



Chapter News

SPECIAL MID-MONTH ISSUE

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Mr. Cornell Goes to Washington

In the United States, our federal government owns vast tracts of lands collectively designated *public lands*. The majority of these lands are held in trust for the American people by the federal government and managed by several agencies:

- **Department of Agriculture**
United State` Forest Service
- **Department of Commerce**
National Oceanic and Atmospheric Administration
- **Department of Defense**
Army Corps of Engineers.
- **Department of the Interior**
Bureau of Land Management, Bureau of Reclamation,
Fish and Wildlife Service, National Park Service.

The U.S Fish and Wildlife Service administers National Wildlife Refuges throughout the United States. Under the terms of the enabling legislation — National Wildlife Refuge System Administration Act of 1966 — the Secretary of the Department of the Interior possesses the authority to acquire additional lands.

On October 30, 2013, Representative. Stephen Lee Fincher, a Republican representing the 8th Congressional District of Tennessee, introduced a bill in the House of Representatives. Known as The National Wildlife Refuge Expansion Limitation Act of 2013 (H.R. 3409), the stated purpose of the bill is to

"[amend] the National Wildlife Refuge System Administration Act of 1966 to prohibit the Secretary of the Interior from expanding any national wildlife refuge, except as expressly authorized by a law enacted after January 3, 2013."

If this Act ever becomes law, the Secretary of the Interior will no longer have authority to acquire additional lands without specific authorization by Congress on a case-by-case basis.

The Act was referred to the House Committee on Natural Resources, and taken up by the House Subcommittee on Fisheries, Wildlife, Oceans, and Insular Affairs. The Subcommittee scheduled Oversight Hearings to consider four bills, including H.R. 3409, to take place on July 23, 2014.

The National Wildlife Refuge Association immediately sprang into action. NWRA is a Washington-based non-profit whose stated mission is:

"to conserve America's wildlife heritage for future generations through strategic programs that protect and enhance the National Wildlife Refuge System and the landscapes beyond its boundaries."

NWRA sent appeals to its member organizations — including Friends of Brazoria Wildlife Refuges — seeking persons who could represent it at the Oversight Hearing.

FOBWR President (and TMN-COT member) Ed Barrios, suggested that FOBWR Grant Administrator (another TMN-COT member) Marty Cornell would be an ideal candidate to represent NWRA.

And so it was that Mr. Martin Clifford Cornell III, Grant Administrator, Friends of Brazoria Wildlife Refuges, speaking on behalf of the National Wildlife Refuge Association, appeared before the House Subcommittee on Fisheries, Wildlife, Oceans, and Insular Affairs on July 23, 2014. The full text of Marty's presentation, along with his personal story of the adventure, appear on the following pages.



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Mr. Cornell Goes to Washington: The Backstory

by Marty Cornell

It all started, for me at least, with a bottle of Quinta do Crasto Toriga National Reserva 2011. A bribe by Ed Barrios. Being in a relaxed mood, I took the challenge perhaps a bit more casually than justified by later circumstances.

It helped that I have deep buy-in for our refuge's plan to preserve a critical amount of bottomland forest. A plan that is in jeopardy should a Bill by Congressman Fincher (R-Tenn.) become law. H.R. 3409, is just one sentence: "The Secretary may not **expand** any national wildlife refuge except as expressly authorized by law enacted after January 3rd, 2013." [Emphasis added]. "The Secretary" would be the Secretary of the Department of the Interior. It would take an act of Congress to add any parcel of land to a refuge, even if it was donated.

Thus the US Fish and Wildlife Service found itself looking for folks to challenge H.R. 3409 in a hearing where the Bill was suddenly put on the July 23rd docket of the House Subcommittee on Fisheries, Wildlife, Oceans, and Insular Affairs. (Yeah, I too had to look up "Insular Affairs".) For the sacrificial lamb, the Service chose Mr. Steve Guertin, Deputy Director of the Service. It seems that it is customary for irate congressmen, in this case the Honorable Stephen Fincher, to provide representatives of the Administration with a copious quantity of verbal abuse during the post-testimony part of the hearing process.

It is also considered bad form for a congressman to abuse an ordinary citizen called to testify. So the National Wildlife Refuge Association put out a quick call to refuges engaged in expansion for a candidate ordinary citizen. Jennifer Sanchez of our Mid-coast National Wildlife Refuge Complex got one call, and quickly called Ed Barrios, which is how I found myself sipping a delicious wine from the Portuguese Douro Valley at Ed's mid-afternoon on Monday, July 14th.

"No big deal" Ed explained as he poured a second glass. "As the Grant Administrator for Friends, you have all



the data needed to write the testimony for the Congressional Record, and you have experience giving presentations." "And the NWRA pays your travel expenses", he threw in as a sweetener. So, during a phone chat with NWRA folks, I accepted the challenge. While imbibing the third glass, Ed casually remarked that the quasi-final draft of the written document, with figures, graphs, and references, would need to be in to the NWRA folks by the coming Friday afternoon for review, with the final version submitted to the House Subcommittee one week hence, on Monday, July 21st. 9:00 am sharp, CST. I did not get much sleep that week.

