

EXPLORATION AND COLLECTION OF RARE *Helianthus* SPECIES FROM SOUTHEASTERN UNITED STATES

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SUMMARY

A 10-day trip, encompassing 4600 km in the southeastern USA states of Tennessee, North Carolina, South Carolina, Georgia and Alabama, was made in October, 2003. Our primary objective was to locate populations of *Helianthus eggertii*, then on the USDI, Fish and Wildlife Service Threatened and Endangered Species list, and *H. verticillatus*, a candidate for endangered species status. *Helianthus eggertii* has since been de-listed (August 2005). An additional objective was to collect seeds of *H. porteri*, a species reclassified from *Viguiera porteri*, which is endemic to granite rock outcrops in Georgia. We collected seeds from 27 populations of the above three species plus three additional species, *H. angustifolius*, *H. atrorubens*, and *H. smithii*. Seed was deposited with the USDA-ARS North Central Regional Plant Introduction Station at Ames, Iowa (NCRPIS) from which 24 of the 27 collections are available for distribution. The three 'target' species were represented by 13 collections of *H. eggertii*, eight of *H. porteri*, and two of *H. verticillatus*; none of the three species were previously available from the NCRPIS sunflower collection. The availability of seed of these three species will allow researchers around the world the opportunity to investigate the potential of these wild *Helianthus* species to contribute useful traits to cultivated sunflower. Complete collection data has been loaded into the USDA-ARS Germplasm Resource Information Network (GRIN), and is available on the internet (www.ars-grin.gov).

Key words: sunflower, wild *Helianthus* species, germplasm collection, *H. eggertii*, *H. verticillatus*, *H. porteri*, southeastern USA states

INTRODUCTION

The USDA-ARS wild *Helianthus* germplasm collection, housed in the USDA-ARS North Central Regional Plant Introduction Station (NCRPIS) in Ames, Iowa, currently manages 2022 accessions of wild *Helianthus* species, of which 1584 are

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available for distribution. Of 23 annual and 43 perennial *Helianthus* taxa, four are not currently represented in the collection [*H. niveus* ssp. *niveus*, *H. laciniatus*, *H. multiflorus*, and *H. nuttallii* ssp. *parishii*]. Six taxa have only one or two accessions and six taxa have no accessions with distributable seed (Table 1). Of the four taxa without representation in the NCRPIS collection, one is likely extinct (*H. nuttallii* ssp. *parishii*) and one, endemic to Pacific coast regions of Baja California, Mexico (*H. niveus* ssp. *niveus*) is unobtainable at this time due to international germplasm issues. The USDA-ARS Sunflower Unit in Fargo, North Dakota, has recently increased its efforts to collect seed of these underrepresented species by conducting annual exploration trips to various parts of the US.

The objective of this trip to five southeastern states (Tennessee, North Carolina, South Carolina, Georgia and Alabama) was to collect seeds of three rare *Helianthus* species. *Helianthus eggertii* is a perennial species found only in Tennessee (15 counties), Kentucky (9 counties) and Alabama (3 counties) in barren forest openings, typically created by fire (Jones, 1994). This species had only two accessions in the NCRPIS seedbank, neither of which was available for distribution. *H. eggertii* was listed as an endangered species by the USDA, Fish and Wildlife Service (USFWS) from 1997 until August 2005 when it was de-listed (White and Ratzlaff, 1999). The USFWS shared site information for over 200 populations with our unit. *Helianthus porteri* (commonly known as the 'Confederate daisy'), reclassified from the genus *Viguiera* (Pruski, 1998) is confined to barren, granite outcrops such as Stone Mountain, GA. The distribution of these granite outcrops is limited to the Piedmont region of Georgia, South Carolina and North Carolina. There were no accessions of this species in any USDA-ARS germplasm collection. *Helianthus verticillatus* was first collected in Tennessee in 1892 (Small, 1898) and was not observed again until 1994 (Matthews *et al.*, 2002). It is currently known from fewer than ten populations in northwestern Georgia, northeastern Alabama and western Tennessee. *Helianthus verticillatus* is a low priority candidate for federal protection, and there were no accessions in the USDA-ARS seed collection prior to this collection trip. In addition to the above species of high collection priority, this area of the US was within the range of at least 27 other *Helianthus* taxa (Rogers *et al.*, 1982; Weakley, 2006), making the region extremely rich in species diversity.

