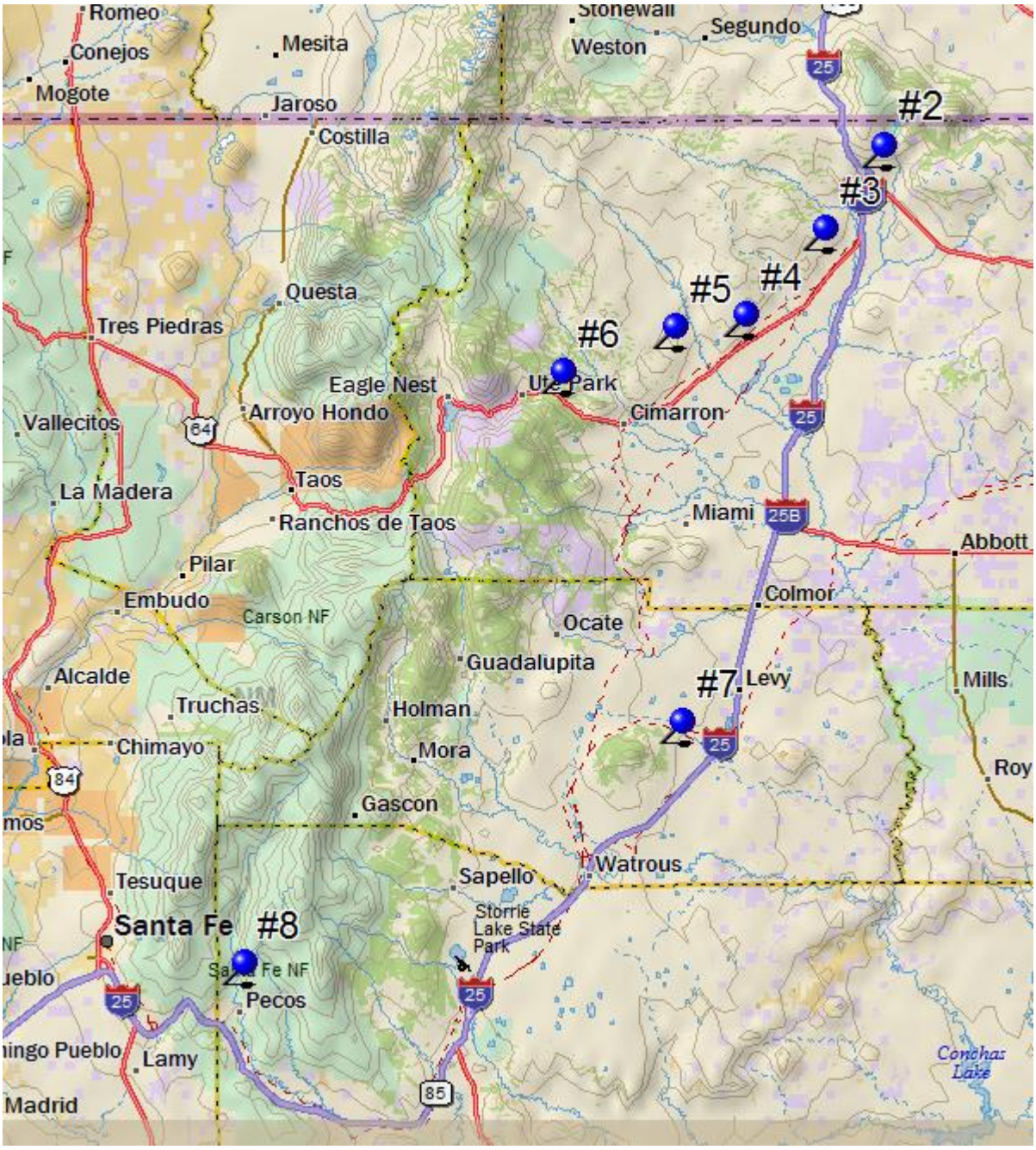
10. Photos and maps of locations, habitats, and plants