It evolved that the essence of my challenge would be first to highlight the importance of preserving an amount of the Columbia Bottomlands forest critical to resident and migratory birds, and that the Complex has an approved plan to do so involving land parcels donated or purchased with non-government grant funds or Duck Stamp money (Migratory Bird Conservation Fund). Secondly I would use the Dow Woods Unit as an example of land, donated by Brazoria County's largest employer, which would require a cumbersome act of Congress to acquire if H.R. 3409 became law. I confess to frequently peppering my testimony with adjectives like "critical" and "crisis", apparently preferred by government entities.

It turned out that my interpretation of the Bill was different than that of the NWRA, the Service, and per his pre-testimonial remarks, that of Congressman Fincher. It evolved that constituents in the 8th Congressional

District of Tennessee were upset over a new acquisition zone proposed by the Service; I recall the Congressman phrasing this as an "another Federal land grab". But my reading of "**expand**" was not restricted to new acquisition zones, but would also include properties within zones already approved with public and state buy-in. "OMG", said the NWRA, "We never looked at it that way". Mr. Guertin's testimony was subsequently revised to reflect this worst-case possibility.



With my written testimony sanctioned, it was now time to address the really hard stuff, which for my wife, Carole, included me getting a haircut and selecting the appropriate coat and tie (did I still have a tie somewhere?). And reducing the 12-page written testimony down to a five-minute oral talk. The Subcommittee really does have a stoplight on the witness table; green for the first four minutes, yellow for the last minute, and you are cut off with the red light.

Over the weekend, it dawned on Ed that he could get to D.C. with frequent flyer miles. With Congress in session, hotel rooms were at a premium, and the NWRA finally found accommodations for me at the Residence Inn. So I offered the couch of my suite to Ed, provided he carry my bags, took photographs, and bought me one great dinner; I choose the restaurant and wines. Ed agreed.

Tuesday morning, July 22nd, off we go to our nation's capital to meet with the NWRA staff, going over my oral and getting briefed on the ways of

continued on next page

Mr. Cornell Goes to Washington: The Backstory

by Marty Cornell



congressional hearings. Which stipulates that an invitation to testify can only come from a member of Congress, which for this Bill would need to come from the “ranking member” (euphemism for longest-serving member of the minority party) of the subcommittee, in this case Congressman Peter DeFazio (D, Oregon). Here I am assured that, although bad manners will prevail toward administration witnesses, it is unlikely that I will be picked on, and if I am, it is nothing personal, but just part of the theater of such hearings. I spend the evening reading and rereading my oral. Ed tries to ignore me by reading emails.

The next morning I read and reread my oral. Ed has it memorized in case I get laryngitis or something, but says he would have trouble starting with “Good morning. I’m Marty Cornell....” At 9:00 off we go to the Longworth House Office Building, wearing sport coats with our Call-to-Service pins on our lapels (very sharp!). The room for the House Committee on Natural Resources is small from what we typically see on TV, but otherwise as you would expect: lots of wood paneling, and an elegant chandelier, a classic art-deco style mural behind the committee chairman’s chair, and a wood horseshoe of a desk for the congressmen, elevated so that they can stare down on the witnesses.

And of course the table with its spotlight for the witnesses and seating for the public behind. In the middle of the horseshoe is a remote-controlled camera to record and broadcast live the proceedings. I am the last of six people giving testimony, two of us on H.R. 3409, and the others for three

other Bills being considered.

As folks file in, I am handed a list of “marshmallow” questions typed by Congressman’s DeFazio’s staff, for my preview. These are also passed out to the Democrats in attendance to ask me in the post-oral inquisition. Again part of the pre-staged theater.

Near me is Desiree Sorenson-Groves, political liaison (lobbyist) for the NWRA. She looks up congressman on her smart phone as they enter the chamber, and passes her phone on to me. We get into a rhythm of exchanging notes written on her note pad.

I am nervous about exceeding five minutes. And about stumbling as I start talking, as I did when practicing at home. “Good morning. I am Morty Cornell.” Which brought tears of laughter to Carole each time I did it.

We are divided into two panels, with Mr. Guertin of the Service going first. After each panel, any congressmen so interested can have five minutes (red light applies) to question witnesses. I listen to others, including congressmen, and many verbally stumble. I now relax and enjoy the show.

After the first panel, Congressman Fincher grills Director Guertin, asking questions and interrupting answers. It



should replay well to the constituents of Tennessee’s 8th Congressional District.

Having finished his performance, the Honorable Congressman leaves. I was hoping he would stick around for my comments about his bill. I guess this would not play well in the 8th Congressional District of Tenn.

The first panel is dismissed and we on the second panel are seated. I note that only one Democratic congressman remains. “Doesn’t matter” I am told. “This is all just for the record.” Republicans engaged with the other bills remain until they ask their post-testimony questions, or in fact, state their positions for the record. I get asked only one of the marshmallow questions from the one remaining member of the minority. The whole experience was surreal.

After thanks by the subcommittee chairman, we are dismissed. Desiree works the crowd. We are told that H.R. 3409 is likely to be reworded to exempt already approved land acquisition plans. Perhaps a small victory is in the works.

