Pan American Shorebird Program
Shorebird Marking Protocol

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Cover Photo: Dunlin (*Calidris alpina*)
Credit: Slade Sapora, USFWS

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INTRODUCTION

The Pan American Shorebird Program (PASP) was created in the mid-1980s as a standardized method for marking and identifying individual shorebirds in the field and to facilitate identification of the origin of banding. Prior to the PASP, it was extremely difficult to identify who had banded a shorebird and in which country it had been banded. The program has led to increased reporting of marked birds to researchers; as such, PASP has supported researchers to better understand shorebird movements and migration within the Western Hemisphere.

PASP assigned each country in the Americas a different colour flag or combination of flags to represent the country of banding origin. For example, Canada was originally assigned a white flag and French Guiana was assigned a light green flag over a dark blue flag. Within each country, unique or cohort colour band combinations were coordinated and assigned to specific researchers so that individuals or cohorts could be identified in the field.

While the PASP was successful for many years, challenges emerged. A two-flag system is not appropriate for some species, in particular smaller sized shorebirds. Many shorebird species considered part of the PASP system do not require broad international coordination. And, though plain colour flags are still being used, many more researchers in the Western Hemisphere are interested in using alphanumeric engraved flags, which has become a standard method for marking individual shorebirds internationally.

Incorporating consultation throughout the Western Hemisphere in 2013, an ad hoc PASP committee revised the shorebird marking protocol based on a regional assignment of new and previously-used colours for flags and bands, and on a specific set of field-readable characters for engraved colour flags. This allows for an adaptive one-flag system to be used across the Western Hemisphere. Smaller countries are grouped together into regions and share one regional colour flag while having the option to use a specific colour band to represent the country within the region. For example, Canada retains its white flag assignment (no country band) whereas French Guiana is now assigned a dark blue band over a black flag (for country and region respectively). See Appendix A for the revised list of PASP flag and band colours.

The revised protocol encourages shorebird researchers to use the PASP-assigned coloured flags and bands so that the region and country of banding origin are easily identifiable in the field. If engraved, flags are to be used. It is strongly recommended that regional colour flags be engraved using a specific set of field-readable characters to identify individual birds and allow for international resightings. Engraved colour flags can effectively reduce reporting error of observed birds and increase the number of recoveries (Meissner & Bzoma, 2011). PASP also provides recommendations for resightings and reporting of resighting data. This provides a standardized collaborative protocol that allows researchers to maximize their banding and resighting efforts and collect resighting data from throughout the study species' range, while promoting standards and best practices for marking, resighting and reporting.

The PASP shorebird marking protocol is intended to be a flexible framework for coordination of shorebird marking throughout the Western Hemisphere, where regions determine the best way to ensure that codes are not duplicated within their region. It is a reflection of the current situation with regards to marking shorebirds and thus is subject to revision when necessary.

The Importance of a Coordinated Marking Protocol for the Western Hemisphere

Marking birds with field readable markers provides a specialized, cost-effective scientific tool that allows for individual recognition of shorebirds throughout their range, through either uniquely engraved flags or a combination of flag and colour bands. This reduces the need for recapture while allowing accurate resighting from a distance with minimal disturbance to birds.

A coordinated and collaborative hemisphere-wide marking protocol, which uses coded flags and colour bands, has many benefits:

- Promotes best practices in marking and minimizes risks to birds;
- Standardizes a marking protocol for shorebirds throughout their ranges;
- Ensures uniqueness of individual markers;
- Facilitates field resighting and data reporting back to the researcher;
- Increases reliability of and provides confidence in resighting data throughout a species range;
- Promotes high standards of data quality;
- Elevates scientific integrity of results;
- Promotes collaboration;
- Maximizes the use of marker colours and codes and allows room for new researchers to participate;
- Adds credibility to projects and associated conservation activities.

To ensure the success of this hemisphere-wide protocol, it is important that researchers do not add, remove or exchange flags or bands on recaptured birds from other projects without prior agreement. Tampering with existing markers can cause interference with other studies, impacting the data, results, and effort of other researchers. Keep in mind that if a marker is broken or faded or causing injury to the bird, you should remove the marker and report changes to your Regional Coordinator and/or banding program (Appendix G).

Program Objectives

The overall objective of the Pan American Shorebird Program is to ensure reliable identification and resighting reporting of individually marked shorebirds throughout their range in the Western Hemisphere. A standardized engraved-colour marking protocol, administered through a collaborative network of Regional and Species Coordinators, national banding programs and researchers is outlined to achieve this. Specific objectives of the Program include:

1) Provide a flexible framework for collaborative coordination and communication for the use of engraved colour flags and plain colour bands for marking individual shorebirds in the Western Hemisphere;
2) Maintain a list of shorebird species that are included in the PASP shorebird marking protocol and outline the level of coordination required within the Western Hemisphere (or elsewhere as needed);
3) Develop standards, guidelines and recommendations that allow for regional differences in administration of the protocol;
4) Provide recommendations for researchers and the public on resighting shorebirds in the Western Hemisphere;
5) Encourage the development of a resightings reporting system for the Western Hemisphere; and
6) Develop and maintain a website that provides direct contact information for PASP participants (banding programs, regional coordinators, and species coordinators).

Participation

To ensure coordination across all regions, the PASP shorebird marking protocol should be followed by everyone marking migratory shorebird species in the Western Hemisphere. If you are not marking migratory species and/or do not require international resighting data for your study, other marking protocols can be followed upon consultation with your Regional or Species Coordinator.

This protocol does not necessarily replace your existing protocol or the original PASP protocol if those are already well-coordinated in your region. However, if you wish to mark shorebirds with individual, field-readable codes as part of a scientific study and require data from international resightings you are encouraged to follow the PASP marking protocol. In doing so, your marked birds could contribute to the larger goal of species conservation by providing international resighting data when resighted outside of the study area and after the period of study has ended.

Contact your Regional or Species Coordinator to find out how to participate (see Appendix G).

Justification for resighting study before marking

Due to the number of individually marked shorebirds of several species in the Western Hemisphere, new projects may wish to consider conducting a resighting pilot study to determine if a marked population is present. If there are sufficient numbers of previously marked birds, researchers may wish to minimize effort in marking more birds unless project objectives require morphometric data.

Benefits of starting with a pilot resighting study include a better understanding of local bird populations, movements, behaviours and site locations as well as discovering if there are any marked birds coming to your local study area. A resighting study may be done with fewer resources, field staff and training and it may suggest partners and collaborators. Refer to the Resighting Protocol section of this document for more information.

Data Sharing

As important as it is to mark shorebirds for species conservation and monitoring, sharing marking data is vital to promoting high standards of data quality, increasing reliability of data throughout a species range, and fostering international collaboration. **However, researchers that are marking shorebirds have a prior right to analysis and publication of data resulting from their efforts.** To protect the interests of these researchers, this protocol recommends obtaining prior permission from researchers to use their marking data.

MARKING PROTOCOL

The PASP recommends following a standard method for capturing and marking shorebirds. Researchers can refer to *The North American Banders' Manual for banding shorebirds (Charadriiformes, suborder Charadrii)* (Gratto-Trevor, 2004) for guidance. It is available for download in English, French and Spanish on the North American Banding Council website at www.nabanding.net.

