

What We See with StructureScan

Get the most out of your HDS unit with Doctor Sonar

by Bruce Samson

Fishing electronics used to be as simple as the red and yellow flashing lights of a Lowrance flasher. How things have changed.

Today, depth finders give us high-definition returns and the groundbreaking 3-D images of Lowrance's StructureScan system for its HDS units. The new system truly is revolutionary.

StructureScan has both side-looking sonar and down-looking sonar, known as DownScan. The science behind it has changed how anglers view what is below the boat, but that's putting it mildly. The average sonar user can now interpret what is under him and what the lake bottom looks like even without mastering sonar interpretation. The StructureScan creates images so crisply detailed that patches of rock look like patches of rock and trees look like trees.

But is it really so simple? Yes and no. In the pages that follow, I'll help you interpret some StructureScan images that anglers are likely to encounter on the water. I'll also help you master some of the tools unavailable in previous technology, such as the enhanced capability to review sonar returns from hours or days ago. And there aren't even any flashing lights.

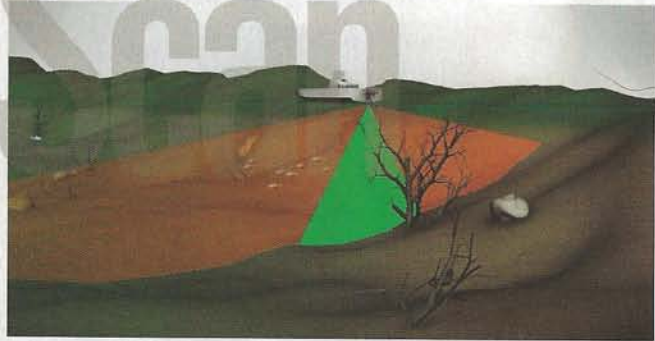
Part 1: How it Works

The DownScan and side-viewing sonars work together through a transducer developed by Lowrance with three crystals – two side-looking crystals and a down-looking crystal. The information gathered with the transducer is then sent to the LSS-1, which is “the black box.” It interprets the information and uses Ethernet to send the information to the HDS display or multiple displays for viewing.

DownScan gives better target definition than traditional sonar due to the shape of the cone formed by the expanding ring of sound waves emitted through the transducer. Traditional sonar has a round cone, which produces an “arch” return when it passes over a fish. This happens because the sonar reflects off the fish at the front edge of the cone, the center and then the far edge. The center of the arch is created when the fish is in the middle of the cone and closest to the transducer. The tails are created when it is in the edge of the cone and farthest from the transducer. DownScan, however, has a narrow, oblong cone. There is no “edge” to the cone, and therefore it produces a smaller return that shows up typically as a dot.

The side-viewing sonar has a similar cone, but it is, as the term suggests, pointed to look sideways instead of down.

The technology is similar to the advances in X-ray technology in medicine. Traditional X-rays were two-dimensional.



Side-viewing sonar (red cones) views what is on either side of a boat, while DownScan sonar (green cone) views what is directly beneath a boat.

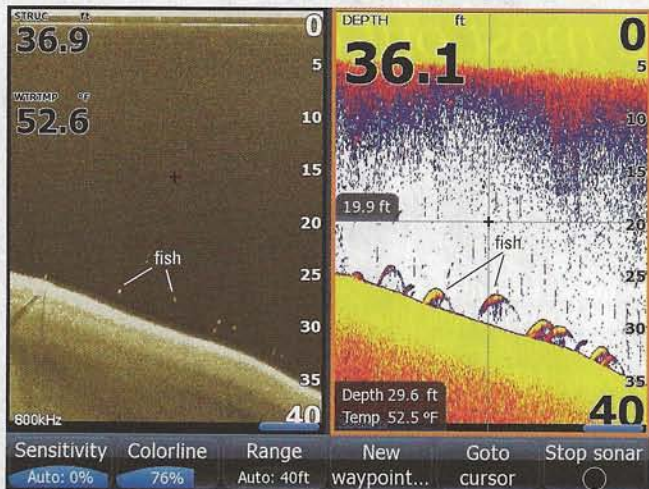
Then along came CT scanners, which took narrow X-ray slices and used a computer to process the slices and compute a picture in three dimensions. The DownScan and side-viewer take thin slices, and the sonar computes the image and displays it as a 3-D picture.