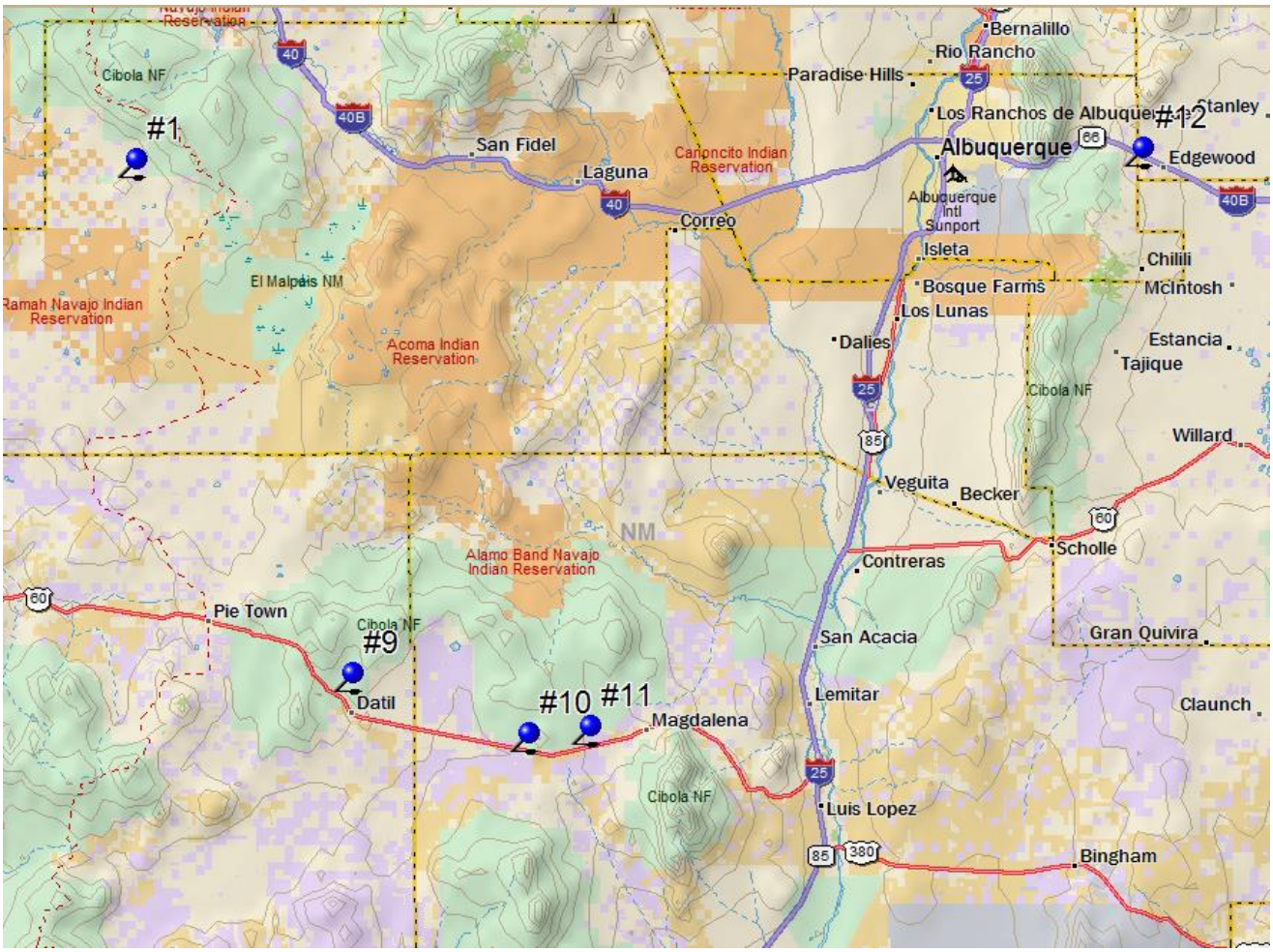
General area and driving loop from Albuquerque clockwise



Sites of collections #2 - #8.

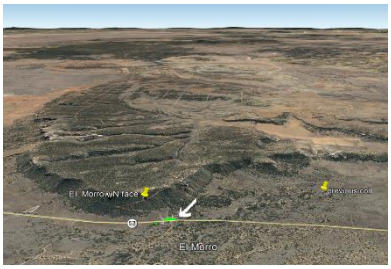


Sites of collections #1, #9 - #12



Collection site visuals

Ancient Ways Cafe #1 (red roof) area new El Morro. Looking south across 53. In the shadow of El Morro mesa (as shown in lower right picture). Open grassy area around buildings and under junipers.