The revised PASP protocol is based on regional assignment of a single flag colour, thereby minimizing the risk of marking of smaller species that cannot safely wear two flags, promoting scientific integrity of results and reducing resighting errors in the field.

- The Western Hemisphere is divided into 10 regions, with smaller countries grouped together into regions while larger countries constitute regions in and of themselves;

- Each of the 10 regions is assigned a unique flag colour;
- Each country within a region is assigned a unique band colour; and
- Coloured flags are engraved with a three-character code using a specific set of 29 field-readable characters.

Colour flags and bands

The coloured flag identifies the region of banding and coupled with the assigned country colour band, the country of banding can quickly be determined at a distance in the field (Appendix A).

For optimal visibility, the engraved regional flag is placed above the tarsometatarsal joint (upper leg), with the optional country band placed above the flag (Figure 1). While there remains the potential for error associated with the use of engraved flags and colour combinations, the metal band is a unique identifier for marked birds. This protocol recommends the use of hard metal bands (stainless steel or incoloy) on shorebirds, which should be placed on the lower leg. If aluminum bands are used on shorebirds, they should always be placed on the upper leg. Birds may also be marked with colour bands on the lower leg to indicate other information relevant to the study such as age cohort or study site.

However, multiple bands on the lower leg may in some cases increase the risk to bird welfare if there is excess friction from wading through water and mud. Keep in mind that some flags may also break in cold weather. The PASP recommends that you use the minimum number of markers on birds required to most effectively conduct your study.

Consult your Regional or Species Coordinator for guidance on which marking scheme to use for your study (see Appendix G).

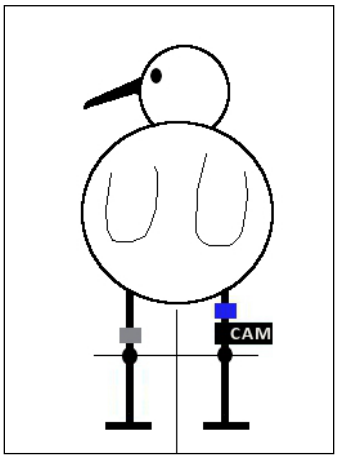


Figure 1.Example of PASP colour marked bird as seen from behind: the colour band above the engraved colour flag on the upper leg indicates French Guiana as the banding origin. The federal metal band (opposite leg) provides a unique identifier.

The PASP protocol uses coloured leg flags and bands made of an impact-resistant plastic that is available in UV-stable colours to reduce incidence of breakage and fading over time (e.g. Salbex, Darvic equivalent or PolyMethyl MethAcrylate (PMMA)). When closing and sealing flags it is important not to use too much glue. Excess glue can potentially affect the bird and it can smear the codes on the flag. Heat sealing using a small soldering iron may also be used and is the preferred method for some. For instructions on how to make flags, refer to the flag making section below and Clark *et al.* (2005).

Flag codes

If using coded flags, the PASP protocol recommends that colour flags be engraved with a three character code using only the following 29 sans-serif characters:

15 letters: **A C E H J K L M N P T U V X Y** (in Arial font)
10 numbers: **1 2 3 4 5 6 7 8 9 0** (in Century Gothic font)
4 optional symbols: **+ =** @ **%** (in Arial font)

The exclusive use of this 29 sans-serif character set increases the reliability of resightings by minimizing reading errors in the field (Clark *et al.*, 2005). Since the unique three character code on engraved flags provides a field readable marker that identifies individual birds during resighting efforts, it is critical that a clear font be used for the code. Font, font size, character spacing and protocol characters need to be strictly adhered to in order to get accurate readings in the field. It is also notable that deeper engravings may collect mud and affect readability.

This set of 15 letters, 10 numbers and 4 optional symbols allows for 24,389 individual birds per species or band size to be marked with a unique three-character code per region. Although each region is sharing this pool of over 24,000 codes for their engraved colour flags, regional options may be developed in consultation with Regional Coordinators.

Regional Options

It is important to understand that the regional flag colour and the individual flag code together identify the individual bird of a particular species within a region and thus the researcher or program that marked the bird. A country colour band is an extra, optional marker that may or may not be used depending on regional and researcher preference. The use of the colour band provides additional information in the field about where a particular bird was banded and thus who the bander may be. That the colour band may or may not be reported with the flag and code by observers is important to consider when deciding to use an optional colour band.

For regions made up of a single country, colour bands may be used to indicate age or location cohorts. Again this is ancillary to the flag colour and code assignment.

To further assist in researcher or project recognition, some regions may consider assigning specific characters to specific researchers. For example, within a specific region Researcher A agrees to use Alpha-Alpha-Alpha codes, Researcher B agrees to use Num-Alpha-Num, Researcher C agrees to use Num-Num-Num codes and Researcher D will begin all codes with "+".

A researcher may decide to use a different colour of ink for the engraving to further identify a particular project. While this is an option, it should not be considered unique. The regional colour flag with the unique code remains the identifier regardless of engraving colour. If code colour does factor into the protocol it is important to consider that colours may fade, debris may adhere to the flag, staining or other conditions may affect the readability and reliability of distinguishing the engraving colour. Again, engraving colour may or may not be reported with the flag colour and code by observers. For guidance on inking engraved flags, refer to Clark *et al*. (2005) and below in the *Flag making* section.

A marking study may use a different flag colour than assigned if codes are running out for that regional flag colour for a particular species. However, this will require consultation and the agreement of other regions and coordination of codes.

For species that do not occur in some regions, or that have subpopulations in different regions that do not intermingle (see the species list in Appendix B-F) other regional flag colours may be assigned to some researchers.

For example, since the Magellanic Plover is only native to Argentina and Chile, researchers could use any other flag colour that does not belong to an adjacent region. Similarly for Snowy Plover; the North American populations do not interact with the resident Neotropical sub-population in Ecuador, Peru and Chile.

All regional options must be developed in consultation with Regional Coordinators who will ensure coordination and agreement with other regions (Appendix G). Codes should only be duplicated in exceptional circumstances.

Species Included in the PASP Shorebird Marking Protocol

All shorebird species occurring in the Western Hemisphere are included in the PASP shorebird marking protocol. These species were identified based on their distribution by country using data from the BirdLife International website (www.birdlife.org) and verified by researchers involved with marking shorebirds in the Western Hemisphere. Where species occur in a country, they were further identified as breeding, non-breeding, passing or vagrant, whenever these details were available. The resultant 83 species were then grouped according to the level of coordination required:

- 30 species require coordination across the Western Hemisphere (Appendix B)
- 14 species require coordination within North America only (Appendix C)
- 29 species require coordination within South America only (Appendix D)
- 10 species require coordination with international flyways (Appendix F)

Species occurring in Central America and the Caribbean are listed in either Appendices C or D depending on their range. Species not included in the PASP shorebird marking protocol are listed in Appendix E.

These species lists provide a basis for the level of coordination required to ensure the success of the PASP in offering a means to collect and share high quality resight data amongst shorebird researchers.

FLAG MAKING

Sources for flag material

This is a working list of known flag material suppliers (UV-stable plastic, Salbex or other Darvic equivalent like Ultragrave or Salgrave). Darvic is no longer manufactured and any remaining stock is difficult to source and only available in limited colours.