I am a retired medical doctor, and I remember seeing the first CT scan images. I was blown away. StructureScan had the same effect the first time I tried it out. I didn't fish for long. Instead, I drove around and entertained myself. StructureScan's entertainment value is still there, but I now use it to catch more fish.

Part 2: Comparing Fish Arches

Because of the differences in sonar cones between traditional sonar and StructureScan, fish show up as different “shapes” depending on which system you are using. Try using them in unison for easy comparison.

DownScan and Traditional Sonar Fish



Fish will look like an arch on a traditional sonar unit (right) at 1 to 6 mph. On DownScan (left), fish show up as dots with no tails.

As seen in this zoomed StructureScan return (same as above), the side-viewer also creates “shadows” beyond fish, since the transducer is sending sound out and the sound is being blocked by the fish, resulting in less sound being returned to the transducer. Strong sound coming back, or an echo, is displayed brighter than weaker sound, so the areas blocked by the fish (the shadows) are darker and the fish are brighter. The same principle applies to a flashlight creating shadows.

Side-View Fish



The side-viewer shows fish to the side as oblong shapes. Since the sonar signal is sent

to the side, the length of the fish displayed depends on the speed of the boat and direction the fish is swimming, if it even is swimming. If the fish is swimming south and you are traveling north, the side-viewer sees the fish in the cone for a shorter time, and you will get a shorter oblong shape; vice versa if it is swimming in the same direction.

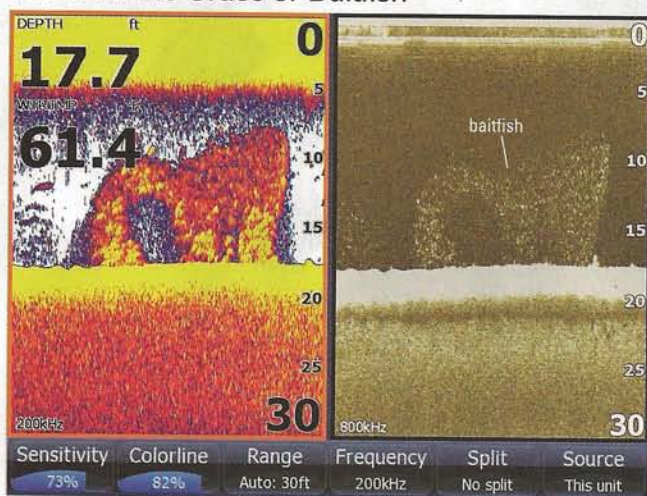
Side-View Shadows



Part 3: Deciphering Images with DownScan

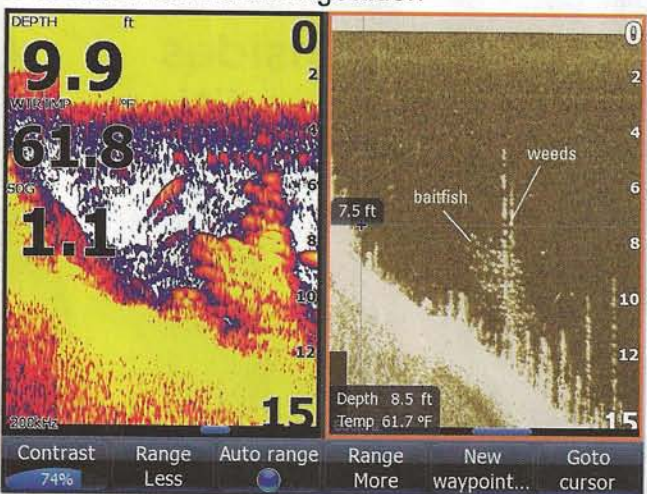
What follows is a series of tutorials on DownScan. For comparison purposes, we also show some of the same targets as they appear on the screen of a traditional sonar unit.