We retire for a late three-hour lunch with Joan Patterson of the NWRA. We debrief and I pull out my list of Wine Spectator award winning restaurants and pay special attention to their wine lists.....

What a country!

—Marty

Photos courtesy of Ed Barrios.

H.R.3409 - National Wildlife Refuge Expansion Limitation Act of 2013

113th Congress at the 1st Session

The image the right is a digital (JPG) copy of the official PDF copy-of-record of H.R.3409.

The original is available here:

<http://tinyurl.com/HR3409-113>



This bill was introduced in the House of Representatives by Rep. Stephen Lee Fincher (R-TN-8) on 10/30/2013 and referred to the House Committee on Natural Resources.

Rep. Fincher

The Natural Resources Committee assigned the bill to the House Subcommittee on Fisheries, Wildlife, Oceans, and Insular Affairs.

The Subcommittee on Fisheries, Wildlife, Oceans and Insular Affairs is

responsible for all issues pertaining to wildlife resources, fisheries, oceanography, and insular areas. The insular areas of the U.S. include the territories of American Samoa, Guam and the U.S. Virgin Islands (USVI), as well as the Commonwealth of the Northern Mariana Islands (CNMI) and the Commonwealth of Puerto Rico.

The Subcommittee scheduled Oversight Hearings to consider four bills to take place on July 23, 2014.

- H.R. 3109 (Young of AK), to assist Alaskan Native Handicrafts.
- H.R. 3409 (Fincher), To amend the National Wildlife Refuge System Administration Act of 1966 to require that any expansion of a national wildlife refuge must be expressly authorized by statute. "the National Wildlife Refuge Expansion Limitation Act"
- H.R. 5026 (Gosar), To prohibit closing or repurposing any propagation fish hatchery or aquatic species propagation program of the Department of the Interior unless such action is expressly authorized by an Act of Congress, and for other purposes. "the Fish Hatchery Protection Act"
- H.R. 5069 (Fleming), To amend the Migratory Bird Hunting and Conservation Stamp Act to increase in the price of Migratory Bird Hunting and Conservation Stamps to fund the acquisition of conservation easements for migratory birds, and for other purposes. "the Federal Duck Stamp Act"

Mr. Martin Clifford Cornell III was the last panelist of the day.



113TH CONGRESS
1ST SESSION

H. R. 3409

To amend the National Wildlife Refuge System Administration Act of 1966 to require that any expansion of a national wildlife refuge must be expressly authorized by statute.

IN THE HOUSE OF REPRESENTATIVES

OCTOBER 30, 2013

Mr. FINCHER introduced the following bill; which was referred to the Committee on Natural Resources

A BILL

To amend the National Wildlife Refuge System Administration Act of 1966 to require that any expansion of a national wildlife refuge must be expressly authorized by statute.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the "National Wildlife Ref-
5 uge Expansion Limitation Act of 2013".

2

1 **SEC. 2. PROHIBITION ON EXPANSION OF NATIONAL WILD-**
2 **LIFE REFUGES.**

3 Section 4(a) of the National Wildlife Refuge System
4 Administration Act of 1966 (16 U.S.C. 668dd(a)) is
5 amended by adding at the end the following:

6 "(6) The Secretary may not expand any national
7 wildlife refuge except as expressly authorized by a law en-
8 acted after January 3, 2013."

Image of HR 3409 as published by the 113th Congress
<https://beta.congress.gov/bill/113th-congress/house-bill/3409/text>

**Testimony before the
Subcommittee on Fisheries, Wildlife, Oceans and Insular Affairs
United States House of Representatives Committee on Natural Resources
Wednesday, July 23, 2014
On H.R. 3409, National Wildlife Refuge Expansion Limitation Act of 2013
By
Martin C. Cornell
Grant Administrator
Friends of Brazoria Wildlife Refuges**

I am Marty Cornell. I retired twelve years ago after 35 years as a scientist for The Dow Chemical Company, and since then I have been an active volunteer and member of the board of the Friends of Brazoria Wildlife Refuges (Friends). I am here today in that later capacity, where I serve as Grant Administrator. In that role, I apply, administer, and report on a constant flow of grants and gifts to support three National Wildlife Refuges located along the mid-coast of Texas; the Brazoria, San Bernard, and Big Boggy National Wildlife Refuges. These three refuges are administered by the Texas Mid-coast National Wildlife Refuge Complex (TMCNWRC). Many of these grants and gifts are targeted to support the acquisition of tracts of land for the San Bernard National Wildlife Refuge (SBNWR). I shall be using the experience of the San Bernard NWR to frame our case regarding the Bill H.R. 3409.

I very much appreciate the opportunity to speak to this subcommittee on the negative impacts that would occur to the Land Protection Plan of the San Bernard NWR if the Bill, H.R. 3409, known as the National Wildlife Refuge Expansion Limitation Act of 2013, were to become law.

First, some orientation is in order. Starting in 1966, the Department of the Interior, under the US Fish and Wildlife Service (USFWS), began acquiring land in Brazoria County, Texas, because this region along the Gulf coast, with our coastal shores, bays, estuaries, prairies, and riparian forests, is an ideal habitat for wildlife, especially for resident and migrating birds.