Haggie Engraving

This company can source material from UK, has some material available and can engrave flat flags. For large orders, you will need to form your own flags.

Contact: Robin Haggie
Address: PO Box 66, Crumpton, MD 21628, USA
Email: haggie@intercom.net
Phone n°: +1.410.928.5228

Interrex

This company can provide flags of most colours, engraved and formed. There was difficulty in contacting this provider and confirming that orders will be supplied when needed. However, the key is to order the flags in plenty of time before you want to deploy them (e.g. more than a couple of weeks ahead, think a few months ahead) as others may have put orders in at the same time.

Contact: Marcin Faber
Website: http://www.colour-rings.eu/
Email: info@colour-rings.eu

Pro-Touch Engraving and Signage

Currently working on producing flags; samples produced December 2015. A small order is being placed to test the product in 2016.

Contact: Bonnie Moran
Address: 2605 Faithfull Ave, Saskatoon, SK S7K 5W2, Canada
Website: http://www.protouch.ca/
Phone n°: +1.306.975.3757
Email: sales@protouch.ca

Red Bird Products, Inc.

Currently working on producing flags; samples produced in March 2016. A small order is being placed to test the product in 2016.

Contact: Tony & DiAnn Watley
Address: Red Bird Products, Inc.
PO Box 376, Mount Aukumn, CA 95656-0376 USA
Website: http://www.redbirdproducts.com/contact.html
Phone n°: +1.530.620.7440
Email: redbird@directcon.net

Ultra-grave

Trademark of Rowmark, LLC

Ultra-grave is a UV-stable laminate engraving material with properties very similar to Darvic/Salbex. The material has not yet been tested for bird flags.

Address: 2040 Industrial Drive
Findlay, OH 45839
Website: www.ultra-grave.com
Phone n°: 1+800.243.3339
Email: info@rowmark.com

Tom Rings

They can do flags as well as bands and collars. They have not been used before but could be worth investigating.

Address: Ul. Rojna 37/21
91-134 Lodz
Poland

Website: bird-colour-rings.com
Email: office@bird-colour-rings.com

If you are aware of other sources of flags or materials please let your Regional Coordinator or the PASP Coordinator know so that we may keep this section up to date.

Materials and flag dimensions

For small and medium species, flags should be made of 0.5 mm thick UV stable plastic (e.g., Salbex or other Darvic equivalent). For larger species, the thickness should be 1.0mm or 1.5mm, to reduce cracking of flags. To make the flags readable, the spacing between the letters should be as large as possible and there should be a **1-2 mm gap between the top and bottom of the characters and the edge of the flag**. This makes them easier to read and allows a margin for abrasion. Longer flags may rotate on the leg causing irritation to the bird, shown as continually flicking and twitching of the leg bearing the flag.

The length of the lettered part of the flag and the height of the flag is adjusted to maximise character-size without making the flag too long. **Each letter should be given the same amount of space on the flag to maximize readability.** Take the width of the widest letter (W or M) and use the space it takes up on the flag as the minimum space for each letter, with space between these "character boxes". Centre each letter within this space. The lettering is copied on both sides of the flag. Example measurements are shown in Tables 1 and 2. **The font has to be one without serif, for example Arial, or Gothic.**

Table 1. Flat flag dimensions

USGS Band Size	Internal Diameter (mm)	Flag Height by Length (mm)	Font Size
1B	2.77	6 x 34	14
1A	3.18	6 x 36	14
2	3.96	7 x 43	17
3	4.78	7 x 46	17
3B	5.16	8.5 x 47	20
3A	5.56	9 x 49	20
4	6.35	12 x 61	23

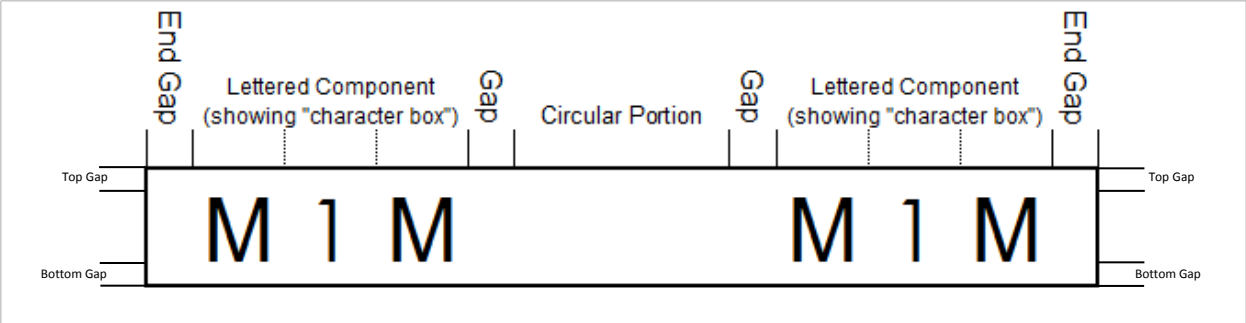


Figure 2. Sample of flat flag showing locations of component measurements in Table 2 ***(not to scale).***

Table 2. Measurements for flat flag shown in Figure 1, according to USGS band size.

USGS Band Size	End Gap (mm)	Lettered Component (mm)	Gap (mm)	Circular Portion (mm)	Top/Bottom Gap (mm)
1B	1	10.2	1.5	8.7	1
1A	1	10.5	1.5	10	1
2	1	12.3	2	12.4	1
3	1	12.3	2	15	1
3B	1	12.3	2	16.2	1
3A	1	12.3	2	17.5	1
4	1	16.3	3	19.9	2

Engraving

Engravers who have the capacity to undertake flat-bed laser writing linked to a computer can make whole sheets of flags. But, note that some material noted above cannot be engraved with a laser. In this case, traditional engraving is used (e.g., router cut). Engraving by hand, though possible, is not recommended as it is difficult to reproduce letters in a font that is clear enough for reading in the field.

Either you or the engraver will need to provide a file with the flat flags as you wish them to be engraved. This file contains a grid marking the outline of each flag plus all the pairs of inscriptions. The codes should be engraved deep enough to paint-fill with Gravograph Engravers enamel, or similar engravers enamel. The flags can be marked out with lines cut most of the way through the material. It is then easy to fold the material along these lines and separate out the individual flags. Note that the flag is weakest at the engraved part. Be careful not to break the flags when separating them.

Note: If a micro-drill has been used it is difficult to remove the bits still attached to the edges. A problem with the mechanical engraving (and/or micro-drill) is in the letter A for example, the little triangle in the middle of the letter sometime disappears.

Paint-filling

If two sheets of different colour (e.g. white and black) laminate materials (e.g., Salbex, Ultragrave, Salgrave) are fused together, they do not necessarily require paint-filling. Engraving removes the "upper" colour and exposes "lower" colour (e.g., removes the white, leaving the black exposed). This may be superior to paint-filling as there is no paint to erode/fade over time.