MATERIALS AND METHODS

Since two of the target species (*H. eggertii* and *H. verticillatus*) are currently being monitored by state and federal agencies, there are reports documenting sites of current populations for these three species. Thus, for *H. eggertii*, there are 128 populations monitored by the USFWS and the Tennessee Natural Heritage Program (White & Ratzlaff, 1999), as well as several dozen sites on the Arnold Air Force Base (central TN), monitored by the US Air Force and contract botanists. *Helianthus verticillatus* populations are being monitored by the Alabama and Georgia Natural

Table 1: Wild *Helianthus* species seed availability in the USDA-ARS NCR Plant Introduction collection as of December, 2006.

Annual Species	Total	Avail	Perennial Species	Total	Avail
<i>H. annuus</i>	874	850	<i>H. angustifolius</i>	19	6
<i>H. agrestis</i>	5	0	<i>H. arizonensis</i>	2	0
<i>H. anomalus</i>	8	4	<i>H. atrorubens</i>	14	8
<i>H. argophyllus</i>	46	20	<i>H. californicus</i>	21	18
<i>H. bolanderi</i>	8	6	<i>H. carnosus</i>	3	0
<i>H. debilis</i> ssp. <i>cucumerifolius</i>	7	7	<i>H. ciliaris</i>	6	2
<i>H. debilis</i> ssp. <i>debilis</i>	13	12	<i>H. cusickii</i>	21	12
<i>H. debilis</i> ssp. <i>silvestris</i>	22	22	<i>H. decapetalus</i>	31	21
<i>H. debilis</i> ssp. <i>tardiflorus</i>	5	5	<i>H. divaricatus</i>	33	9
<i>H. debilis</i> ssp. <i>vestitus</i>	3	3	<i>H. eggertii</i>	15	10
<i>H. exilis</i>	28	20	<i>H. floridanus</i>	4	2
<i>H. deserticola</i>	22	15	<i>H. giganteus</i>	29	15
<i>H. neglectus</i>	28	28	<i>H. glaucophyllus</i>	1	0
<i>H. niveus</i> ssp. <i>canescens</i>	19	13	<i>H. gracilentus</i>	7	5
<i>H. niveus</i> ssp. <i>niveus</i>	0	0	<i>H. grosseserratus</i>	44	39
<i>H. niveus</i> ssp. <i>tephrodes</i>	12	6	<i>H. heterophyllus</i>	8	0
<i>H. paradoxus</i>	10	0	<i>H. hirsutus</i>	18	5
<i>H. petiolaris</i> ssp. <i>fallax</i>	35	35	<i>H. laciniatus</i>	0	0
<i>H. petiolaris</i> ssp. <i>petiolaris</i>	102	100	<i>H. laetiflorus</i>	7	2
<i>H. porteri</i>	8	8	<i>H. laevigatus</i>	6	2
<i>H. praecox</i> ssp. <i>hirtus</i>	7	7	<i>H. longifolius</i>	2	2
<i>H. praecox</i> ssp. <i>praecox</i>	9	9	<i>H. maximiliani</i>	65	53
<i>H. praecox</i> ssp. <i>runyonii</i>	25	25	<i>H. microcephalus</i>	11	4
			<i>H. mollis</i>	26	11
			<i>H. multiflorus</i>	0	0
			<i>H. nuttallii</i> ssp. <i>nuttallii</i>	26	23
			<i>H. nuttallii</i> ssp. <i>parishii</i>	0	0
			<i>H. nuttallii</i> ssp. <i>rydbergii</i>	16	16
			<i>H. occidentalis</i> ssp. <i>occidentalis</i>	1	1
			<i>H. occidentalis</i> ssp. <i>plantagineus</i>	11	8
			<i>H. pauciflorus</i> ssp. <i>pauciflorus</i>	8	5
			<i>H. pauciflorus</i> ssp. <i>subrhomboides</i>	16	11
			<i>H. pumilus</i>	51	44
			<i>H. radula</i>	16	3
			<i>H. resinosus</i>	18	5
			<i>H. salicifolius</i>	1	0
			<i>H. silphioides</i>	2	1
			<i>H. simulans</i>	3	2
			<i>H. smithii</i>	6	4
			<i>H. strumosus</i>	34	15
			<i>H. tuberosus</i>	107	22
			<i>H. verticillatus</i>	2	2