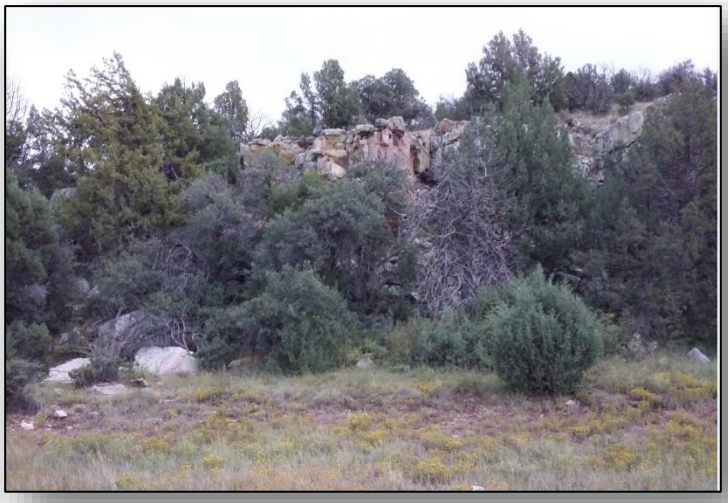


Site of #2 Raton 454 exit. E of on-ramp when intending to head N on 25. This aspect is looking S toward Raton.
As below, on slope above guardrail, mostly N-facing. This is Hartman 63639 [1998] site.

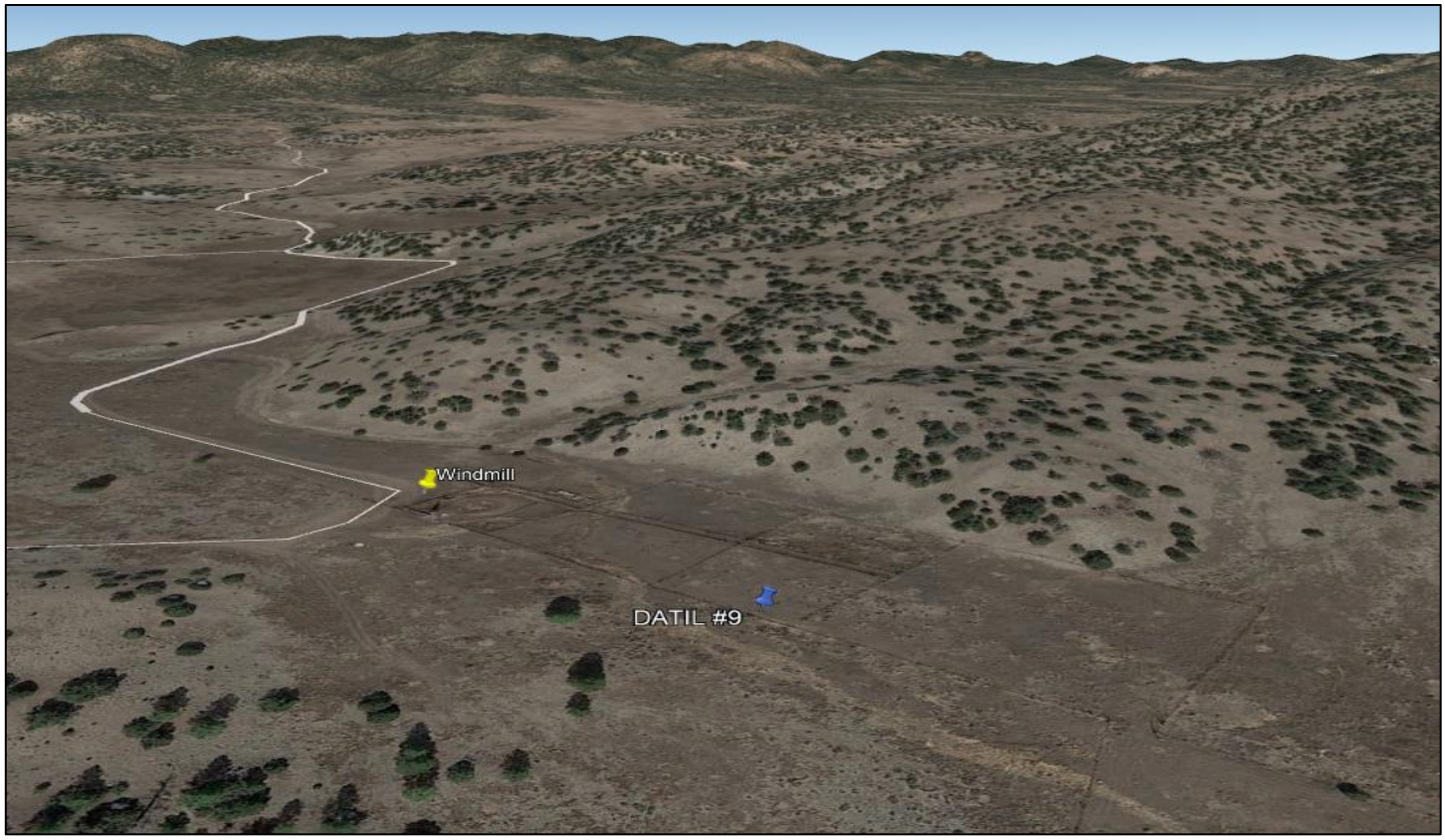
NRA #3 site. Above: looking N toward Raton. Below left: N side of road between slope and creek (view facing W). Below right: JB and IB digging tubers of large green plants in open grass.