As noted above, paint-fill with engravers enamel like *Gravograph*[1] or *Engravers Depot Inc*[2]. This can typically be completed by the company engraving your flags. If you plan to paint the flags yourself, it has to be done on the whole sheet before separating the flags:

[1] Gravograph, Gravotech Inc., 2014. Page consultée le 5 janvier 2016, [En Ligne], http://www.gravograph.us/engraving-products/Engravers_supplies.php

[2] Engravers Depot Inc., 2012. Page consultée le 5 janvier 2016, [En Ligne], http://engraversdepot.ca/Accessories-Machines-Software/engraving-supplies-3.html

1. Brush off any loose particles from the sheet and place on a smooth, flat surface.
2. Put a small amount of engravers enamel on the corner of the sheet and use a stiff rubber squeegee to spread the paint across the entire sheet, filling in the engraved areas.
3. Use enough pressure to remove the paint from the non-engraved areas, but not so much as to remove from the engraved areas.
4. After the paint dries, excess material can be removed with denatured alcohol.

Forming the flags

Flags are made up in the same way as other permanent flags (see Clark (1979), Barter (1992) and Jessop *et al.* (1998) for further reading on flag forming).

1. Use a pair of needle-nose pliers (without ridges on the inside of the plier; these leave ridged marks on the finished flag).
2. Soften the flat flag in boiling water, wrap around a rod having the same internal diameter as the flag size you intend to make.
3. Hold the extensions in pliers and reheat in hot water, and then transfer to cold water to set the flag.
4. Make sure that the ends of the flag line up; if they do not, repeat the heating process and realign the flag.
5. Any sharp corners need to be rounded. Flat clippers, or nail clippers, work very well for trimming the corners off in a neat fashion. Finish with fine sandpaper.
6. Finally, prepare a string of flags, so you have them sorted, in sequential order and oriented in the right way, making it easy to find the right size and code when you are applying them in the field (e.g. Take great care with the flags that can be read when upside down 99 could be 66 if you put it the wrong way up).

Note: Some materials have a higher softening point than 100°C (e.g. PMMA). A “hot plate” method, used by Robin Haggie involves modifying a soldering iron and fitting it with a small plate to heat the material used for making the flag. The material could then be drawn forward (towards the heated tip) and hand formed with pliers around the dowel tip of the correct flag diameter. The dowels could be of different sizes. This has proven satisfactory but still **necessitates a lot of practice**. For more information, please contact Mr. Haggie (see page 9 under Haggie Engraving).

Applying the flags in the field

1. When applying the flag, only open it enough to get around the bird’s leg. Opening too wide will warp the flag, making it difficult to keep closed.
2. Once the flag is on the correct way with the letters and numbers facing up (make sure it is before proceeding), use PVC-ABS transition cement (e.g., Oatey PVC to ABS medium white transition cement) to fuse the flag closed.
3. Place a small amount of solvent on one side of the inside of the flag (under the engraved part) using a toothpick and being very careful not to use too much. Do not get any on the bird or the outside of the flag. The solvent will smudge the ink and ruin the flag.

4. Hold the flag closed for about 30 seconds to allow the solvent to cure before continuing to process the bird.
5. Optionally, fuse a small point on the end of the flag together with a battery-powered soldering iron to prevent it from springing open while the solvent cures (it takes several hours to fully cure).
6. Have acetone or nail polish remover on-hand to unglue any fingers that may become fused.

RESIGHTING PROTOCOL

Before going into the field, observers should develop appropriate geospatial sampling frames for data collection in specific locations, and be prepared to collect data on all engraved colour flags that they encounter. The minimum data required is flag colour, engraved code, species, date, location, and sampling effort. Other data may include secondary markers and their location on the bird, flock size of each species with individual marks, tide state, weather conditions and behaviour e.g. feeding, roosting etc.

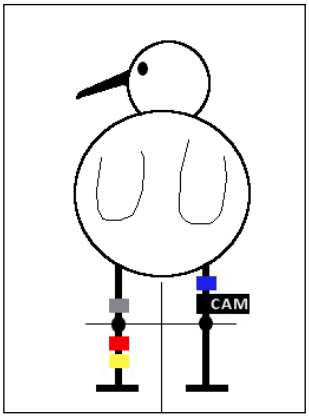
Resighting Methods

The PASP recommends following a standard method for resighting shorebirds. Several resighting protocols are available in the literature (Brown *et al.*, 2013; Buehler, Castillo & Angehr, 2004; Danemann, Carmona & Fernandez, 2002; Ferrari, Albrieu & Gandini, 2002; Rocca & Aldabe, 2012). Select the best design for your study or develop your own resighting protocol.

Recording Colour Markings

All researchers marking shorebirds in the Western Hemisphere should follow a standard format for recording colour markings in shorthand notation, to ensure greater accuracy in linking resight reports with banding data. Several methods for recording colour markings are available in the literature (Brown *et al.*, 2013; Gratto-Trevor, 2004; Myers *et al.,* 1983; Redfern & Clark, 2001; Rocca & Aldabe, 2012). Following international guidelines can increase the chances of receiving accurate international resight reports for your marked shorebirds.

The PASP recommends using the codes listed in Table 3 (below) as a standard format to use when recording color marker combinations on shorebirds in shorthand notation.



Following this standard notation, the bird depicted here can be recorded as:

m | r, y : db, FEbk(CAM) | -

Note that combinations are always read from the bird's upper left leg, to bottom left leg, to upper right leg, to bottom right leg.

Although our example illustrates a bird marked with many bands, we recommend placing a minimum number of bands on birds needed to identify them.

Table 3.Key to codes for recording colour band combinations on shorebirds.

Colour	**Code**	**Description**	**Code**
Black	bk	Separates markers on the same leg segment (comma)	,
White	w	Separates upper vs. lower leg (vertical bar; symbol above \ on keyboard)	|
Red	r	Separates left vs. right leg (colon)	:
Orange	o	Separates colours on split bands (forward slash)	/
Yellow	y		
Dark Green	dg	**Marker Type** *(where x = colour)*	**Code**
Light Green	lg	Metal Band	m
Dark Blue	db	Coloured Band	x
Light Blue	lb	Coloured Flag	Fx
Pink	lp	Bi-Coloured Flag	Fx/x
Dark Pink	dp	Tri-Coloured Flag	Fx/x/x
Purple	pu	Engraved Band *(where # = alpha or numeric code)*	Ex(###)
Brown	bn	Engraved Flag *(where # = alpha or numeric code)*	FEx(###)
Grey	gy	no bands or flags present (single dash)	-
Purple Red	pr	Geolocator	GEO
		Satellite	SAT
		unknown character on code	Q
		unknown colour or bands on particular portion or sub-portion of leg	U

Researchers may choose to record resighting data in the field using their own notation; however, this is the only format that will be accepted when submitting data (banding, recaptures, and resights) to either bandedbirds.org or reportband.gov. In all cases, researchers should communicate directly with their regional banding programs or with their Regional Coordinator to know the desired format and schedule for submitting their data.

Outside of a systematic resighting protocol, members of the public may encounter marked shorebirds. They should be encouraged to collect flag colour, code, species, date, and location and if possible any colour bands or other markers on the bird. The most efficient way to gather these resighting data by members of the public is with photographs where information can be verified. A flyer is available in English, French and Spanish to distribute to the public so that they better understand what data to collect, how to collect it and how to report it. Flyers are available in the tools section of the WHSRN website http://www.whsrn.org/.