Of special importance are the bayous, streams, and three major rivers in Brazoria and neighboring Matagorda County that empty into the Gulf of Mexico, the Brazos, San Bernard, and Colorado Rivers. These rivers and streams support old growth hardwood forests that provide shelter, food, and water for native and migrating wildlife. Named Austin's Woods or the Columbia Bottomlands Forest, this land is the southernmost riparian forest along the Gulf Coast of the United States (figure 1). It is an oasis, separated from other coastal forests by vast expanses of prairie, farmland, and urban areas.

Prior to European settlement, these forests and wetlands consisted of about 700,000 acres. Their location and size attracted Nearctic and Neotropical migrating birds, and became ingrained in their instinctive migration routes. Today, millions of birds make this trek

through the Columbian Bottomlands forests, many taking the 600-mile path from Mexico's Yucatan Peninsula over the Gulf of Mexico to the Columbia Bottomlands Forest, where they find safe haven (figure 2). This pattern is dramatically shown on figure 3 in the Doppler radar image taken in February, 2006, with massive flocks nearing our coastline, and other birds, having rested and refreshed, continuing their journey north to breeding grounds.

Because of our unique location and ecology, we are blessed to have over 100 species of resident birds, and in 1997 counted 237 species of non-resident birds, totaling over 29 million individuals, migrating through our forests. During migration, bottomland hardwood forests are particularly valuable to a large variety of warblers, vireos, thrushes, tanagers, buntings, goatsuckers, and other forest birds that seek out forest resources after a long flight to recuperate and refuel. In Mississippi, research has demonstrated that Neotropical migrants using coastal forests are found in increasing abundance with increasing density of forest trees and increasing numbers of insects in forest understories.

This makes southern Brazoria County and our refuges a Mecca for birders from all over the world. A 2011 survey by the USFWS estimated that one million people ventured away from home to observe wildlife in Texas and spent \$1.8 billion in the process. Over 75,000 visitors enjoy our three refuges each year, including over 32,000 who cite wildlife observation as the attraction for touring the San Bernard and Brazoria National Wildlife Refuges. Additionally, 3,400 visitors hunt migrating waterfowl during the hunting season and an estimated 30,000 fishermen enjoy the bays and estuaries of the complex; 70% of them by boat. Using the expenditure per person ratio from the 2011 USFWS survey, this equates to \$1,800 per person in direct and trickle down impact, or \$118 million per year for the ecotourism on our refuges.

We are also fortunate that southern Brazoria County and the adjoining Matagorda, Fort Bend, and Wharton counties remain largely rural, despite being as close as a one hour drive from Houston, Texas, the fourth largest metropolis in the United States. A great many of the industrial and private landowner neighbors of our refuges fully appreciate the value of our natural ecosystems, as opposed to urban sprawl, and offer property to be donated or sold to the US Fish and Wildlife Service.

A recent example of this is a 338-acre tract of bottomlands forest, bisected by Bastrop Bayou, and located within the extraterritorial jurisdiction of the City of Lake Jackson, Texas. This land, appraised at \$1,800,000, was donated to the San Bernard National Wildlife Refuge by The Dow Chemical Company, our county's largest employer. Subsequent development of 2.5 miles of ADA-compliant trails and other facilities were made possible from over \$300,000 in grants and gifts awarded to the Friends of Brazoria Wildlife Refuges. Today, this Dow Woods Unit of the San Bernard NWR is an "urban refuge" that was enjoyed by over 4,500 visitors in 2013, with visitation growing as the recently completed trails become better known (figure 4).

It is noteworthy that the provision of the proposed National Wildlife Refuge Expansion Limitation Act of 2013 would have required a time-consuming and cumbersome act of congress for this donated land to become part of our refuge system. With such a substantial negative impact, the question is begged, "What would be the net gain if H.R. 3409 were to become law?" In our case, where only a small portion of discretionary federal funds are involved, the answer would lead to a loss to the citizens, not a gain.

The Dow Woods Unit is also an example of public access development done with private funds, such as those from our Friends organization.

The Friends of Brazoria Wildlife Refuges was chartered in 1994 and became a 501(c)(3) tax-exempt organization in 1995. One of our major activities is to acquire funds through grants, gifts, and fundraising efforts. These funds are used to develop public use facilities, support environmental education programs, and conduct wildlife surveys. Over 36% of these funds support pre-land acquisition discovery activities, which streamlines the process of acquiring donated or purchased tracts of property, such as the Dow Woods Unit (figure 5).

In 1997, concern over the rapid destruction of prime, old-growth bottomland hardwood forest in the Columbia Bottomland ecosystem led to a coordinated effort by federal, state, and local government agencies, together with landowners and conservation organizations, to preserve enough of this forest and adjoining prairie to sustain its biodiversity on which substantial populations of migratory birds depend. It is believed that 70,000 acres would provide this insurance (ten percent of the original 700,000 acres).