1. Determine Grass or Baitfish



Traditional sonar images get cluttered around aquatic vegetation, and it's difficult to tell if what you're seeing is weeds, baitfish schools or both. The definition of DownScan images reveals the truth. The image on the right, captured with DownScan, shows that the "blob" in the center of the traditional sonar screen is obviously bait.

2. Locate Fish within Vegetation



Fishing tip: Use this DownScan feature to determine not only where walleyes are holding, but what types of aquatic vegetation they prefer or the types of weeds that their forage prefers. You can then look for that type of weeds in other areas to establish a pattern.

DownScan can separate fish from aquatic vegetation, making weeds look like weeds and fish look like dots, even when they are mixed together. This example shows a bait school mixed in with aquatic vegetation.

DownScan has better target separation of fish close to the bottom than traditional sonar. It helps you identify objects you might otherwise overlook with traditional sonar. In this image, you can see a fish located tight to bottom on an otherwise featureless spot on both types of sonar.

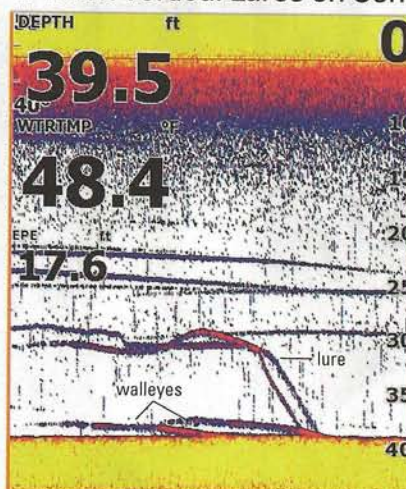
3. Locate Fish in Trees



Fishing tip: Move the cursor over the productive trees and create a waypoint. Then cast to them, or if the walleyes aren't spooky, fish vertically for them.

Sonar units with DownScan are the best tools to find standing timber in reservoirs, and more importantly, to determine the best trees to target. In this image the trees are in 20 feet of water, and the tops of the trees are about 14 feet under the surface. It's obvious which tree will be productive, as it's possible to see the fish suspended in the tree on the far left.

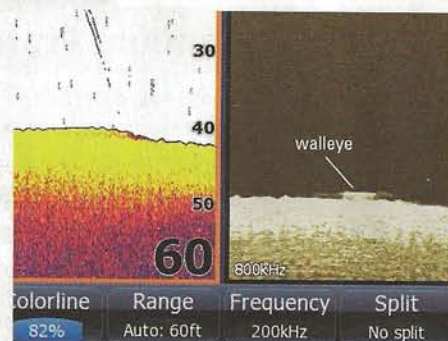
4. Track Vertical Lures on Sonar



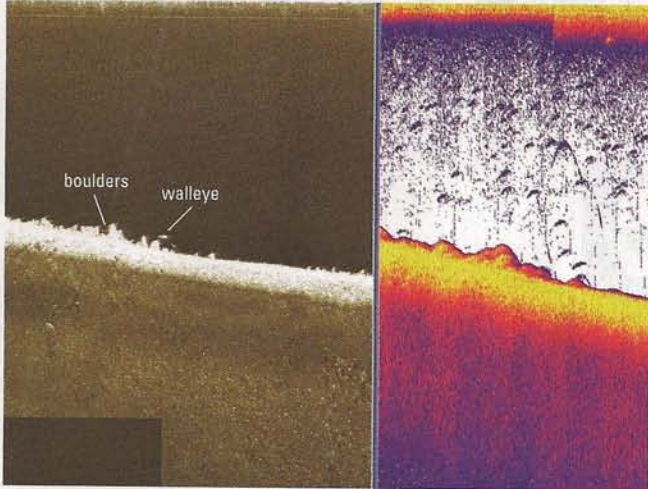
Fishing tip: If you want to see a vertical presentation on the sonar, you must have the lure almost directly under the transducer. It's best to practice this on a calm day using the transducer on the bow trolling motor. In order to see it on the sonar, raise and lower the lure until you understand where it is in relationship to the transducer.

