Mountain Pass 11823 (Elevation of Pass)

Proposed use of VFR Waypoints and Checkpoints for Situational Awareness in the vicinity of Mountain Passes.

<u>Concept:</u> Aviation safety can be enhanced for pilots flying through major mountain passes by the addition of chart elements to improve situational awareness when operating in areas of confined terrain. The use of a combined VFR Waypoint/Checkpoint will help pilots ensure they are in the properly identified location prior to entering confined terrain. Use VFR Checkpoints once in confined terrain will improve pilots' situational awareness as they navigate to or away from the pass and as an aid to making position reports on local CTAF frequencies to reduce the risk of mid-air collisions.

<u>Background</u>: A **VFR Waypoint** is defined in the Aeronautical Information Manual's Pilot/Controller Glossary as "A predetermined geographical position used for route/instrument approach definition, progress reports, published VFR routes, visual reporting points or points for transitioning and/or circumnavigating controlled and/or special use airspace, that is defined relative to a VORTAC station or in terms of latitude/longitude coordinates." VFR Waypoints are used to help pilots navigate, avoid certain airspace, and identify entrance and exit points through mountainous terrain, but are not used to create mountain pass routes.

VFR Waypoints are assigned five-letter designators that are in navigational (GPS) databases. The waypoints all begin with the letters "VP" and have three additional letters. A generic VFR Waypoint is designated as a circle with four black points (see below). A VFR Waypoint may also be combined with a VFR Checkpoint, in which case the symbol shown on a chart is a magenta flag instead of the four-point circle.

A **VFR Checkpoint** is defined in the FAA Flight Navigator's Handbook (FAA-H-80-83-18) as "A geographical reference point used for checking the position of an aircraft in flight. Normally, well defined and selected in preflight planning, a checkpoint can usually be easily identified from the air." A VFR Checkpoint is designated on a flight chart as a magenta flag and is <u>not</u> found in a GPS database.

For the purposes of improving situational awareness associated with approaches to mountain passes, the following conventions are applied:

(a) Define a collocated VFR Waypoint/Checkpoint at the start of confined terrain leading to a mountain pass, and

(b) Use VFR Checkpoints while within confined terrain, to facilitate pilot situation awareness and accuracy of traffic reports on local CTAF frequencies. These checkpoints would not be in the GPS database, to avoid being used to define a route for navigation.

(c) A further convention is to establish the collocated VFR Checkpoint/Waypoints that denote the entrance of a mountain pass using the lowest elevation feature possible (i.e. the stream or river channel itself) to avoid using features that may be obscured by clouds, and would be visible to pilots who are navigating to this point by GPS.

VFR Waypoints		VFR Checkpoints
RNAV		Underline indicates proper name of VFR Checkpoint. Pictorial STATE CAPITOL
Stand-Alone	VPXYZ	
Collocated with VFR Checkpoint	(VPXYZ)	● <u>NORTHBROOK</u> 113.0 Ch 77 OBK

From the Aeronautical Chart Users Guide

<u>How these are used by Pilots</u>: Establishing a series of Waypoints and Checkpoints associated with a mountain pass is intended to help improve situational awareness for pilots operating under Visual Flight Rules. Given past history it is important to note that the use of these features does not constitute a "route" which may be flown by flying sequentially from one point to the next.

By necessity, features distinct enough for visual reference may not be in the center of a mountain valley, and do not provide any information related to flight altitudes. Even with these visual aids, pilots will have to continue the historical practice of studying the chart to determine terrain clearance and flight altitudes needed for safe operations based on their specific aircraft type.

Descriptions of how VFR waypoints and checkpoints are being used regarding mountain pass operations should be added to the *Aeronautical Information Manual* and other relevant documents to help pilot understand this concept and avoid any confusion with an IFR-style route.

<u>Examples of Charting Symbology</u>: The following examples are provided apply this concept for three mountain passes in northern Alaska. Combined VFR Waypoint/Checkpoints are used at the initial entrance of confined terrain, and VFR Checkpoints used thereafter, as needed, to provide a framework of situational awareness.

In the examples below, the following symbols are used:

Blue Flag = Combined VFR Waypoint/Checkpoint Green Flag = VFR Checkpoint Red Star = new Mountain Pass

Example 1: Anaktuvuk Pass with proposed VFR Waypoints/Checkpoints, and a VFR Checkpoint:



The blue flags represent combined VFR Waypoints/Checkpoints. Timber Creek is used as a landmark to ensure entrance in the appropriate valley to enter the pass. VFR Checkpoints at Threetime Mountain, the Crevice Creek airstrip and Hunt Fork Lake provide situational awareness for navigation and reference points for issuing position reports on the local CTAF frequency. The Hunt Fork Lake is often used as a drop off point for people who take float trips on the John River.

Example 2: Itkillik Pass:



VFR Waypoints/Checkpoints at Squaw Rapids on the south side and Itkillik Lake on the north side are marked for identification of pass entrances. The pass itself will need to be added to the charts. Two VFR Checkpoints are provided for situational awareness on the south side of the divide. An additional complexity of this case is the lack of a formal USGS placename for the actual mountain pass. A separate effort will be undertaken to address that issue. Itkillik (the name of the river flowing north from the pass) is used here as a provisional name.

Example 3: Carter Pass



Spring Creek, on the south end of this traverse, uses the convention of offsetting the checkpoint upstream above the confluence in order to clearly denote which drainage is the named feature.

In addition to the map views above, the following two oblique images from Google Earth give an idea of the pilot's view, headed upstream, at the locations identified by blue arrows.

Carter Pass Traverse

View northbound headed toward Carter Pass

Instead of placing the VFR Waypoint/Checkpoint flag at the confluence, leaving the potential for ambiguity as to which drainage is Spring Creek, the flag is offset slightly upstream on the labelled drainage.

Upstream view on the Marsh Fork of the Canning River:

This VFR Checkpoint may need to be officially named, as the stream appears to be unnamed on USGS topographic charts, at this time. Upper Marsh Fork is used as a placeholder name to describe its position in the drainage.

<u>Implementation</u>: The use of VFR Waypoints and Checkpoints is only anticipated for major flight corridors connecting significant regions. Defining checkpoints on flight charts may also be accompanied by descriptions in the Notices Section of Aeronautical Chart Supplements, such as was done for Lake Clark Pass in Alaska. The supplemental information included checkpoints along with the appropriate CTAF frequency and location of features such as weather cameras is intended to provide an overview of the pass to support pilots planning to fly through this crossing of the Alaska Range between southcentral and southwest Alaska.

To determine which mountain passes in a region need to have checkpoints defined, a group comprised of industry association representatives, air taxi operators and other pilots familiar with the area along with representatives from FAA Safety Team (FAAST) should be established to identify the passes that need this level of detail, and the locations of checkpoints required. The resulting recommendation would be supplied to the appropriate FAA Air Traffic Service Area, Operations Support Group for conveyance to FAA Charting.

Candidate list of documents that might be revised to include reference to use of waypoints associated with mountain passes:

Aeronautical Chart User's Guide

Aeronautical Information Manual

Airplane Flying Handbook (FAA-H-8083-3B)

Aviation Instructor's Handbook

Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25B)

Tips on Mountain Flying

References:

Aeronautical Chart User's Guide

VFR Waypoints Overview. 2008, AOPA. Retrieved from <u>https://www.aopa.org/news-and-media/all-news/2008/february/28/vfr-waypoints-overview</u>

Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25B) Chapter 16, Navigation

Aeronautical Information Manual 1-1-17 b. 1. (e) VFR Waypoints