As part of the resulting 1997 Decision Document of the Austin's Woods Conservation Plan, the US Fish and Wildlife Service was authorized to purchase of up to 28,000 acres as its share of the 70,000-acre goal of the involved conservation partners. For various reasons, the other partners have since been unable to execute any substantial land purchases. They have, however, been active in assisting the Service in its land-acquisition process. On June 25, 2013 the Service authorized an increase of the acquisition cap to the full 70,000 acres within the established acquisition boundary shown on figure 6.

Over the 16 years through the end of 2013, over 33,000 acres have been acquired by the U.S. Fish and Wildlife Service, as shown on the map of figure 7. Details of this plan are covered in the Texas Mid-coast NWR Complex Comprehensive Conservation Plan and Environmental Assessment, approved in September, 2013.

It is noteworthy that 61.1% of the funds for the acquisition of this land came from the Migratory Bird Conservation Fund (MBCF), paid for by Duck Stamps sold to duck hunters and aficionados of the stamp art. The funds are thus fees paid by appreciative users of wetland ecosystems, to the benefit of future generations of all Americans. 16.6% of the cost of the land purchased came from private grants, and 14.9% represents the appraised value of donated tracts of land. Only 7.5% of the cost of acquisition came from congressional appropriation via the Land and Water Conservation Fund (figure 8).

All of these 33,636 acres were obtained from willing donors and sellers, primarily via fee title purchase. Non-profit organizations like the Trust for Public Land, The Conservation Fund, and the National Fish and Wildlife Foundation often purchase and hold lands until the U.S. Fish and Wildlife Service completes due diligence and secures funding for acquisition. Friends, through grants from Houston Endowment, provides funds for pre-acquisition discovery processes. These non-profits provide elasticity to accommodate the timing needs of the seller and the funding constraints of the buyer. The result is a process that is steadily moving toward the goal of conserving a sustainable amount of Columbia Bottomland Forest ahead of urban encroachment as metropolitan Houston grows south.

Currently, the TMCNWR is working on the acquisition of twelve tracts of Columbia Bottomland forest, having a total of 21,805 acres, bringing us closer to our goal of 70,000 acres.

The current quantity of land in conservation status is not adequate to protect either the ecosystem or dependent wildlife species. The proposed National Wildlife Refuge Expansion Limitation Act of 2013 would essentially halt the process of preserving this critical amount of hardwood wetland forest, and threaten the dwindling population of migrating songbird species, which are in significant decline. Since H.R. 3409 would be retroactive to January 3, 2013, the over 3,800 acres of land acquired since then by the San Bernard NWR would be in jeopardy.

The bottom line is that H.R. 3409, which would stipulate that "The Secretary may not expand any national wildlife refuge except as expressly authorized by law enacted after January 3, 2013", is a blunt instrument. Congressional oversight is already provided by the Migratory Bird Conservation Act, which funds most of our refuge land acquisition programs. For these reasons, I respectfully request that HF3409 be rejected by this subcommittee and the United States House of Representatives.

I thank you for your time.

Martin (Marty) Cornell

Figures

Figure 1: Strategic location of the wildlife refuges of the Texas Mid-coast National Wildlife Refuge Complex

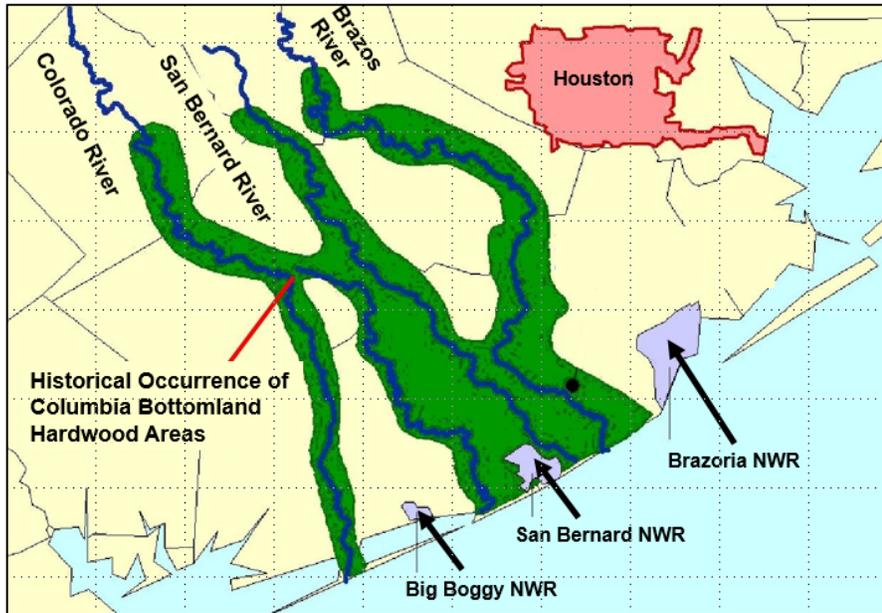


Figure 2: Spring northern migration pathways pass through the Columbia Bottomland Forests