Although DownScan can be a useful tool in certain situations, it is not best for fishing vertical presentations where you want to see your lure. The cone on DownScan is too narrow to "pick up" the lure; however, traditional sonar will give you a great image of it. This image displays a sinker and minnow at 30 feet and small fish at 39 feet.

5. Enhanced Target Separation on Bottom

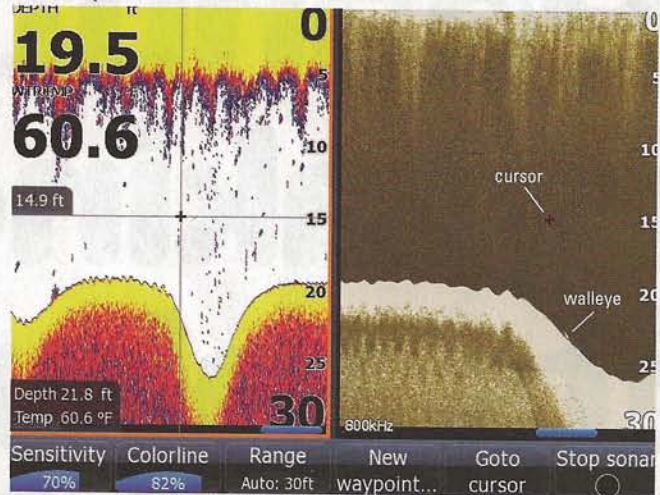


6. Enhanced Target Separation on Boulders



Walleyes can suspend or be located tight to boulders or other individual pieces of cover. With traditional sonar, some types of rocky cover can produce a similar return as fish tight to bottom. DownScan will separate the fish from the boulders better than traditional sonar. Here you can see individual fish on DownScan that blend into the boulders if viewed with traditional sonar. Traditional sonar, however, is a good tool to locate the boulders initially.

7. Drop-Off Fish

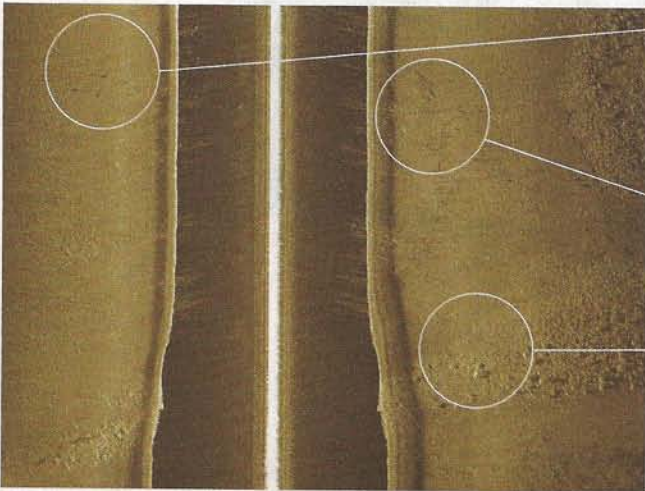


Walleyes located on drop-offs are difficult to see with sonar. The wider cone of the traditional sonar unit displays the drop-off edge in the circular cone and hides the fish. Because of DownScan's narrower cone, anglers should use it to see more walleyes. This screenshot displays a fish as a white dot on DownScan, and the traditional sonar shows no fish. The cross-shaped cursor is in the same place on both screens. The sonar display shows a sharper drop-off because it's set as a slower chart speed.

