

**From:** [Richard Jordan](#)  
**To:** [Jennifer Stanhope](#)  
**Subject:** Re: Comments for MVP and Candy darter  
**Date:** Wednesday, January 04, 2017 12:24:23 PM

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Yeah, definitely send it through Troy if he'll take a look at it. I'm still not great with all the rules of what I can/can't say to various groups, so anyone else that wants to do the censoring of my off the cuff remarks about CD/MVP would be great.

On Wed, Jan 4, 2017 at 10:52 AM, Jennifer Stanhope <[jennifer\\_stanhope@fws.gov](mailto:jennifer_stanhope@fws.gov)> wrote:

Hi Jordan,

Thanks for all this great information. Do you mind if I share with Troy to see if it's just ok to forward to MVP or if we need to distill it down to something more formal?

Jen

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**From:** Jordan Richard [mailto:[jordan\\_richard@fws.gov](mailto:jordan_richard@fws.gov)]  
**Sent:** Wednesday, January 04, 2017 8:46 AM  
**To:** Jennifer Stanhope  
**Subject:** RE: Comments for MVP and Candy darter

Hey Jen,

Here's what I can say about the Candy Darter w/ regards to MVP (I'll write for someone outside the Service to understand, so forgive the preamble):

The Candy Darter (*Etheostoma osburni*) is currently undergoing the USFWS Species Status Assessment (SSA) process – a comprehensive program designed to evaluate the condition and threats (both current and future) of species under consideration for threatened/endangered status. The SSA framework was developed specifically as a means of informing decision makers considering listing of species while keeping science and policy separate, I can't say anything about whether or not the candy darter is likely to be listed or not (because I truly don't know). With that said, as part of the SSA team, I *can* speak to what the current population and trends of the species look like and help make everyone aware of our timeline.

Candy darter populations can best be considered as three distinct units, within which individuals are usually found in tributaries:

1. Upper Gauley River (WV)
2. Upper Greenbrier River (WV)
3. Middle & Upper New River (VA populations)

The primary threat to Candy darters is dominant hybridization from introductions of nonnative Variegate darters. Variegate darters are native to neighboring drainages, but were naturally separated from Candy darter localities until they were widely introduced from use as fishing bait in trout streams. Barriers to fish movement (fall lines, dams, impoundments, etc.) are currently believed to be the only thing that really stops the spread of Variegate darters between systems. We have tracked the rate of hybridization with Variegate darters (and subsequent extirpation of Candy darters) up the Greenbrier River over the past decade, and the speed is unprecedented. Picture the “hybrid zone” as a continuum (genetically and spatially) with Candy darters at one end and Variegate darters at the opposite end. Geographically, in 2007, the Greenbrier looked like this spectrum: Candy darters were the only thing in the upper 2/3 of the watershed, while Variegates were exclusive to the lower 1/3 (a location that was historically Candy darter territory). Our latest data suggests (to put it mildly) that the entire Greenbrier River population is essentially a lost cause. A tributary stream called Anthony Creek feeds into the Greenbrier River between these two zones, and in 2007 it was the hotspot of the hybrid zone. Individuals in Anthony Creek were observed to be either Variegate darters or hybrids (Variegate x Candy). Above Anthony Creek, only Candy darters were found (no traces of Variegate or hybrid darters). Now, fast forward to 2014. A follow-up study found evidence of hybridization all the way up to the headwaters of the Greenbrier River (East & West Forks), with Anthony Creek (and other tributaries further upstream) now occupied exclusively by Variegate darters. There is a gradation (or spectrum/continuum – however you want to think of it) from the pure Variegate zone up to the headwaters with increasing proportions of Variegates and hybrids as you move downstream. What this means is that the hybrid zone pushed upstream > 40 km (linear – it’s even longer in terms of stream miles) and the leading edge jumped by almost 90 km (again, linear). This spread happened in ~ 7 years.

Sorry to be long-winded, but I can’t really explain the significance of individual populations without explaining the context. Now, given what I said above, we can reasonably expect the Greenbrier River population of Candy darters to disappear within a decade or two, and protecting/recovering these individuals is borderline (if not outright) impossible given that we don’t have any pure genetic stock to pull from. That leaves us with two extant populations: (1) the Upper Gauley River (and its tributaries) in WV above Summersville Dam, and (2) The VA populations of the Middle/Upper New River above Bluestone Dam in WV (Variegates have made it up to the dam and are sitting in the riffles of the dam tailrace). The VA populations are nothing like the two WV populations in terms of abundance/distribution. The Gauley and (previously) Greenbrier Rivers were large, widespread populations, while in VA Candy darters are highly localized with just a few small remnant populations. The four streams in VA with any individuals left are:

1. Stony Creek (Middle New River, direct tributary)
2. Laurel Creek (feeding into Wolf Creek, and eventually Middle New River)
3. Dismal Creek (feeding into Walker Creek, and eventually Middle New River)
4. Cripple Creek (direct tributary to the Upper New River, above Claytor Dam)

Of these four populations, Stony Creek is separated from the rest in that the population is much stronger (in terms of abundance and condition). Candy darters are believed to have been extirpated from their historic habitat in VA (which comprised almost all of the Middle & Upper New River and its tributaries) due to habitat loss/degradation. Early in the century much of the region was clear-cut and streams were degraded. Reforestation has restored the condition of many of these streams to the point that it is believed reintroductions of Candy darters to their historic habitats could be successful, but the small, fragmented condition of the remaining individuals makes natural recolonization highly unlikely (especially given the current state of the mainstem New River, which would have to serve as the “highway” between these habitats). With that said, the primary target for potential reintroductions identified by VDGIF and Virginia Tech researchers is Sinking Creek, a direct tributary to the New River neighboring the extant population in Stony Creek.

MVP’s projected route goes through the Upper Gauley River in WV, runs through ~ 7 km of the Stony Creek watershed in VA (and crosses Stony Creek ~2 km from its confluence with the New River), and goes through a large portion of Upper & Lower Sinking Creek (crossing Lower Sinking Creek and running parallel to long stretches of Upper Sinking creek, where it is only a couple hundred meters away from the stream). Impacts to look out for are sedimentation throughout the watersheds (a significant issue for darters) and direct mortality of individuals in the crossing at Stony Creek. Also, I don’t know anything about pipeline construction, but just to be safe I’ll say: if for any reason construction involves water withdrawals into tanks/trucks from streams that will be transported elsewhere, then the withdrawal/deposit locations need to be planned with extreme caution. The absolute worst thing that could happen is for water to be withdrawn from a hybrid/invaded zone and then poured out within one of the Candy darter zones (this applies to both the Gauley and New River watersheds).

Finally, here’s the overview for our planned SSA/listing determination schedule:

- April 2017 – SSA finalized
- April/May 2017 – Decision briefing, analysis, and decision record
- May/June – Federal Register (FR) document development

- September 2017 – FR document outreach and publication

I know this was long, but hopefully it will be somewhat useful. Let me know if there's anything I can do to help.

Jordan

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**From:** Jennifer Stanhope [mailto:[jennifer\\_stanhope@fws.gov](mailto:jennifer_stanhope@fws.gov)]  
**Sent:** Tuesday, January 03, 2017 2:25 PM  
**To:** Jordan Richard  
**Subject:** Comments for MVP and Candy darter

Hi Jordan,

Did you send comments to me to share with MVP about Candy darter including where it occurs and what they might want to consider in the BA? If you hadn't, could you by tomorrow COB?

Thanks!

Jen

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