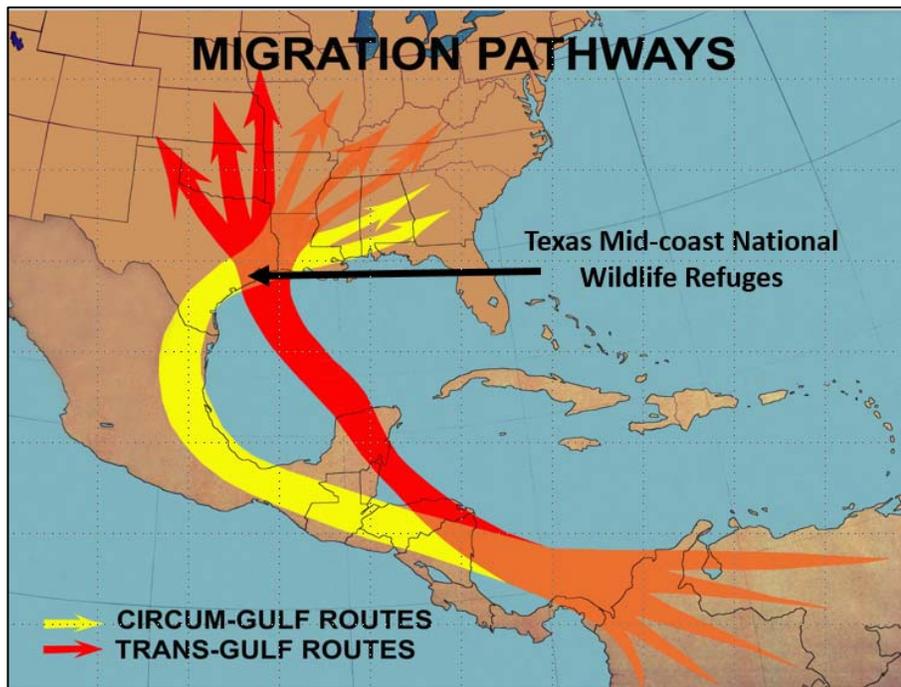


Figure 3: Doppler radar of the northern spring migration of Nearctic and Neotropical birds through the Columbia Bottomland forests. Dr. Sidney Gauthreaux, Jr.