Part 4: Deciphering Structure Using StructureScan

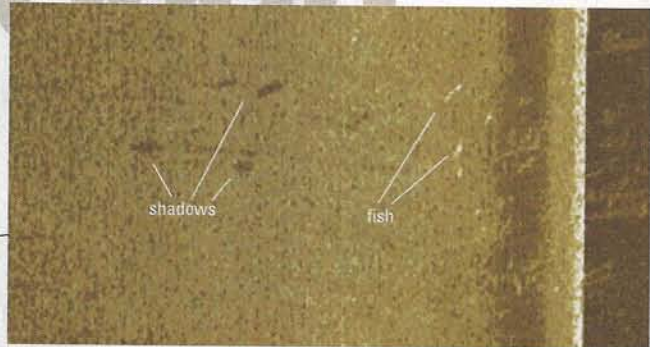
StructureScan is a great tool for finding the subtle details of large structures that you might already have located with traditional sonar and mapping technology. This StructureScan image and series of zoomed-in details have many examples of possible fish locations based on structure. It serves as a guide for identifying objects with StructureScan and offers a glimpse at the unit's capability to break down a large area.

The Structure

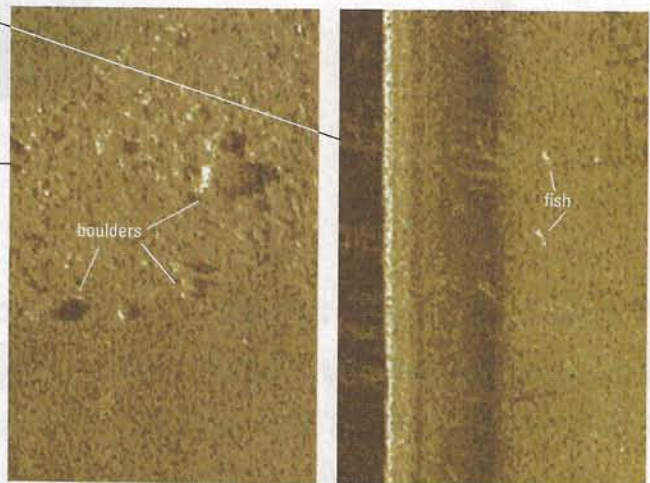


The right side of this return has a rock-strewn shoreline with a rocky point extending to the left. On the tip of the point, the biggest boulders and inside cut all look good. Trees can be seen in the water column, and white dots are fish in the trees. Black dots are shadows of the fish. The depth of the water is 20 feet.

Close-Ups Reveal the Details



This zoomed-in image shows the shadows of fish in the timber.



Notice the larger boulders near the tip of the rocky point.

The white dots to the right are walleyes in the trees.

Part 5: StructureScan Reviews

Reviewing images captured with HDS units can be done one of two ways: reviewing a simulation of the returns like a "video," or by capturing screen shots. Here is how to do both:

StructureScan Simulation

The HDS allows users to record the chart as if it were a movie. Anglers can play it back on the HDS using the Simulator feature.

To record a chart, press: MENU – Log – Record.

Lowrance recommends recording to a memory card because the HDS internal memory is limited. To do so, select "Save to" and change to memory card. Select "Log all Channels" to record both StructureScan and sonar data.

GPS data is recorded along with the StructureScan images, so if you want to review the data use the Chart-StructureScan split screen. This will show you what you passed over and where you passed over it.

To find the Simulator, press: MENU – MENU – Simulator – Enter.

You must then select "Advanced" to select the chart you want to replay from Sonar in Source Files.

Capturing Images

Images like those used in this article are easily obtained with the Lowrance HDS unit. I recommend saving images as a learning tool, so you can return to review them later. You can even e-mail the image to me for my opinion on sonar and StructureScan interpretation. I can be contacted via hightech-fishing.com.

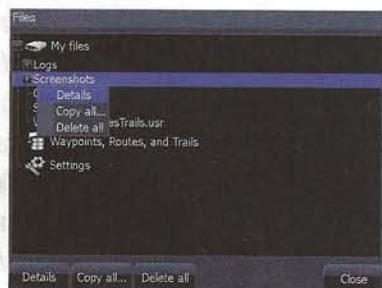
The easiest way to save an image is through the Screen Capture method. Follow this sequence to activate the screen capture: MENU – MENU – System – Screen Capture – Enter.

When you find something interesting, quickly press the Power button to capture the image on the display. If an interesting image was on the screen and disappeared, you can look back for it in memory by pressing the left arrow button, stopping when you see the image you wanted and pressing the Power button to capture it.