Heritage Program. Several of the larger populations occur within a conservation easement donated by the Temple-Inland Timber Corporation to the Nature Conservancy. *Helianthus porteri* is endemic to granite outcrops in the Piedmont area of northern Georgia, with lesser occurrences in northern Alabama and South Carolina (McVaugh, 1943). The Georgia Natural Heritage Program, which graciously supplied us with site location information, monitors the species.

Since the above three *Helianthus* species have been extensively monitored by several state and federal agencies, there was a considerable amount of information available about their specific occurrences, despite the fact that populations of each species are limited. In addition to utilizing these data, we also relied heavily upon the expertise and personal involvement of several local botanists, who are listed in the acknowledgements. Once a *Helianthus* population was physically located, the GPS coordinates were determined with a Garmin III Plus GPS receiver and the site marked on a computer-based topographic map (iGage "All Topo"). Seed was collected from as many mature heads and plants as possible, and information on site habitat, plant morphology, and phenology recorded. Digital photographs were taken at all sites, as well as a pressed plant specimen for the USDA-ARS Sunflower Unit herbarium in Fargo, ND. More detailed description of preparations and conduct of these collecting trips have been published (Seiler and Gulya, 2004).

Seeds were processed and inventoried by personnel at the USDA-ARS NCRPIS (Ames, IA) and information entered into the National Plant Germplasm System (NPGS) Germplasm Resources Information Network (GRIN) database. Thus, complete information on all collections, including collection site and evaluation data, are available through the GRIN database (http://www.ars-grin.gov/cgi-bin/npgs/html/tax_search.pl?Helianthus). The collection site map (Figure 1) was created using Arc-GIS 9.0 software (ESRI 2004).

RESULTS AND DISCUSSION

A total of 27 populations of the three target species, plus three other *Helianthus* species, were located and seeds collected during the October, 2003 trip (Table 2). Seeds were collected from 13 populations of *H. eggertii* in AL, SC and TN, eight populations of *H. porteri* in GA and NC, two populations of *H. verticillatus* in TN and AL, plus two populations of *H. angustifolius* (GA and TN) and one each of *H. atrorubens* (AL) and *H. smithii* (NC) (Figure 1).

Helianthus eggertii is a perennial, rhizatomous, hexaploid species found primarily in forest openings in central Tennessee, central Kentucky, and northern Alabama (Figure 2). The species is tall (up to 2.5 m), has distinctive purple, glabrous, waxy stems, nearly sessile single-veined leaves, and blooms from early August through mid-September (Rogers *et al.*, 1982; Schilling, 2006). We made 13 collections of *H. eggertii* primarily from TN (10), with five of those collected on the grounds of the Arnold Engineering Development Center (AEDC) in central TN. This

Table 2: Site information for 27 collections of six *Helianthus* species made in October, 2003.