Collections FR 1950 #4, FR 204 #5, and Cimarron 64W #6. Below: Cimarron 64W #6. Abundant under many trees within the roadside pulloff loop on S side of 64. Looking W here. FR 1950 is close to Legler 11219 [2008] site.

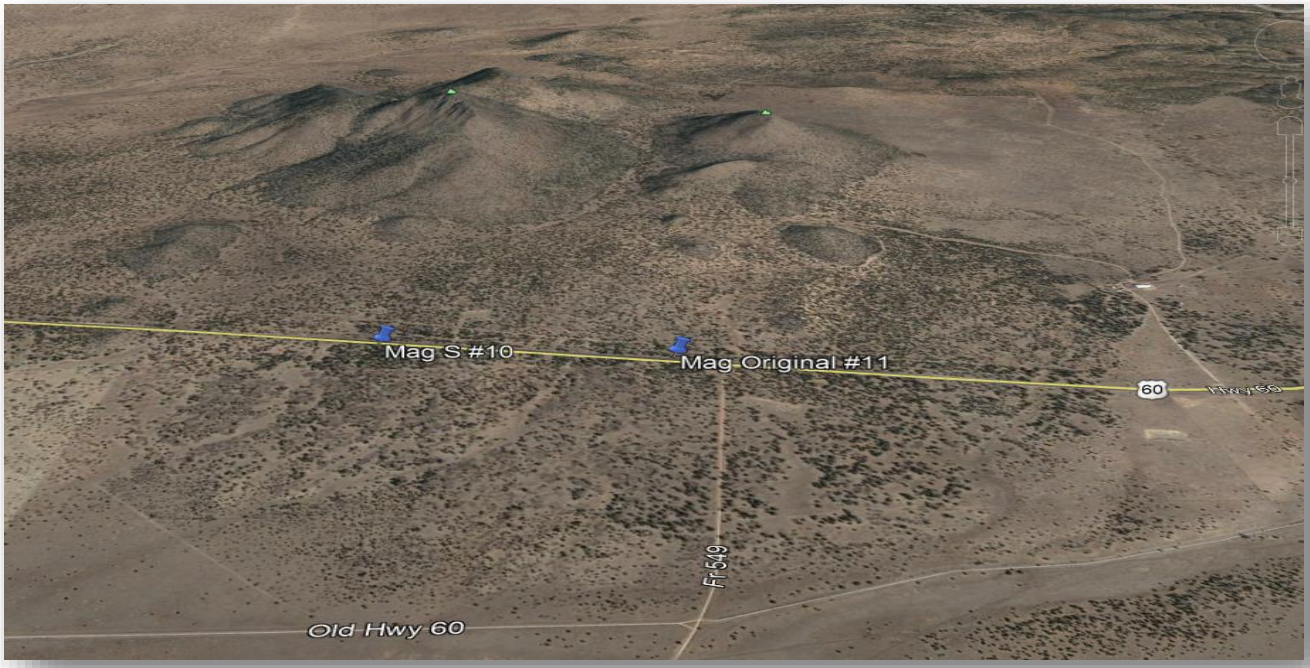
Turkey Mtns. #7 Above: Looking east. Below left: W of town of Wagon Mound, here looking N. Below right: Habitat in brush and rocks below NW-facing cliffs.



Glorieta #8 site. Above: Facing north, along Holly and Apple roads in Glorieta Baptist Camp going up Ruiz canyon. Below left: CF digging tubers from roadside plants (facing north). Below right: IB shown among very many large green plants in grass thatch in moist black soil under shade of trees.