The screen capture images are saved in the "My Files" section of utilities. Place a blank SD memory card in the card slot and follow this sequence to save the screen captures to a card: Page – use the arrow buttons to find Utilities – Files – My Files – Screenshots – MENU – Copy All – select your memory card to transfer them.

The files are saved as .png files, which are like .jpeg files that will open on your computer for review.

Remember, you must go back and unselect the screen capture that you selected before you turn off the Lowrance HDS unit. If you don't, when you press the Power button to turn off the HDS, you will keep taking screen shots.

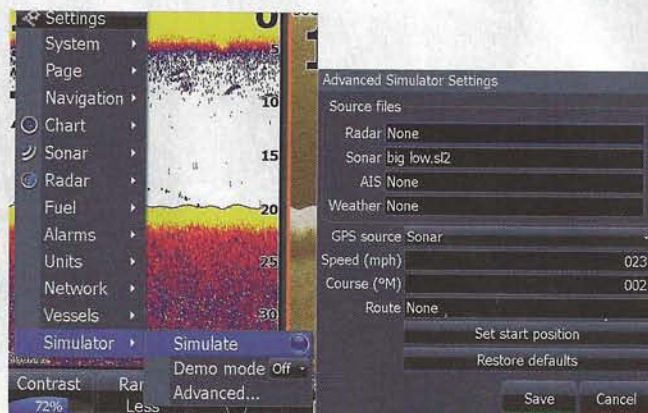


This screen shot shows the author saving his screen captures to an SD card.

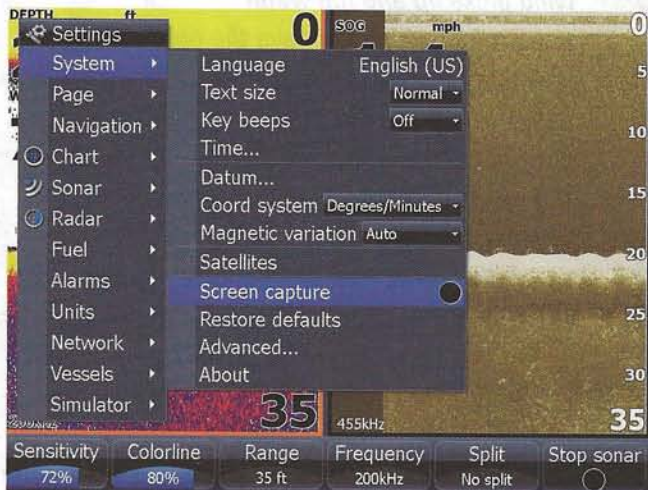


This image shows a screen capture of the menu function for recording a sonar chart simulation.

Fishing tip: When the chart is played back in the Simulator, you can create waypoints on any structure or fish for later use. It's a good idea to place waypoints on fish because fish are not lost; they are there for a reason and will repeat their location depending on the season.



These screen captures show the menu steps taken to locate the Simulator function and replay your chosen recording.



This screen shot shows the menu option for creating a screen capture.