Site #	Ames #	Species	GPS - N	GPS - W	Alt (m)	State	County	Number of Plants	100 Seed Weight	Seed Available for Distribution	
2399	27672	<i>H. angustifolius</i>	35.39925	-86.01509	325	TN	Coffee	200	0.08	Yes	
2424	27673	<i>H. angustifolius</i>	33.75904	-84.85452	305	GA	Douglas	150	0.10	Yes	
2426	27674	<i>H. atrorubens</i>	33.89058	-86.82572	213	AL	Blount	15	0.22	Yes	
2388	27675	<i>H. eggertii</i>	36.41246	-86.84747	265	TN	Robertson	100	0.63	No	
2389	27676	<i>H. eggertii</i>	36.41708	-86.93526	232	TN	Robertson	300	0.78	Yes	
2390	27677	<i>H. eggertii</i>	35.89617	-87.13014	296	TN	Williamson	450	0.75	Yes	
2392	27678	<i>H. eggertii</i>	35.36059	-87.56157	314	TN	Lawrence	1000	0.95	Yes	
2393	27679	<i>H. eggertii</i>	35.15432	-87.18670	293	TN	Giles	1000	0.67	Yes	
2394	27680	<i>H. eggertii</i>	35.40292	-86.08223	335	TN	Coffee	1700	0.65	No	
2395	27681	<i>H. eggertii</i>	35.38691	-86.09233	326	TN	Coffee	1300	0.79	No	
2396	27682	<i>H. eggertii</i>	35.36152	-86.16098	320	TN	Coffee	1600	0.93	Yes	
2397	27683	<i>H. eggertii</i>	35.35899	-86.17824	326	TN	Franklin	6000	0.69	Yes	
2398	27684	<i>H. eggertii</i>	35.35596	-86.13638	323	TN	Coffee	1700	0.72	Yes	
2413	27685	<i>H. eggertii</i>	34.89793	-81.01105	183	SC	York	100	0.49	Yes	
2427	27686	<i>H. eggertii</i>	33.88381	-86.84478	201	AL	Blount	200	0.79	Yes	
2428	27687	<i>H. eggertii</i>	34.33025	-87.67027	314	AL	Franklin	1000	0.87	Yes	
Average for <i>Helianthus eggertii</i>											
2401	27688	<i>H. porteri</i>	35.96370	-81.11849	407	NC	Alexander	2000	0.15	Yes	
2417	27689	<i>H. porteri</i>	33.75155	-83.83260	274	GA	Walton	1000	0.17	Yes	
2418	27690	<i>H. porteri</i>	33.70145	-83.97935	229	GA	Rockdale	500	0.17	Yes	
2419	27691	<i>H. porteri</i>	33.70852	-84.09322	293	GA	DeKalb	2000	0.16	Yes	
2420	27692	<i>H. porteri</i>	33.34485	-83.96137	223	GA	Butts	1000	0.13	Yes	
2421	27693	<i>H. porteri</i>	33.14737	-84.46487	268	GA	Pike	1000	0.16	Yes	
2422	27694	<i>H. porteri</i>	32.98743	-84.65955	268	GA	Meriwether	1000	0.15	Yes	
2423	27695	<i>H. porteri</i>	33.41266	-84.98012	302	GA	Coweta	500	0.14	Yes	
Average for <i>Helianthus porteri</i>											
2400	27696	<i>H. smithii</i>	35.64997	-81.57299	390	NC	Burke	100	0.34	Yes	
2391	27697	<i>H. verticillatus</i>	35.48489	-88.71247	134	TN	Madison	200	0.27	Yes	
2425	27698	<i>H. verticillatus</i>	34.12869	-85.46075	183	AL	Cherokee	75	0.23	Yes	
Average for <i>Helianthus verticillatus</i>											
									138	0.25	