REPORTING PROTOCOL

Reporting Code Use

Researchers who have been assigned engraved flags under this protocol should report the status of their assigned codes (e.g. unused or on-bird) back to their regional banding program or Regional/Species Coordinator at the end of each field season. This can be by submitting data in a digital spreadsheet format. For researchers who use North American bands, all marked birds should be reported to the respective banding offices using the BANDIT software. The PASP protocol is intended as a flexible framework that provides guidance for the coordination of shorebird markings; regions should decide for themselves the best method for managing their data to ensure no overlap in assigned codes.

Reporting code use is essential. If the banding data are not submitted to the regional banding programs or the Regional/Species Coordinators, then resighting reports cannot be linked with the researcher and the origin of resighted birds can be difficult to determine; in which case researchers may not receive encounter reports for their birds.

Reporting Resighted Birds

Regional/Species Coordinators can be contacted directly to help resolve encounters of colour marked shorebirds in the Western Hemisphere.

Resights can also be reported online at: www.reportband.gov (in English, French and Spanish), www.bandedbirds.org (English only) or www.avesargentinas.org.ar/aves-anilladas (Spanish only). These websites host large databases of banding, recapture and resighting data. Once a resighting report has been entered, the information is forwarded to the bander and the observer may receive details about the banding origin or where else the bird has been observed, depending on the database.

This is true only if the data are in the respective databases. Therefore researchers that have been assigned coded flags under this protocol are strongly encouraged to report the use of their codes to their regional banding program or their Regional/Species Coordinator (or directly to Banded Birds or Aves Argentinas if there are no established programs in their region).

While these websites provide a convenient means for entering resight reports, large numbers of resightings can also be reported directly using BANDIT (North American federal bands only), or by using the reporting form provided by bandedbirds.org.

It is also important that researchers report all resightings: this is crucial step in maximizing data use and developing international collaboration in shorebird studies.

What to Report

Try to include as much of the following information as possible for each marked bird, in order to produce a resight report that can significantly support the research efforts:

1. Date and time
2. Species
3. Precise location (latitude & longitude if possible)
4. Marker type (flag, colour/metal band, geolocator)
5. Colours combinations (flags & bands)
6. Alpha-numeric code (on flag or band)
7. Additional information
8. Your contact information

The most useful resighting reports include a full description of markers including codes, their position on the bird and their colour combinations. Photography should be used when appropriate as a means to

verify observations of marked birds. Refer to the sources cited in the *Resighting Section* for guidance on how to accurately record colour-marked shorebirds.

COORDINATION ROLES AND RESPONSIBILITIES

The PASP shorebird marking protocol is intended to be a flexible framework for coordination of shorebird marking in the Western Hemisphere. It is a system that complements what has already been put in place by established banding programs and regulatory authorities. In all cases related to shorebird marking, compliance with regulatory authorities takes precedence. Thus the success of the PASP as a framework that encourages reliable identification of individual shorebirds in the field and the accurate reporting of data back to researchers depends on agreement and acceptance from established regulatory authorities, in collaboration with researchers.

Within this framework:

- the PASP Steering Committee provides additional guidance to regions with regards to the colour-marking of shorebirds, by setting standards and protocols;
- Regional Coordinators and/or Species Coordinators play a critical role in coordinating the codes for individually marking shorebirds that occur in their regions, by assigning and tracking coded flags in consultation with banding programs (if established); and
- Researchers conduct monitoring studies and research.

Not all roles may be required in all regions and the regional coordination role may be fulfilled by existing banding programs, as is the case with the Bird Banding Office in Canada, the Bird Banding Laboratory in the US, CEMAVE in Brazil, and Corbidi in Peru.

PASP Steering Committee

The PASP Steering Committee is ideally made up of one representative from each of the 10 regions in the Western Hemisphere (Appendix A). This representative may be a Regional Coordinator, a Species Coordinator, a banding program manager, or a shorebird researcher. An unspecified number of at-large positions are also available for individuals interested in being actively involved. Representatives may be self-identified or nominated.

Responsibilities of the Steering Committee include:

- Providing guidance on the coordination of shorebird marking in the Western Hemisphere;
- Maintaining an up-to-date website that lists:
  - Contact information for Regional Coordinators, Species Coordinators, and Banding Program Offices across the Western Hemisphere
  - Links to other international shorebird groups
  - Links to documents associated with the PASP Shorebird Marking Protocol (checklists, code sheets, data sheets, etc);
- Assisting Regional Coordinators and Species Coordinators with international coordination of marking schemes for species occurring in international flyways;
- Attending conference calls to discuss and resolve any issues or disputes arising with the administration of the protocol or code assignment at all levels of coordination; and
- Soliciting members for the Steering Committee.

If you or someone you know would be interested in sitting on the Steering Committee, please contact the co-Chairs of the Steering Committee directly (see Appendix G).

Regional Coordinators

Researchers wishing to colour mark shorebirds should contact their regulatory authority and/or their established banding program which can advise on applicable legislation and processes for project or permit approval prior to following the PASP protocol for the colour-marking of shorebirds.
The Regional Coordination role may be fulfilled by the regulatory authority, existing banding program or another organization or individual. Ideally, there is at least one Regional Coordinator for each of the 10 colour-flag regions identified in Appendix A.

If there are currently no Regional Coordinators in your region, contact the PASP Steering Committee directly for assistance. See Appendix G for a list of PASP contacts.

Regional Coordinators work with researchers to create a coordinated marking system that avoids overlap of markers on a species of study and provides room for new banders and projects.

Responsibilities include:

- Maintaining an updated database of active shorebird banders in the region, the flag codes that have been assigned and those that are still available for their region;
- Consulting with Species Coordinators, banding program managers, researchers and others as required when administering flags colours and codes;
- Informing banding programs when researchers have been approved for marker assignment, for final approval and permit updates;
- Assisting in the identification of resighted marked shorebirds;
- Assigning or soliciting Species Coordinators;
- Reporting to the Steering Committee any issues or difficulties with administering the protocol in their region; and
- Notifying the PASP Steering Committee when they no longer wish to serve this role, and helping to identify a new Coordinator.

If you or someone you know would be interested in filling the role of Regional Coordinator, please contact the Steering Committee.

Species Coordinators

Species Coordinators may be an entirely optional role, depending on how regions decide to manage coordination and division of work within their region. For example if the role is already being filled by a Regional Coordinator or banding program or there are very few researchers marking a certain species, a species coordinator may not be required. Conversely, Species Coordinators may be required when a Regional Coordinator has not been identified. The Species Coordinator may coordinate codes for a single species within a single or multiple regions.

Since the PASP protocol is intended as a flexible framework for coordinating shorebird marking, the process may vary from one region to another: some regions may only want Species Coordinators to work within their region while others may want them to help coordinate with researchers and programs in other regions. Ideally, the Species Coordinator is a researcher who has developed an expertise by working with a specific species for many years. Responsibilities will vary by region; though they are similar to those listed for Regional Coordinators.

If you or someone you know would be interested in filling the role of Species Coordinator for your region, please contact your Regional Coordinator or the Steering Committee.

Researchers

Responsibilities include:

- Conduct ornithological studies and monitoring;
- Ensure all necessary permits are in place;
- Ensure high ethical and scientific standards are followed at all times;
- Coordinate regionally and within study species to ensure that markers remain unique;
- Use only as many codes as required to answer your research questions;
- Collaborate with others;
- Submit banding data to the banding office or appropriate authority;
- Report band sightings and recoveries;
- Only mark previously unmarked birds - never remove or alter a marker unless you have permission to do so; and
- Submit an appeal to the Steering Committee if you have a dispute with the coordinator distributing codes for engraved regional colour flags.