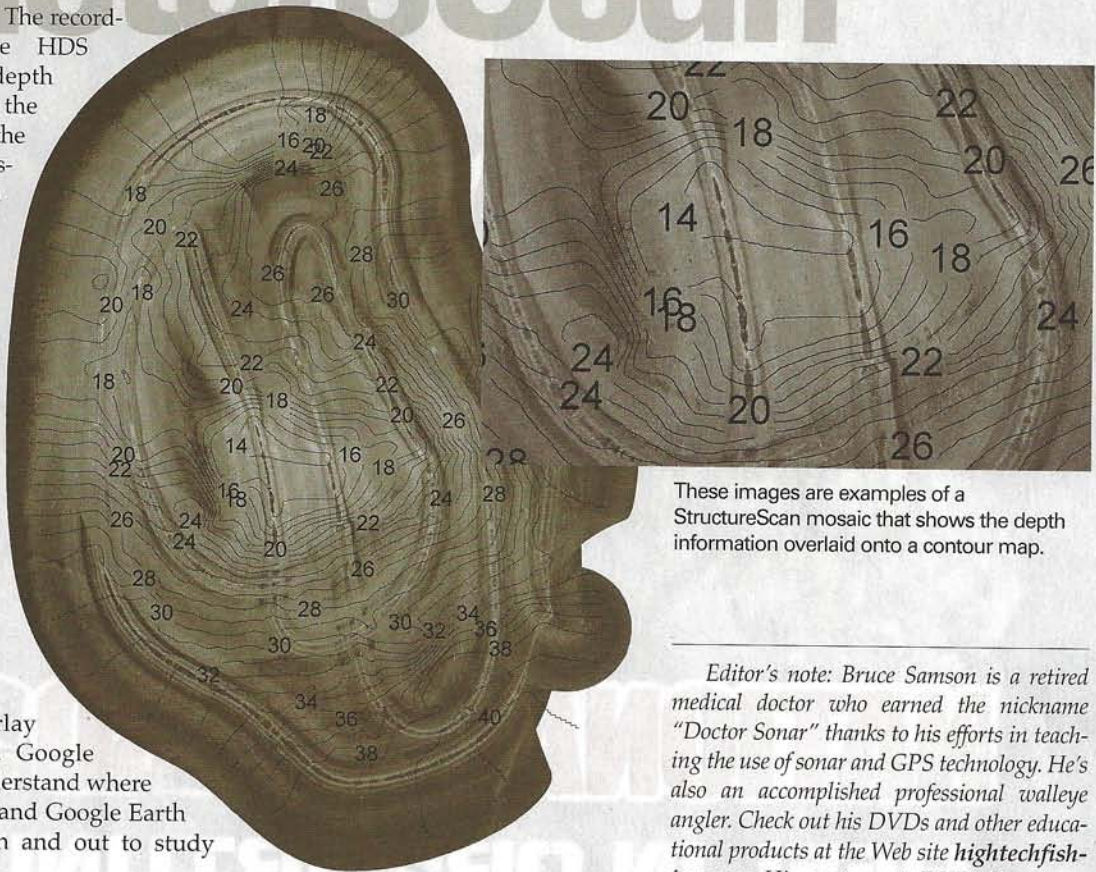
Other Forms of StructureScan Review

Only a few anglers will use this technology, but if you want to be a successful angler and catch more fish this is one way to do it. The recorded charts from the HDS StructureScan have depth data, GPS data and the StructureScan data in the file. This data can be displayed as a mosaic on the computer, meaning the side-view image is displayed as a trail just like the path you took to record the image, by using the DrDepth program available at hightechfishing.com.

You can look at what you passed over on the water, create waypoints on interesting structures and transfer the waypoints to your HDS unit.

You can also overlay the mosaic image on Google Earth. This helps to understand where the mosaic came from, and Google Earth allows you to zoom in and out to study details.

More information is available on this process at my Web site, hightechfishing.com.



These images are examples of a StructureScan mosaic that shows the depth information overlaid onto a contour map.

Editor's note: Bruce Samson is a retired medical doctor who earned the nickname "Doctor Sonar" thanks to his efforts in teaching the use of sonar and GPS technology. He's also an accomplished professional walleye angler. Check out his DVDs and other educational products at the Web site hightechfishing.com. His most recent DVD, "Lowrance StructureScan: Understanding SideScan and DownScan," is now available.

Sonar Log Viewer

Lowrance provides a free software download called Sonar Log Viewer (SLV) at lowrance.com under the "Downloads" tab.

This software will replay sonar recordings. Simply copy the .sl2 files off the SD card to a file on your computer and the SLV will open them. The .sl2 file contains information for the DownScan, StructureScan and traditional sonar. You can view them one at a time or use a split screen and see all three.

The SLV has controls for fast-forward, forward, pause, reverse, fast-reverse and many other features. It's a great tool to learn how to interpret StructureScan information at home.



These screen captures of the Sonar Log Viewer offer a glimpse at the sonar review possibilities of the free program.