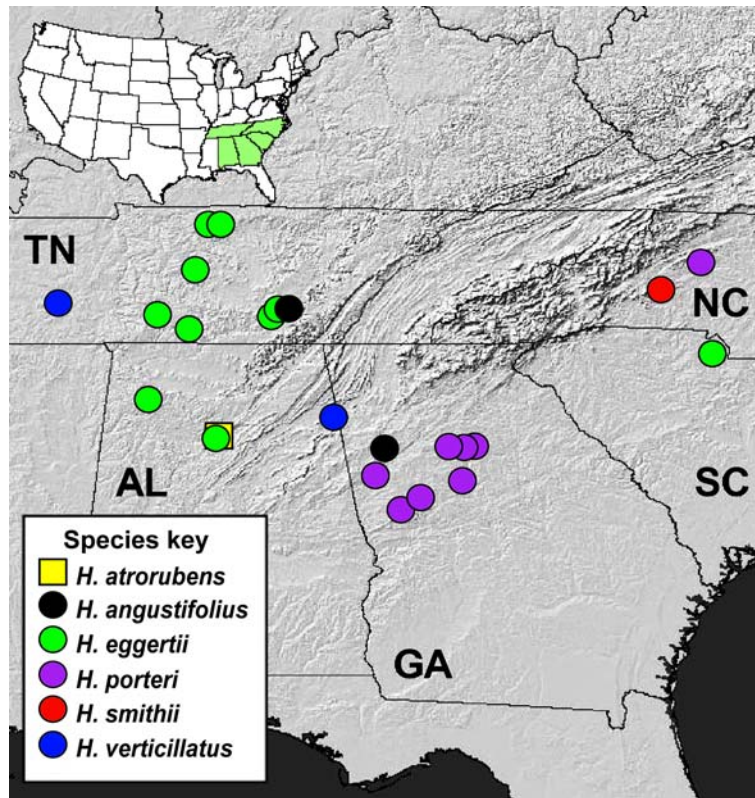


Figure 1: Location of 27 sites in southeastern United States where collections of six *Helianthus* species (*H. angustifolius*, *H. atrorubens*, *H. eggertii*, *H. porteri*, *H. smithii*, and *H. verticillatus*) were made during the October, 2003 trip. (Map created using Arc-GIS 9.0 software (ESRI 2004). Copyright © 2004 ESRI, data layers from ESRI and USGS. All rights reserved.)



Figure 2: Gary Kong harvesting seed heads of *Helianthus eggertii* in a typical forest clearing habitat of central Tennessee. Note purple stems and top branching. Flower head, with purple stems (lower left), mature heads (lower right) and leaf underside (upper right) with orange pustules of *Coleosporium helianthi* rust.

latter site is owned by the US Air Force and the *H. eggertii* sites are managed by prescribed burns by base personnel. The other collections were from AL (2) and SC (1). Population sizes varied from ~100 plants to several thousand (as documented by AEDC surveys). The 13 collections span a significant portion of the geographic distribution of *H. eggertii* and presumably capture a wide genetic diversity. Enough seed was collected to make nine of the 13 available for distribution (Table 2). *Helianthus eggertii* is also reported in at least 11 counties of Kentucky, but no sites in KY were visited during this trip. *Helianthus eggertii* seeds were the largest of any species collected during the trip, averaging 0.75 g/100 seeds. Seeds of all the other collected species averaged 0.26 g/100 seeds or less.



Figure 3: Typical granite rock outcrop site for *Helianthus porteri* in northern Georgia, showing “islands” of vegetation in shallow depressions. Upper right insert shows conical form of mature seed heads, and lower right insert shows flower in bloom, with notched ray petals.

Figure 4: *Helianthus verticillatus*, in western Tennessee, showing tall nature (~4 meters) of mature plant relative to Claude Bailey (left) and Gerald Seiler (right). Bottom left insert shows whorled leaf arrangement, and upper right insert depicts flower in full bloom.



Helianthus porteri is an annual, diploid species characterized by small, conical heads and long, narrow leaves on basally branched plants up to 1 m in height (Rogers *et al.*, 1982; Schilling, 2006). Collection sites for *H. porteri* were all granite rock outcrops, and all but one was in Georgia, although the species is also found in AL, NC and SC (Figure 3). This habitat is unique, consisting of “islands” of vegetation a few meters wide occurring in shallow depressions on the otherwise barren rock surface. Mosses, lichens, and bryophytes initially colonize these islands, and when enough organic matter accumulates, larger successional plants are found. Plant

species associated with *H. porteri* in these granite outcrops include: *Agrostis elliotiana* (bentgrass), *Arenaria brevifolia* (sandwort), *Bulbostylis capillaris* (tufted sedge), *Sedum smallii*, *Hypericum gentianoides* (pineweed), and *Minuartia uniflora* (oneflower stitchwort) (Murdy and Carter, 2000). *H. porteri*, along with *S. smallii* and *M. uniflora*, are considered the dominant annual forbs in these habitats (Shure and Ragsdale, 1977). Population size of *H. porteri* at each site varied from ~ 500 to nearly 2000 plants. The one *H. porteri* site at Rocky Face (Alexander County), NC is not a natural occurrence, but was planted as part of an ecological study (Mellinger, 1972) and has since become established. The greatest concentration of granite outcrops, and thus sites for *H. porteri*, is in GA, with fewer sites in AL and SC (McVaugh, 1943). The species is extremely floriferous and productive. Seed size, at 0.15 g/100 seeds, was the smallest of any species collected on this trip. Since there were no previous accessions of *H. porteri* in any USDA-ARS seedbank, the eight collections made on this trip comprise the entire array of available germplasm.