APPENDICES

Appendix A. Pan American Shorebird Program (PASP) Flags and Band Colours

Notes:

[1] Regions that only contain one country do not need country bands.

[2] Shorebirds banded in the US were previously marked with Light Green (Lime) flags; some of these birds can still be observed in the field.

[3] Caribbean countries listed here are those that participated in the original PASP protocol. Others can be added as required.

REGION	FLAG	COUNTRY	BAND
Canada	White	Canada	-- [1]
		St-Pierre et Miquelon	--
United States	Dark Green [2] Light Green	United States	-- [1]
Mexico	Purple Red	Mexico	-- [1]
Central America	Grey	Belize	Light Green
		Costa Rica	Black
		El Salvador	Dark Blue
		Guatemala	Orange
		Honduras	Grey
		Nicaragua	Dark Green
		Panama	White
Caribbean [3]	Pink	Bermuda	Dark Blue
		Cuba	Dark Green
		Dominican Rep.	White
		Guadeloupe	Light Green
		Haiti	Red
		Jamaica	Black
		Martinique	Orange
South America	Black	Colombia	Yellow
		French Guiana	Red
		Guyana	White
		Suriname	Light Green
		Venezuela	Black
	Yellow	Bolivia	Dark Blue
		Ecuador	Red
		Peru	Yellow
	Dark Blue	Brazil	Dark Blue
		Paraguay	Orange
	Orange	Argentina	White
		Uruguay	Dark Blue
Chile	Red	Chile	-- [1]

Appendix B. Shorebird species that require coordination across the Western Hemisphere

Common Name	*Scientific name*	Canada	USA	Mexico	Central America	Caribbean	Colombia	French Guiana	Guyana	Suriname	Venezuela	Bolivia	Ecuador	Peru	Brazil	Paraguay	Argentina	Uruguay	Chile
AMERICAN GOLDEN-PLOVER	*Pluvialis dominica*	br/pa	br	x	nb	x	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb
BAIRD'S SANDPIPER	*Calidris bairdii*	pa	br	x	nb	v	nb	nb	no	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb
BLACK-BELLIED PLOVER	*Pluvialis squatarola*	x	br	x	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb
BUFF-BREASTED SANDPIPER	*Tryngites subruficollis*	br	br	x	pa	v/pa	pa	pa	pa	pa	nb	nb	nb/pa	nb	nb	nb	nb	nb	nb
COLLARED PLOVER	*Caradrius collaris*	no	x	x	nb	nb	nb	nb	nb	nb	br	nb	nb	nb	nb	nb	nb	nb	nb
GREATER YELLOWLEGS	*Tringa melanoleuca*	pa	br	x	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb
HUDSONIAN GODWIT	*Limosa haemastica*	br/pa	br	nb	v/nb	v	nb	nb	nb	v	nb	nb	pa	nb	nb	nb	nb	nb	nb
LEAST SANDPIPER	*Calidris minutilla*	br/pa	br	x	br	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	v	nb	nb
PACIFIC GOLDEN-PLOVER	*Pluvialis fulva*	br/pa	br	x	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb
LESSER YELLOWLEGS	*Tringa flavipes*	br/pa	nb	x	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb
LONG-BILLED DOWITCHER	*Limnodromus scolopaceus*	pa	br	x	nb	nb	nb	nb	no	no	no	no	v	v	no	no	v	no	no
MARBLED GODWIT	*Limosa fedoa*	br	br	x	nb	nb	nb	nb	no	no	nb	no	v	nb	v	no	no	no	v
PECTORAL SANDPIPER	*Calidris melanotos*	br/pa	br	x	pa	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb
SEMIPALMATED PLOVER	*Charadrius semipalmatus*	br/pa	br	x	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	v	nb	nb	nb
SEMIPALMATED SANDPIPER	*Calidris pusilla*	br/pa	br	x	nb	nb	nb	nb	nb	nb	nb	no	nb	nb	nb	nb	v	nb	nb
SHORT-BILLED DOWITCHER	*Limnodromus griseus*	pa	br	x	nb	nb	nb	nb	nb	nb	nb	no	nb	nb	nb	no	v	no	v
SNOWY PLOVER*	*Charadrius nivosus*	no	x	x	x	x	x/nb	v	x/nb	no	x/nb	no	br	br	no	no	no	no	br
SOLITARY SANDPIPER	*Tringa solitaria*	x	br	x	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	v
SPOTTED SANDPIPER	*Actitis macularius*	br/pa	br	x	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb
STILT SANDPIPER	*Calidris himantopus*	pa	br	x	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	v
SURFBIRD	*Aphriza virgata*	x	br	x	nb	no	nb	no	no	no	no	no	nb	nb	no	no	nb	no	nb
UPLAND SANDPIPER	*Bartramia longicauda*	br	br	x	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb
WANDERING TATTLER	*Heteroscelus incanus*	x	br	x	nb	no	nb	no	no	no	no	no	nb	nb	no	no	no	no	v
WESTERN SANDPIPER	*Calidris mauri*	pa	br	x	nb	nb	nb	nb	nb	nb	nb	no	nb	nb	no	no	no	no	nb
WHIMBREL	*Numenius phaeopus*	pa	br	x	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	no	nb	nb	nb
WHITE-RUMPED SANDPIPER	*Calidris fuscicollis*	br/pa	br	x	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb
WILLET	*Catoptrophorus semipalmatus*	br/pa	br	x	nb	nb	nb	nb	nb	nb	nb	no	nb	nb	nb	no	nb	nb	nb
WILSON'S PHALAROPE	*Steganopus tricolor*	br/pa	br	x	nb	nb	nb	no	no	v	nb	nb	nb	nb	nb	nb	nb	nb	nb
WILSON'S PLOVER*	*Charadrius wilsonia*	x	br	x	x/nb	x/nb	x/nb	x/nb	x/nb	x/nb	x/nb	no	x/nb	x/nb	x/nb	no	no	no	v
WILSON'S SNIPE	*Gallinago delicata*	br	br/nb	x	nb	nb	nb	nb	nb	v	nb	no	nb	no	no	no	no	no	no

Legend: x = resident species, br = breeding, nb = non-breeding, pa = passing, v = vagrant

Notes * These species have resident Neotropical sub-populations that do not interact with North American populations.