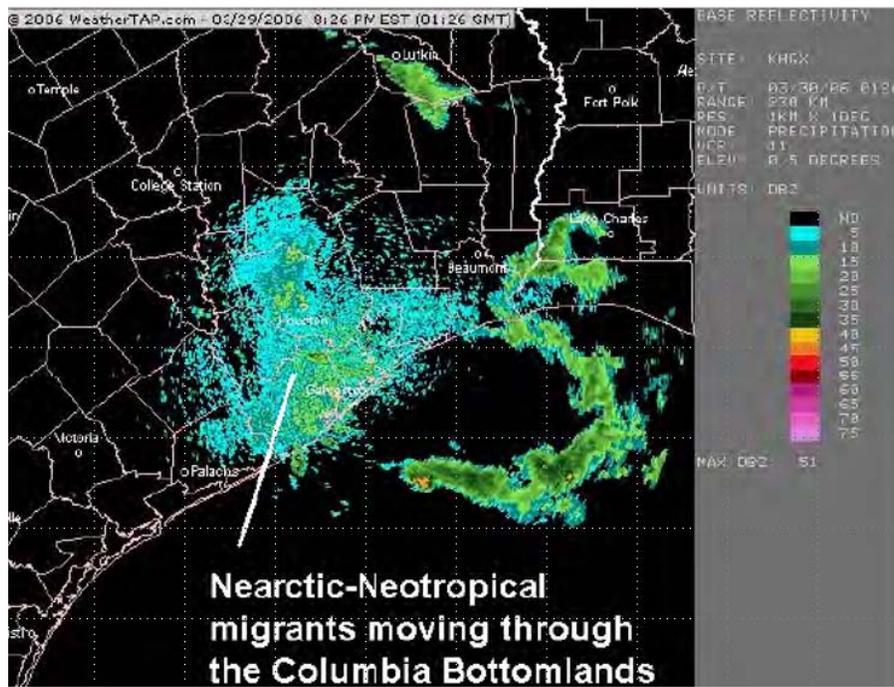


Figure 4: ADA-compliant trail in the Dow Woods Unit of the San Bernard NWR



Figure 5: Allocation of Friends Funds

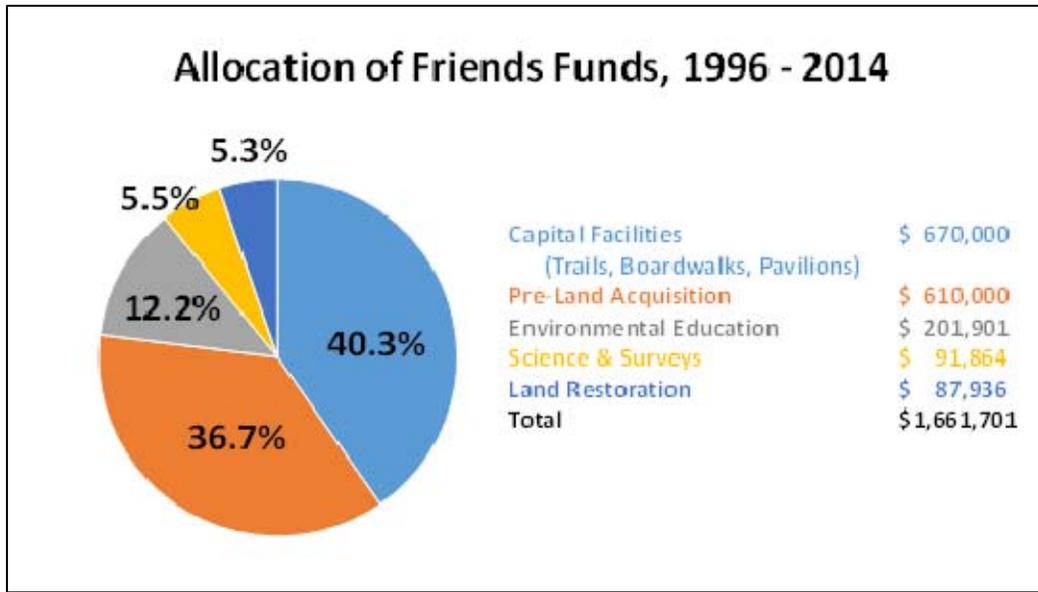


Figure 6: Acquisition Boundary of the Austin's Woods Units of the San Bernard National Wildlife Refuge

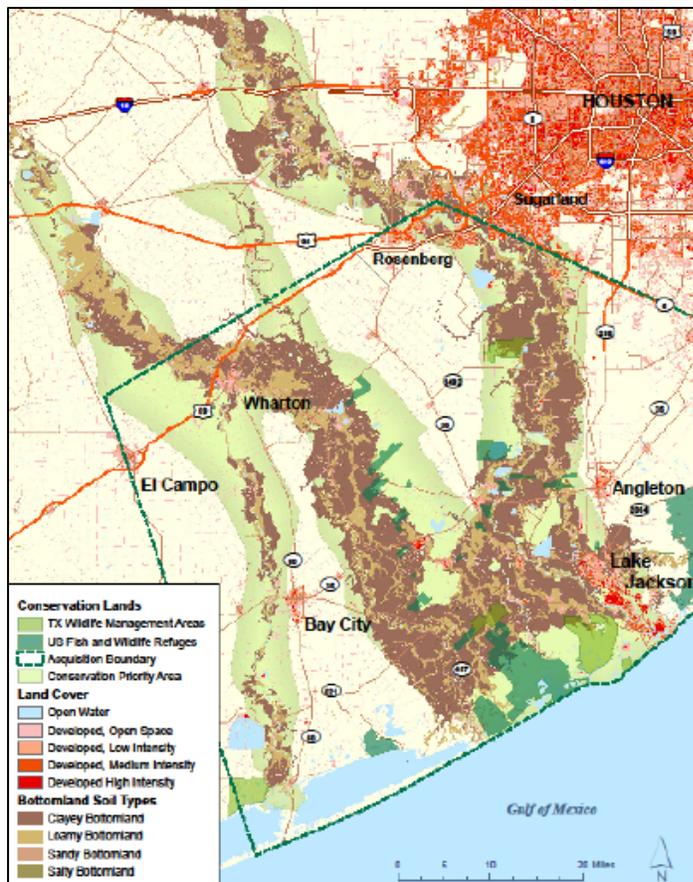


Figure 7: 33,653 acres of acquired and proposed additions to the conserved Columbia Bottomland Forest