Helianthus verticillatus is a robust (up to 4 m in height) diploid perennial species, characterized by its unique verticillate leaf arrangement in whorls of three and sometimes four (Figure 4) (Matthews *et al.*, 2002). *Helianthus verticillatus* is currently known from only two areas: Madison County in western TN and the Coosa River valley, straddling the Alabama-Georgia border (325 km from the TN area). The Coosa River valley area encompasses Cherokee County in AL and Floyd County in GA, but the populations in these counties are reported to be < 5 km apart. Plant population size was modest at both locations, ranging from 100 to 200 plants. The Coosa River valley area contains several known locations of this species, most of which are on private land. One such concentration is on land owned by a timber company, and the Nature Conservancy has obtained a "conservation easement" ensuring protection of all rare species on a 375 ha tract of land. The two collections of *H. verticillatus* are the only two accessions in the current USDA-ARS seedbank. According to a recent study, despite the fact that only three sites of this species are currently known, there is considerable genetic variation between these populations (Ellis *et al.*, 2006). The study also presents molecular evidence to confirm that *H. verticillatus* is a valid species and not a hybrid between *H. eggertii* and *H. angustifolius* or between *H. grosseserratus* and *H. angustifolius*.

While our primary objective on this trip was to collect the four species mentioned above, this southeastern part of the US is extremely rich in *Helianthus* species, with at least 27 other species recorded (Rogers *et al.*, 1982; Weakley, 2006). During the trip we also made four collections of three other species: *H. angustifolius*, *H. atrorubens*, and *H. smithii*. Collection site and seed information for these other species is found in Table 2.

CONCLUSIONS

The three target species, *H. eggertii*, *H. porteri*, and *H. verticillatus*, are all restricted geographically, they exist as relatively few populations, and in one case (*H. porteri*) endemic to a unique habitat. *Helianthus eggertii* was listed by the USFWS and protected by federal regulations. According to federal guidelines (USFWS, 2005), a species is considered to be endangered if "it is in danger that it will become extinct throughout all or a significant portion of its range," while the definition of a "threatened" species is one that is "likely to become endangered in the foreseeable future." *Helianthus eggertii* was proposed for "threatened" status in 1994 and listed as such in 1997. However, due to research both to manage existing populations of *H. eggertii* and surveys to document additional populations, the threatened classification was removed from *H. eggertii* as of August, 2005. Distribution of *H. verticillatus* seed is not restricted by the USFWS as this species is currently a "candidate" for listing, and not formally considered threatened or endangered (USFWS, 2002).

The optimal habitat for *H. eggertii* is dry, open areas within forests. While this habitat type can be artificially maintained in some instances, such as the AEDC site in TN for *H. eggertii*, it is less feasible to manage habitats for plants in instances where rare plants occur on private land. However, where this species occurs on roadsides or in power line right-of-ways, management practices have been devised which both help plant survival and address the needs of those sites. Thus, when there is a sizeable population of *H. eggertii* on a highway roadside, the state highway department does not mow that portion of the roadside until after November 15, which allows seed maturation and population stability. Likewise, utility companies are managing woody brush under power lines by mechanical pruning and without herbicides, late in the growing season to minimize damage to rare herbaceous plants.

We have succeeded in collecting a reasonable number of populations of *H. eggertii* and *H. porteri*, which hopefully encompass a wide portion of the genetic diversity of those species. It would be wise to collect seeds from additional populations of *H. verticillatus* since only two populations were sampled.

This exploration addressed a specific need of the USDA-ARS sunflower collection of obtaining seed of species previously not adequately represented (Table 1). Subsequent collections in 2003 to 2006 have targeted additional under-represented species, such as *H. californicus*, *H. pumilus*, *H. cusickii*, and *H. resinosus*. We anticipate future trips will target the remaining species that have no or few accessions in the seed collection, such as *H. agrestis*, *H. arizonensis*, *H. glaucophyllus*, *H. laciniatus*, *H. longifolius*, *H. occidentalis* spp. *occidentalis*, and others.

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BÚSQUEDA Y RECOLECCIÓN DE LAS ESPECIES RARAS DEL GÉNERO *Helianthus* EN LA PARTE SURESTE DE LOS EE.UU.