Appendix C. Shorebird species that require coordination within North America only

Common Name	*Scientific name*	Canada	USA	Mexico	Central America	Caribbean	Colombia	French Guiana	Guyana	Suriname	Venezuela	Bolivia	Ecuador	Peru	Brazil	Paraguay	Argentina	Uruguay	Chile
AMERICAN AVOCET	*Recurvirostra americana*	br/pa	br	x	nb	nb	v	no	no	no	v	no	v	no	no	no	no	no	no
AMERICAN OYSTERCATCHER*	*Haematopus palliatus*	br	br	x	x	x	x	nb	no	no	x	no	x	x	x	no	x	x	x
AMERICAN WOODCOCK	*Scolopax minor*	br	br	x	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
BLACK OYSTERCATCHER	*Haematopus bachmani*	br	br	x	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
BLACK TURNSTONE	*Arenaria melanocephala*	x	br	x	no	no	no	no	no	no	no	no	x	no	no	no	no	no	no
BLACK-NECKED STILT*	*Himantopus mexicanus*	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
HAWAIIAN STILT	*Himantopus mexicanus*	no	x	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
KILLDEER*	*Charadrius vociferus*	br	br	x	nb	br/nb	nb	v	no	no	nb	v	br/nb	x	v	no	no	no	x
LONG-BILLED CURLEW	*Numenius americanus*	br	br	nb	v/nb	v	nb	no	no	no	v	no	no	v	no	no	no	no	no
MOUNTAIN PLOVER	*Charadrius montanus*	br	x	x	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
PIPING PLOVER	*Charadrius melodus*	br/pa	br	nb	no	nb	no	no	no	no	no	no	v	no	v	no	no	no	no
RED PHALAROPE [1]	*Phalaropus fulicarius*	br/pa	br	nb	nb	v	nb	no	no	no	no	no	nb	nb	v	v	v	no	nb
RED-NECKED PHALAROPE [1]	*Phalaropus lobatus*	br/pa	br	v	nb	v	x	no	no	no	no	no	x	x	no	no	v	no	x
ROCK SANDPIPER	*Calidris ptilocnemis*	x	br	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no

Legend: x = resident species, br = breeding, nb = non-breeding, pa = passing, v = vagrant

Notes

* These species have resident Neotropical sub-populations that do not interact with North American populations.

[1] For both Red Phalarope and Red-necked Phalarope species, markings are difficult to read when staging offshore or wintering offshore; therefore they only require coordination on breeding grounds

Appendix D. Shorebird species that require coordination within South America only

Common Name	*Scientific name*	Canada	USA	Mexico	Central America	Caribbean	Colombia	French Guiana	Guyana	Suriname	Venezuela	Bolivia	Ecuador	Peru	Brazil	Paraguay	Argentina	Uruguay	Chile
CURLEW SANDPIPER	*Calidris ferruginea*	x	br	v	no	v	v	no	no	no	no	no	v	v	no	no	no	no	no
RED-NECKED STINT	*Calidris ruficollis*	v	br	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
ANDEAN AVOCET	*Recurvirostra andina*	no	no	no	no	no	no	no	no	no	no	x	no	x	no	no	x	no	x
ANDEAN LAPWING	*Vanellus resplendens*	no	no	no	no	no	x	no	no	no	no	x	x	x	no	no	x	no	x
ANDEAN SNIPE	*Gallinago jamesoni*	no	no	no	no	no	x	no	no	no	x	x	x	x	no	no	no	no	no
DIADEMED PLOVER	*Phegornis mitchellii*	no	no	no	no	no	no	no	no	no	no	x	no	x	no	no	x	no	x
GRAY-BREASTED SEEDSNIPE	*Thinocorus orbignyianus*	no	no	no	no	no	no	no	no	no	no	x	no	x	no	no	x	no	x
IMPERIAL SNIPE	*Gallinago imperialis*	no	no	no	no	no	x	no	no	no	no	no	x	x	no	no	no	no	no
LEAST SEEDSNIPE	*Thinocorus rumicivorus*	no	no	no	no	no	no	no	no	no	no	x	v	x	v	no	br/nb	nb	x
MAGELLANIC OYSTERCATCHER	*Haematopus leucopodus*	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	x	no	x
MAGELLANIC PLOVER	*Pluvianellus socialis*	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	x	no	x
NOBLE SNIPE	*Gallinago nobilis*	no	no	no	no	no	x	no	no	no	x	no	x	x	no	no	no	no	no
PERUVIAN THICK-KNEE	*Burhinus superciliaris*	no	no	no	no	no	no	no	no	no	no	no	x	x	no	no	no	no	x
PUNA PLOVER	*Charadrius alticola*	no	no	no	no	no	no	no	no	no	no	x	no	x	no	no	x	no	x
PUNA SNIPE	*Gallinago andina*	no	no	no	no	no	no	no	no	no	no	x	v	x	no	no	x	no	x
RUFOUS-BELLIED SEEDSNIPE	*Attagis gayi*	no	no	no	no	no	no	no	no	no	no	x	x	x	no	no	x	no	x
SNOWY SHEATHBILL	*Chionis albus*	no	no	no	no	no	no	no	no	no	no	no	no	no	v	no	br/nb	nb	br/nb
SOUTH AMERICAN PAINTED-SNIPE	*Nycticryphes semicollaris*	no	no	no	no	no	no	no	no	no	no	no	no	no	x	x	x	br	x
WHITE-BELLIED SEEDSNIPE	*Attagis malouinus*	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	x	no	x
BLACKISH OYSTERCATCHER	*Haematopus ater*	no	no	no	no	no	no	no	no	no	no	no	no	x	no	no	x	v	x
FUEGIAN SNIPE	*Gallinago stricklandii*	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	x	no	x
GIANT SNIPE	*Gallinago undulata*	no	no	no	no	no	x	x	x	x	x	br/nb	no	no	x	x	v	no	no
PIED LAPWING	*Vanellus cayanus*	no	no	no	no	v	x	v	x	x	x	x	x	x	x	x	v	no	no
RUFOUS-CHESTED DOTTEREL	*Charadrius modestus*	no	no	no	no	no	no	no	no	no	no	no	no	nb	nb	v	x	nb	x
SOUTH AMERICAN SNIPE	*Gallinago paraguaiae*	no	no	no	no	x	x	x	x	x	x	x	v	x	x	x	x	x	x
SOUTHERN LAPWING	*Vanellus chilensis*	no	no	v	x	x	x	v	x	x	x	x	x	x	x	x	x	x	x
TAWNY-THROATED DOTTEREL	*Oreopholus ruficollis*	no	no	no	no	no	no	no	no	no	no	x	v	br/nb	nb	no	x	nb	x
TWO-BANDED PLOVER	*Charadrius falklandicus*	no	no	no	no	no	no	no	no	no	no	no	no	no	x	no	x	x	x
WATTLED JACANA	*Jacana jacana*	no	no	no	x	x	x	x	x	x	x	x	x	x	x	x	x	x	v

Legend: x = resident species, br = breeding, nb = non-breeding, pa = passing, v = vagrant

Appendix E. Shorebird species not included in the PASP protocol

Common Name	*Scientific name*	Canada	USA	Mexico	Central America	Caribbean	Colombia	French Guiana	Guyana	Suriname	Venezuela	Bolivia	Ecuador	Peru	Brazil	Paraguay	Argentina	Uruguay	Chile	Coordination with international flyway
BLACK-TAILED GODWIT	*Limosa limosa*	v	v/nb	no	no	v	no	no	no	no	no	no	no	no	no	no	no	no	no	**no**
COMMON SANDPIPER	*Actitis hypoleucos*	no	v/nb	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	**no**
EURASIAN DOTTEREL	*Eudromias morinellus*	v/br	br	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	**all**
EURASIAN GOLDEN PLOVER	*Pluvialis apricaria*	v	v	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	**no**
EUROPEAN WOODCOCK	*Scolopax rusticola*	v	v	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	**no**
GRAY-TAILED TATTLER	*Heteroscelus brevipes*	no	v/nb	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	**no**
LESSER SAND PLOVER	*Charadrius mongolus*	v	nb	no	no	no	no	no	no	no	no	no	no	no	no	no	v	no	no	**EAAF W.Asia C.Asia**
LONG-TOED STINT	*Calidris subminuta*	no	nb	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	**no**
MARSH SANDPIPER	*Tringa stagnatilis*	no	v	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	**no**
NORTHERN LAPWING	*Vanellus vanellus*	no	v	no	no	v	no	no	no	no	no	no	no	no	no	no	no	no	no	**no**
PIN-TAILED SNIPE	*Gallinago stenura*	no	x	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	**no**
RUFF	*Philomachus pugnax*	v	v/br	v	no	v	v	v	no	no	v	no	no	v	v	no	no	no	no	**no**
SPOONBILL SANDPIPER	*Eurynorhynchus pygmeus*	v/nb	v/nb	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	**EAAF**
SWINHOE'S SNIPE	*Gallinago megala*	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	x	no	no	**no**
WOOD SANDPIPER	*Tringa glareola*	no	br	no	v/nb	no	no	no	no	no	no	no	v	no	no	no	no	no	no	**no**