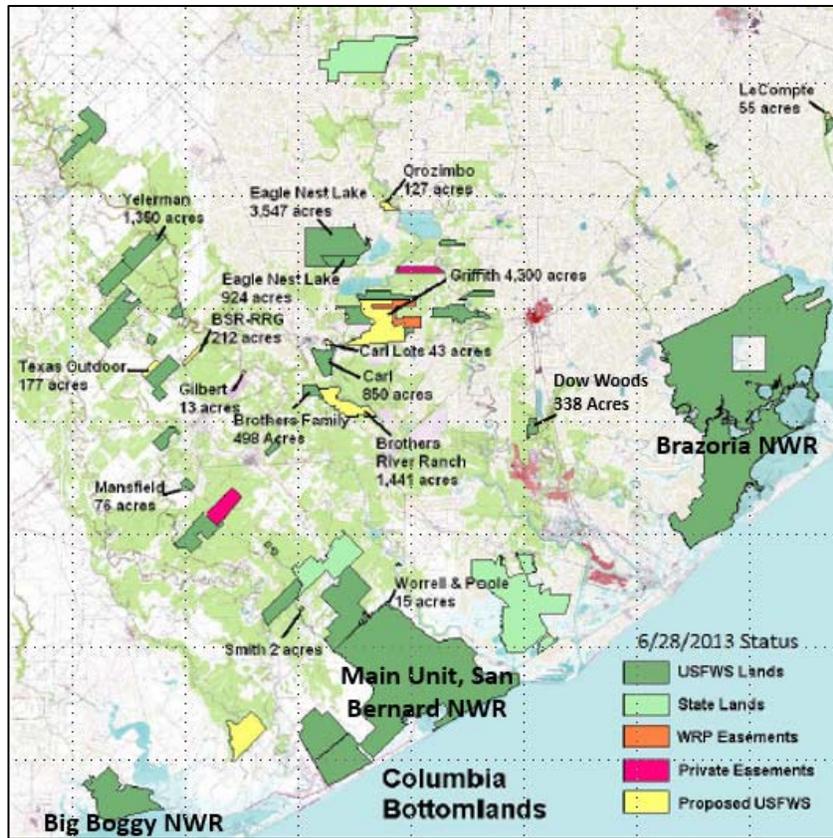
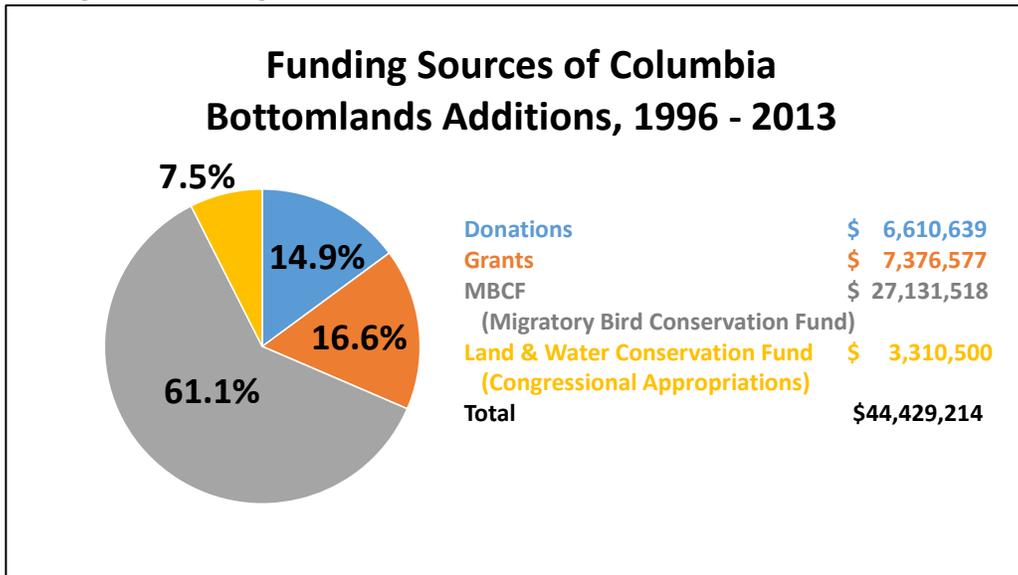


Figure 8: Funding Sources of Columbia Bottomlands Additions



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A MULTI-SCALE EXAMINATION OF STOPOVER HABITAT USE BY BIRDS

Jeffrey J. Buler ¹, Frank R. Moore , and Stefan Woltmann ²

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Most of our understanding of habitat use by migrating land birds comes from studies conducted at single, small spatial scales, which may overemphasize the importance of intrinsic habitat factors, such as food availability, in shaping migrant distributions. We believe that a multi-scale approach is essential to assess the influence of factors that control en route habitat use. We determined the relative importance of eight variables, each operating at a habitat-patch, landscape, or regional spatial scale, in explaining the differential use of hardwood forests by Nearctic–Neotropical land birds during migration. We estimated bird densities through transect surveys at sites near the Mississippi coast during spring and autumn migration within landscapes with variable amounts of hardwood forest cover. At a regional scale, migrant density increased with proximity to the coast, which was of moderate importance in explaining bird densities, probably due to constraints imposed on migrants when negotiating the Gulf of Mexico. **The amount of hardwood forest cover at a landscape scale was positively correlated with arthropod abundance and had the greatest importance in explaining densities of all migrants**, as a group, during spring, and of insectivorous migrants during autumn. Among landscape scales ranging from 500 m to 10 km radius, the densities of migrants were, on average, most strongly and positively related to the amount of hardwood forest cover within a 5 km radius. We suggest that **hardwood forest cover at this scale may be an indicator of habitat quality that migrants use as a cue when landing at the end of a migratory flight**. At the patch scale, direct measures of arthropod abundance and plant community composition were also important in explaining migrant densities, whereas habitat structure was of little importance. The relative amount of fleshy-fruited trees was positively related and was the most important variable explaining frugivorous migrant density during autumn. Although constraints extrinsic to habitat had a moderate role in explaining migrant distributions, our results are consistent with the view that **food availability is the ultimate factor shaping the distributions of birds during stopover**.

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Website	http://tmn-cot.org
Facebook	http://facebook.com/TMN.COT
Email Listserv	http://tinyurl.com/TMN-COT-Mail



MASTER NATURALIST EMAIL LISTS

TMN-COT Chapter list

- Instructions http://tmn-cot.org/Email_Lists/index.html
- Send messages to TMN-COT@googlegroups.com
- Message Archive <http://tinyurl.com/TMN-COT-Mail>
- All messages are sent immediately.

State Master Naturalist list

- Instructions <http://txmn.org/staying-connected/sign-up-for-tmn-listserv/>
- Subscribe listserv@listserv.tamu.edu
- All messages are held for moderation by the TMN State Coordinator

Apps and maps

<http://txmn.org/files/2013/09/NatureApps3-2013.pdf>

<http://tmn-cot.org/Maps/index.html>