RESUMEN

La expedición de diez días de duración, durante la cual fue recorrido 4600 km en los estados sureste de los EE.UU., Tennesi, Carolina del Norte, Carolina del Sur, Georgia y Alabama, fue emprendida en mes de octubre de 2003. El objetivo principal fue encontrar las poblaciones de la especie *Helianthus eggertii*, que en aquel entonces estaba en el listado de las especies en peligro de extinción de la USDI, Agencia de Pesca y el Mundo Salvaje, y de la especie *H. verticillatus*, que fue candidato para la inscripción en el listado de las especies en peligro de extinció. Mientras tanto, *Helianthus eggertii* fue quitada del listado (en agosto de 2005). El objetivo adicional fue la recolección de semillas de la especie *H. porteri*, una especie que ha sido preclasificada de la especie *Viguiera porteri*, que aparece como endémica en las perturbancias de granito de las montañas en Georgia. Fue recolectado 27 poblaciones de tres especies susodichas tanto como de tres especies adicionales, *H. angustifolius*, *H. atrorubens* y *H. smithii*. La semilla se confirió a custodia en la Estación de Introducción de Plantas USDA-ARS, en la región septentrional-central, Eims, Iowa (NCRPIS); 24 de 27 de las muestras recolectadas están listas para el intercambio. Tres especies "de meta" están representadas a través de 13 muestras de la especie *H. eggertii*, 8 muestras de la especie *H. porteri* y 2 muestras de la especie *H. verticillatus*; Ninguna de dichas tres especies, hasta el momento, ha sido presentada en la colección de girasol de NCRPIS. La puesta en disposición de la semilla de dichas tres especies a los investigadores a lo largo del mundo, permitirá la investigación de estas tres especies del género *Helianthus* de dar la contribución por las características útiles de girasol cultivado. Los datos sobre la colección completa, fueron introducidos en la Red USDA-ARS GRIN (Germplasm Resource Information Network), que puede encontrarse en Internet (www.ars-grin.gov).

RECHERCHE ET CUEILLETTE D'ESPÈCES RARES D'HELIANTHUS dans le sud-est des Etats-Unis

RÉSUMÉ

Un voyage de dix jours et de 4 600 km dans quelques états du sud-est des États-Unis (Tennessee, Caroline du Nord, Caroline du Sud, Georgia et Alabama) a été entrepris en octobre 2003. Le but principal était de trouver des populations de l'espèce *Helianthus eggerti* qui était à cette époque sur la liste de l'Agence de protection des espèces de faune et de flore sauvages menacées (USDI), et des populations de l'espèce *H. verticillatus* qui était susceptible d'y être inscrite. Depuis, l'espèce *Helianthus eggertii* a été retirée de la liste (en août 2005). Le second but de la recherche était de recueillir des graines de *H. porteri*, une espèce reclassée de l'espèce *Viguiera porteri* qui apparaît

comme endémique sur les affleurements de granit en Georgia. Vingt-sept populations des trois espèces mentionnées ainsi que trois espèces supplémentaires, *H. angustifolius*, *H. atrorubens* et *H. smithii* ont été récoltées. Les graines ont été déposées à la Station pour l'introduction des plantes USDA-ARS, région nord-centre, Ames, Iowa (NCRPIS) ; 24 des 27 échantillons recueillis sont prêts à être distribués. Les trois espèces "ciblées" sont représentées par 13 échantillons de l'espèce *H. eggertii*, 8 de l'espèce *H. porteri* et 2 de l'espèce *H. verticillatus* ; jusqu'à maintenant aucune de ces trois espèces n'avait été présentée dans la collection NCRPIS. La disponibilité de ces trois espèces permettra aux scientifiques du monde entier d'examiner le potentiel de ces trois espèces du genre *Helianthus* et de contribuer ainsi à l'exploitation des caractéristiques utiles de ces espèces *Helianthus* sauvages dans la culture du tournesol cultivé. Les données sur la collection complète ont été introduites dans le réseau USDA-ARS GRIN (Germplasm Resource Information Network) qu'on peut trouver sur la toile <http://www.ars-grin.gov>.