Legend: x = resident species, br = breeding, nb = non-breeding, pa = passing, v = vagrant

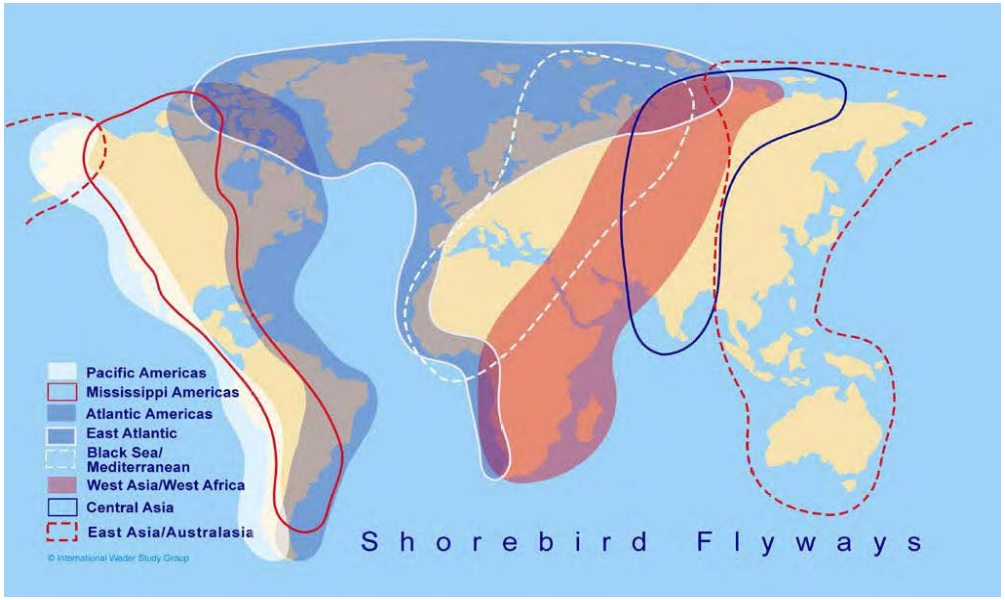
EAAF = East Asia/Australasia Flyway, W.Asia = West Asia/West Africa Flyway, C.Asia = Central Asia Flyway

Appendix F. Shorebird species that require coordination with international flyways

Common Name	*Scientific name*	Canada	USA	Mexico	Central America	Caribbean	Colombia	French Guiana	Guyana	Suriname	Venezuela	Bolivia	Ecuador	Peru	Brazil	Paraguay	Argentina	Uruguay	Chile	Coordination with international flyway
BAR-TAILED GODWIT	*Limosa lapponica*	x	br	v	no	no	no	v	no	no	v	no	v	no	v	no	no	no	no	**EAAF**
BRISTLE-THIGHED CURLEW	*Numenius tahitiensis*	no	br	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	v	**EAAF**
COMMON RINGED PLOVER	*Charadrius hiaticula*	br	v	no	no	v	no	no	no	no	no	no	no	no	no	no	no	no	no	**EA**
DUNLIN	*Calidris alpina*	pa	br	x	v/pa	v	v	v	no	no	v	no	v	v	no	v	no	no	no	**EA**
PACIFIC GOLDEN-PLOVER	*Pluvialis fulva*	x	br	x	no	v	no	no	no	no	no	no	v	no	no	no	no	no	v	**EAAF**
PURPLE SANDPIPER	*Calidris maritima*	b	nb	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	**EA**
RED KNOT	*Calidris canutus*	br/pa	br	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	**EA, EAAF**
RUDDY TURNSTONE	*Arenaria interpres*	br/pa	br	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	v	nb	nb	nb	**EA**
SANDERLING	*Calidris alba*	br/pa	br	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	nb	**EA**
SHARP-TAILED SANDPIPER	*Calidris acuminata*	v	x	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	**EAAF**

Legend: x = resident species, br = breeding, nb = non-breeding, pa = passing, v = vagrant
EA = East Atlantic Flyway, EAAF = East Asia/Australasia Flyway

Note: International shorebird flyways considered in this protocol were based on those described in the figure below.



Source: International Waders Study Group

Appendix G. PASP Contact List

PASP STEERING COMMITTEE			**Interim Co-Chairs** **Lesley Howes & Richard Johnston** E: Lesley.howes@canada.ca E: rjohnston@calidris.org.co	
REGION		**REGIONAL COORDINATORS**	**CONTACT INFORMATION**	
Canada (including St-Pierre et Miquelon)		Bird Banding Office (BBO)	www.ec.gc.ca/bbo	Louise Laurin T: 613-998-0524 E: bbo_cws@canada.ca
USA		Bird Banding Laboratory (BBL)	www.pwrc.usgs.gov/BBL	T:301-497-5790 E: BBL@usgs.gov
Mexico				
Central America		Rosabel Miró R.	www.facebook.com/audubonpanama	T: 507-232-5977 E: rosabelmiro01@gmail.com
Caribbean		Rozenn Le Scao	www.pnr-martinique.com	T: 059-664-4259 E:r.lescao@pnr-martinique.com
South America Black	Colombia			
	French Guyana	Groupe d'Étude et de Protection des Oiseaux en Guyane (GEPOG)	www.gepog.org	Nyls de Pracontal T: 05 94 29 46 96 E: nyls.depracontal@gepog.org
	Guyana			
	Suriname			
	Venezuela	Sociedad Conservacionista Audubon Venezuela	www.audubonvenezuela.org	Verónica Pacheco E: vpvarano@gmail.com
South America Yellow	Bolivia			
	Ecuador			
	Peru	Centro de Ornitología y Biodiversidad (CORBIDI)	www.corbidi.org	Eveling Tavera Fernandez T: (51-1) 3441701 E: etavera@corbidi.org
S. America Blue	Brazil	Centro Nacional De Pesquisa e Conserva Conservação de Aves Silvestres (CEMAVE/ICMBio)	www.icmbio.gov.br/cemave	T:(83) 3245-5001 / 3245-5278
	Paraguay			
S.America Orange	Argentina	Fundación Inalafquen	www.fundacioninalafquen.org.ar	T: 02934 422294 E: ccanutus@yahoo.com.ar
	Uruguay			
Chile				

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