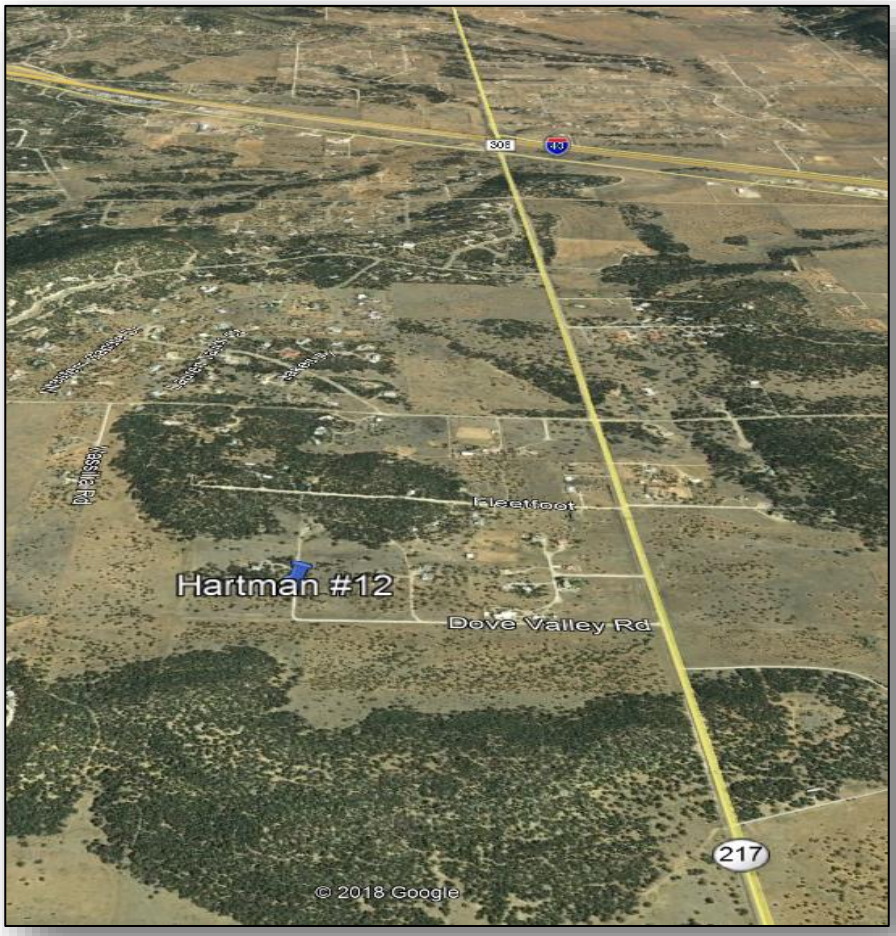


Datil #9 site. Small dead plants all around corral (note the faint rectangular outline of fences). Note wooden windmill in SW corner by the dirt road (and below right). This is less than ½ mile N on a dirt road off 60, the turnoff being 3.6 miles W on 60 from the 12 intersection in Datil. Site of Hiler 14 [1921] reported as *fendleri*.



Magdalena S #10 (roadside picnic pulloff on south side of 60) and Magdalena original #11 (roadside picnic pulloff on N side of 60). Both just S of Tres Montosas which is 12 miles W of Magdalena town on 60. Note large mature purple fruit. Most plants were completely dried up, reddish-brown in very dry soil.

Hartman #12 site. Inside corner of Dove Valley road W of 217 and S of 40 about 20 miles E of Albuquerque. Hundreds of reddish-brown dead plants up to 4 inches, sometimes under junipers or in open sand among clumps of dead grass. Small, mature tubers common. Recorded as "Hartman" but this site is really associated with the herbspec of M.A. Tafoya [1977].



OTHER PHOTOS

All *jamesii* accessions were planted at this NMSU farm plot near Farmington in August. CF and AdR observe robust, flowering plants with bees working, making abundant fruit. Mature tubers harvested in November.

Navajo Canyon in MEVE, site of 2012 *jamesii* MegaPopulation. Four rangers (J. Smith, G. Stewart, D. Spear, T. Spector) accompany us, finding only a few small patches of dried up plants.

At Del Norte, CO, at former home of Dr. S. Thompson (potato breeder for NDSU). Fairly abundant form of *Solanum americanum* that looks very much like *Solanum jamesii*.

In many places on this trip, like shown here with IB on road 555 W of Raton in York/Potato Canyon, we could not get to likely habitats because access to private land was completely fenced and sternly posted. This was also true around Cortez/Mesa Verde.

CF carrying home live plant collections (see Table)